Poster Session Proceedings

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Poster Chair:
Preston Byrd, Clemson University

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A total of 74 posters were received, 36 in the Innovative Idea category and 38 in the Research category. There were 30 Innovative Idea posters accepted (83% acceptance rate) and 27 Research posters accepted (71% acceptance rate).

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

Name	Institution
Anderson, Ryan	Sauk Valley Community College
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Claflin, Kellie	Oregon State University
Clement, Haley	Oregon State University
Colclasure, Blake	University of Florida
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Epps, Rebekah	The University of Kentucky

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Lindner, James	Texas A&M University
McCubbins, OP	Texas A&M University
McKim, Aaron	Michigan State University
Morgan, Joy	North Carolina State University
Murphrey, Theresa	Texas A&M University
Myers, Brian	University of Florida
Pauley, Catlin	Michigan State University
Peake, Jason	University of Georgia
Ramsey, Jon	Oklahoma State University
Rice, Laura	University of Kentucky
Roberts, Richie	Louisiana State University
Rucker, Jill	University of Arkansas
Saucier, Ryan	Sam Houston State University
Smith, Kasee	University of Idaho
Spiess, Michael	California State University, Chico
Stewart, Josh	Oregon State University
Warner, Wendy	North Carolina State University
Wells, Trent	Iowa State University
Williams, Robert	Texas A&M University - Commerce

Innovative Idea

A Bully-Free World	LaToya Browk, Donna J. Peterson, Alisha Hardman, Kirk A. Swortzel	Mississippi State University
A Novel Educational Experience: A Hybrid lab course In a Microbiology Major	Macarena Urrets-Zavalia; Sebastian Galindo-Gonzalez; Jennifer C Drew; Alexandria N Ardissone; Monika W Oli; Kelly C Rice, Associate; Eric W Triplett	University of Florida
Agricultural Mechanics for Non-Traditional Students	Natalie Kincy Ferand & Andrew C. Thoron	Univeristy of Florida
Agriscience Fair Jackpot: An Outreach Activity to Attract Science-minded Secondary Agriculture Students to an 1890 Land-grant University	John Ricketts	Tennessee State University
Agriscience Teacher Education Symposium	Debra Barry, Dr. Andrew Thoron	University of Florida
An Experiential Learning Approach to Improving Multicultural Education Among Preservice Teachers	Brett M. Wasden, Sarah Warren, & Stacy K. Vincent	University of Kentucky
Andragogical Lessons Learned from the Stockyards Beef Learning Series	Sarah Warren, Dr. Rebekah B. Epps	The University of Kentucky
Bridging the Mandate Gap: Creating an Innovative Online Platform to Guide Teachers in Supervising Foundational SAEs	Marshall A. Baker, J. Shane Robinson, Jon Ramsey	North Carolina State University
Building Agricultural Leadership Through Policy Explorations	Daniel Radford, Joy Morgan, Blake Brown	North Carolina State University
Community Supported Agriculture for Floral Design	Natalie Kincy Ferand & Andrew C. Thoron	Univeristy of Florida
Differentiating Teaching Philosophies	Jason Bullock, Susan Jones, Wendy J. Warner	North Carolina State University
Diffusing educational best practices adopted by Peace Corps volunteers to U.S. agricultural educators	Tegan Walker, James Lindner	Auburn University

Equine Vaccinations: A "Ready-made" Lesson for 4-H Youth	Sarah Bagley; Dr. Shane Robinson	University of Arkansas
Exploring My World: A Cultural Awareness Curriculum	Emily Cox, Julie Sexton, Kirk Swortzel, Tommy Phillips, and Susan Seal	Mississippi State University
Food and My Story: An Exercise in Diversity Consciousness	Cammie Weaver, Penny Pennington Weeks, William Weeks	Oklahoma State University
Georgia Agricultural Education Partners for Pollinators	Ashton Wheeless, Ami Harrington, Ashley Yopp, and Barry Croom	University of Georgia
Implementation of Video-Based STEM Curriculum Marketed Through Social Media	Haley Kinney, Kristin Knight, Hannah Branscum, Jeff Sallee	Oklahoma State University
Inclusion of Special Education Students in Agricultural Education Through Cooperative Learning	Bradley Coleman and J.C. Bunch	University of Florida
Let's Recap®: Using a Popular Smartphone Application to Facilitate Critical Reflection	Adam O'Malley, Olivia Soler, Richie Roberts, Kristin S. Stair	Louisiana State University
Professional Development for Sustainable Bioenery Educationopment	Katie Monroe, Beatrix Haggard, Marshall A. Baker, J. Shane Robinson, Jeff Sallee, and Gopal Kakani	Oklahoma State University
Project PLANTS: Planting Middle School Leaders in Agriscience	Rachel Berube, Elizabeth Driscoll, Elizabeth Overcash, Travis Park	North Carolina State University
Putting the "Pro" in Program: Facilitating Preservice Teachers' School-based Agricultural Education Program Development Competencies in a Youth Program Development Course	OP McCubbins, Trent Wells	Texas A&M University, Iowa State University
Students for Cultivating Change: Developing Safe Environments for LGBTQ+ Students	Jeremy Elliott-Engel; Chelsea Corkins; Joaquin (Ryan) Amaral; Donna Westfall-Rudd; Rick Rudd	Virginia Tech
Teach Ag Digital Escape Room	Kathryn L. Teixeira, Christopher J. Eck, Jessica M. Toombs, J. Shane Robinson	Oklahoma State University

The edTPA Planner: Providing a Roadmap for a High-Stakes Performance Assessment	Wendy J. Warner, Shelby Bireley Travis D. Park, Joy E. Morgan	North Carolina State University
The Impact of Social-Academic Experiences on In-Class Engagement	Jordan DeWitt, Chandler Mulvaney, and Nick Fuhrman	University of Georgia
Tools and Techniques for Revising a State Extension Performance Appraisal System for Extension Agents, County Directors, and Area Extension Specialists	Joseph L. Donaldson	North Carolina State University
Using 360 Video for Teaching Performance Reflection	OP McCubbins	Texas A&M University
Using a team-based online simulation to promote undergraduate student learning outcomes in a leadership course on groups and teams	Jonathan Orsini, Austin Council, and Nicole Stedman	University of Florida
Using Stories and Imagery to Impact Learning in a College of Agriculture	Diane Friend	Texas A&M University

Research

[State] Agriculture in the Classroom Program: Through the Lens of Educators	Jessica N. Smith, Carley C. Morrison, Michael E. Newman, & Julie B. White	Mississippi State University
A Qualitative Needs Assessment of [State] Urban Agriculturalists	Catherine E. Dobbins, Leslie D. Edgar, Casandra K. Cox, Donna L. Graham, Amanda P. Perez	University of Georgia; University of Arkansas
An Assessment of Agricultural Science Teachers' Knowledge of Biotechnology and Experience through Piloting New Biotechnology Curriculum	Tanya C. Franke-Dvorak, Sue E. Nokes	University of Kentucky
Completers of a Summer Residential Program for Agriculture: Where are They Now?	Abigail Hemby, Brittany Hoover, Jeremy Elliot-Engel, Curtis Friedel	Virginia Tech
Cultural Competence: How skilled are students across majors?	Candy Grant and Carla B. Jagger	Mississippi State University

Cultural Engagement Among Agriculture, Food and Life Science Honors Students	Isabel Whitehead, Casandra Cox, and K. Jill Rucker	University of Arkansas
Culturally Responsive Teaching: Experiences of underrepresented students	Christien Russell, Abbigail Petersen, and Carla B. Jagger	Mississippi State University
Development and Evaluation of a Variable-Frequency Drive Trainer for use in a University Agricultural Electricity Course	Colton Teekell, Patterson Hilaire, Donald Johnson	University of Arkansas
Do Teachers Need Support to Teach Students with Specific Learning Disabilities?	Kailee Morris, Catherine A. DiBenedetto	Clemson University
Echoes in the Void: Agriculturalists Perceptions of Communicating with Non-Agricultural Populations	Chris Clemons, James Lindner	Auburn University
Educational Feedback Formats: Student Perceptions in an Undergraduate Honors Research Course	Rachel Bechtold, Catherine Shoulders	University of Arkansas
Establishing Instrument Validity for the Professional Identity Scale in Agricultural Education: A Focus on the Educator's Professional Identity	Bradley D. Borges, Reagan J. Grubbs, Catherine W. Shoulders	University of Arkansas
Establishing Instrument Validity for the Professional Identity Scale in Agricultural Educators: A Focus on the Agriculturalist's Professional Identity	Mary Samoei & Catherine Shoulders	University of Arkansas
Extension's Role in Precision Agriculture: A Case Study of Auto-Steer Adoption in [state]	Patrick J. Poindexter, Annabelle Stokes, Laura L. Greenhaw	Mississippi State University
Faculty perspectives on and strategies for mentoring underrepresented minority students in research	Donna Westfall-Rudd, Hannah Scherer	Virginia Tech
Fostering Academic Success for University Agriculture Students: The Role of Social Self-Efficacy on First-Year Grade Point Average	Morgan A. Richardson, Whitney L. Figland, Adam O'Malley, Olivia Soler, Kristin S. Stair, Richie Roberts, J. Joey Blackburn	Louisiana State University

Is 'Rural' a Risk Factor for Freshmen-to-Sophomore Non-Retention in a College of Agriculture?	Isabel Whitehead, Donald Johnson, Kate Shoulders, Leslie Edgar	University of Arkansas
Poultry Labeling: Knowledge and Perceptions among Adolescents	Eleni Parsons, K. Jill Rucker, Leslie D. Edgar, M. Betsy Garrison, & Casandra Cox	University of Arkansas
Ringing the Schoolhouse Bell: Identifying Competencies, Attitudes and Perceptions of Teacher Success and Longevity	Tegan Walker, Chris Clemons, James Lindner	Auburn University
Risk and Dread Perceptions of Secondary Agricultural Student: An Exploratory Study Using the Psychometric Paradigm	Brett Wasden, Stacy K. Vincent, & Mason Tate	University of Kentucky
Teaching Enhancement through Agricultural Laboratories Workshop: Effects on Self-Efficacy towards and Intent to Teach Simulated Laboratories	Reagan J. Grubbs, Donald M. Johnson, Catherine W. Shoulders, Donna L. Graham, George Wardlow	University of Arkansas
The Benefits of Student-Created Plant Identification Notebooks	Tristen Brooke Johnson, Summer Lee Taylor, Stephen Wyatt Edwards	University of Mount Olive
The Effect of a Teaching in a Laboratory Setting Course on Pre-Service Teacher Self-Efficacy	Brianna N. Shanholtzer & Andrew C. Thoron	University of Florida
The Role of Living-Learning Communities and University Agriculture Students' Retention	Olivia Soler, Adam O'Malley, Whitney L. Figland, Morgan A. Richardson, Kristin S. Stair, Richie Roberts, J. Joey Blackburn	Louisiana State University
Victory Gardens: Significance to 4-H, Cooperative Extension, and Agricultural Education	Emma Cannon, Barbara Kirby, Joy Morgan	NC State University
What Effect Does an Encouraging Email Have on Motivating Students for a Course Before the Semester Starts?	Lauren Lewis Cline; Dr. J. Shane Robinson	Oklahoma State University
What Factors Influence College Students' Proficiency for Career Readiness?	Victoria C. Willis, Catherine A. DiBenedetto, Michael Vassalos	Clemson University

A Bully-Free World

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A Bully-Free World

Introduction

Bullying is repeated, unwanted, and aggressive behavior among school aged children (USDHHS, 2017). Recent national statistics indicate that 28% of U.S. students in the 6th -12th grade experience bullying, 30% bully others, 70.6% have seen bullying at school, and 9% experience cyberbullying (USDHHS, 2017). Additionally, 70.4% of school staff have seen bullying (USDHHS, 2017). Johannes and Hardman (2007) reported that out of 1,500 internet-using teens, 34% were victims of online bullying, and 16% admitted to cyberbullying others. Victims of bullying were most commonly females, individuals of the black race (not Hispanic or Latino ethnicity), and 6th graders (Lessne & Yanez, 2016).

Victims who are bullied may show psychological distress, poor social adjustment, and isolation (Young, Hardy, Hamilton, Biernesser, Sun, & Niebergall, 2009). Richard, Schneider, and Mallet (2011) discussed that students who experienced bullying reported greater social problems, academic anxiety, impulsivity, and friendship conflict. Middle school students reported that the bullying experience caused negative feelings about self and appearance. Victims may also avoid specific places at school to avoid being bullied. Being a victim of bullying could eventually lead to suicide.

Youth who bullied others were more likely to abuse alcohol, use other drugs, get into fights, vandalize property, drop out of school, engage in early sexual activity, have criminal convictions, receive traffic citations as adults, and abuse other partners, spouses, or children as adults (USDHHS, 2017). However, there were several ways that parents or adults could help children cope with bullying. Some of the ways were to avoid the bully, use the buddy system, ease anger by using relaxation techniques, walk away/ignore, tell an adult, and talk about it (Kids Health, 2018).

Bullying is a major problem and concern for Mississippi. Approximately 93,600 school age children in Mississippi per year were involved in a bullying situation (High, 2000). This included victims of bullying (43,284), those who were both victims and who bully others (9,034), and children who only bully (41,282). To help reduce the consequences of bullying, youth need to learn about and practice different bullying coping strategies. A bullying prevention education program for students engaged in bullying behaviors could help them to see the severity of the problem.

How it works

A curriculum, *A Bully-Free World*, was developed for 6th graders who engaged in bullying behaviors at a middle school in Mississippi. Through this curriculum, participants learned about the different forms of bullying, the effects of bullying, ways to cope with anger, and bystander intervention. Sixth graders who participated consisted of multiple races, both genders, and had been involved in bullying situations. The program consisted of: (1) contacting the school explaining the bullying education program; (2) communicating with the school counselor to identify 10 participants; (3) developing bullying curriculum (6 sessions, 6 days); (4) delivering the program twice a week (50 minutes for each session, for 3 weeks); (5) conducting process evaluation (participant satisfaction survey, observation of implementation, fidelity checklist); and (6) conducting outcome evaluation using a pre/posttest survey after each session.

Results to date

Pre- and posttest quantitative data from the Bully-Free World program was analyzed to see if the program made a difference in understanding the effects of bullying. For *Session I*, 9 of 10 participants answered correctly the items on the pretest, indicating participants already had knowledge on these items before the program started. However, while only 2 participants knew that bullying mostly happens to youth who are age 12 – 18 years at pretest, all 10 knew this at posttest. For *Session II*, 5 of the 7 participants knew what verbal and social (relational) bullying meant before the program, and all 7 knew the definitions of physical bullying and cyberbullying. However, all 7 participants answered all the questions correctly on the posttest. For *Session III*, all 9 of the participants answered the questions on the social effects of bullying correctly on the pretest/posttest. Also on the pretest, 7 of the 9 participants answered questions regarding the physical and emotional effects of bullying correctly. The knowledge level about physical and emotional effects of bullying improved on the posttest. For *Session IV*, 8 of the 9 participants had a good understanding about anger coping strategies before and after the program. For *Session V*, 8 participants knew that they could intervene in a bullying situation, could tell an adult if someone being bullied, and could report a bullying incident on the pretest. The posttest showed that all participants' knowledge about bystander intervention improved after the session except for one item, "Never distract a bully." For *Session VI*, 7 of the 10 participants answered 2 questions correctly on the pretest. On the posttest, 9 to 10 out of the 10 participants answered all questions correctly. Overall, all participants were satisfied with the program.

Future plans

A Bully Free World was effective at increasing knowledge about bullying. Since many participants answered questions correctly at pretest, there may be other topics that could be added to the curriculum. Talking with the students about what they still wanted to know about bullying could provide suggestions for these additional topics. Piloting the program and reviewing the evaluation data allowed the Extension agent to consider other changes that could enhance the program's success. The Extension agent could implement the program throughout the year to other 6th grade students that may benefit from the program. Since only 10 students participated in the pilot, there could be other students at the school who have been a victim of bullying but have not reported it. Other Extension agents could pilot the curriculum in their own counties to teach middle school 4-Hers, youth in the community, or at local middle schools in the county. When the curriculum has been demonstrated to be successful through more rigorous evaluation, this program could be expanded across the state.

Costs

The following are the expense that were incurred in developing the program: direct costs included a Laptop ($300), Flip chart ($15.98), Expo markers 4 pk ($3.37), Pencils Pre-sharpened 30 ct ($5.97), Copy paper 1 pk ($3.68), Printer ($34.00), and Printer ink black ($18.89) for total direct costs of = $381.89; Indirect costs including securing the classroom. The development of this project took approximately 6 months/480 hrs. (80 hrs per month x 6 mo. = 480 hrs.) to write, organize (journals & internet sources), develop, implement, and analyze the data collected in this program.

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A Novel Educational Experience: A Hybrid lab course In a Microbiology Major

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A Novel Educational Experience: A Hybrid lab course In a Microbiology Major

Introduction

In 2012, a report made to the President of the United States by the President's Council of Advisors on Science and Technology suggested that, in order to maintain the current position of preeminence in science and technology, one million more STEM graduates will be needed (President Council of Advisors on Science and Technology, 2012).

To accomplish the goal of increasing the number of STEM graduates, providing opportunities to diverse demographics became paramount. As stated by Drew, et al., (2016) the need to broaden the participation of underrepresented minorities in STEM is more than evident. Likewise, for the National Science Board of NSF, diversity is one of America's best advantages regarding competitiveness in STEM (NSF, 2018). Considering diversity as an advantage is important for universities to provide equal opportunities to different demographics.

Concurrently, during the past decade, online education has grown exponentially. In 2008, Allen and Seaman released a key report on higher education and online education in the USA. The report documented the shift that higher education had experienced in the past decade towards online education (Allen & Seaman, 2008). According to a newer report also released by Allen and Seaman, in 2012, more than 6.7 million of students were enrolled in distance education programs (Allen & Seaman, 2012).

In those circumstances, with a higher demand for online education and following the suggestion made by the President's Council of Advisors on Science and Technology, the Department of Microbiology implemented, in the year 2011 a unique hybrid transfer program.

The implementation resulted on the need of making all the face-to-face courses also available for online delivery. However, due to the importance of a hands-on experience in a lab setting, the laboratory courses could not be delivered online. Hybrid condensed lab experiences were then implemented as an answer to this challenge. A commonly asked question for online programs, particularly relevant for some STEM disciplines, is 'How effective a program can be with so little hands-on learning opportunities for students?' (Elliott & Kukula, 2007).

How it works/methodology/program phases/steps

Two traditional semester-long lab courses were condensed into 5–day, intensive "bootcamp" versions taught on the main campus. The condensed lab courses have the same objectives, activities, skills, and assessments as their semester-long versions.

Before taking the condensed lab, the students complete an online, semester long, one credit course. That online class teaches them the basic concepts they will need to be able to work in a lab.

The summer following to completing the online course, the students can take the condensed laboratory courses. Each lab lasts five days with students attending class from 8:00

am to 5:00 pm. The students can either take both lab sessions back to back in the same year (basic and advanced) or in separate years, depending on the students' personal constraints and/or preferences. The courses are offered during the second and third week of May (during the break between spring and summer semester).

Condensed courses of this kind can be of help in emphasizing decision making and strategic thinking in students, given their similarity to real-life situations (Shaw, Chametzky, Burrus, & Walters, 2013; Vale, et.al. 2012).

Results

Quantitative and qualitative approaches were used to develop a comprehensive evaluation of the quality and effectiveness of the condensed labs.

The team delivering the condensed labs compared the students' outcomes between the traditional and the condensed labs. So far, no significant differences in course grades or GPA have been found. Additionally, the changes in knowledge from both formats are similar. Furthermore, focus group interviews were conducted with condensed lab' students, and the data show that students found the experience to be very valuable. Students reported enhanced knowledge and found the condensed labs challenging but more motivating and potentially more effective than a traditional lab (as compared against their previous experiences).

Future plans/advice to others

The results of this experience are, so far, very positive and show that the innovative approach used for delivering the lab course in a time restricted environment was successful and could lead new and more effective delivery ways for hands-on training in STEM education.

A new study will be conducted next year to make a more rigorous comparison of the traditional and. the condensed labs looking at students' knowledge gain, retention of content, and ability to apply the content. The study will also utilize Bloom's taxonomy to compare the cognitive outcomes exhibited by students that completed either the semester-long lab or the condensed lab.

Resources needed

The resources needed for implementing a condensed version of a course will vary between institutions. In the case of Microbiology, the professors teaching in the summer are the same that teach in the other semesters, in addition, all the lab equipment was already available to the department.

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Agricultural Mechanics for Non-Traditional Students

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Introduction

Agricultural Mechanics programs have "traditionally been a cornerstone in the secondary [School Based Agricultural Education (SBAE)] program" (Burris, Robinson, & Terry, 2005, p. 23) with enrollment in these programs at an all time high (Missouri Department of Elementary and Secondary Education (DESE), 2018). Tummons, Langley, Reed, and Paul (2017) noted that agricultural mechanics instruction provided a place for students to learn legitimate career skills in a supervised and protected learning environment. However, DESE (2018) found that 42% of students enrolled in a SBAE programs are female, only eight percent of those female students showed an interest in agricultural mechanics. In Texas, four year-long courses have a focus in agricultural mechanics subjects with 51,975 students enrolled in the courses across the state (Texas Education Agency, 2018). Overall, females comprise 43% of students in agricultural education classrooms (Texas FFA Annual Report to NFFA, 2018). Numerous studies indicated the benefits of agricultural mechanics in relation to the development of high order thinking skills, scientific inquiry, application, problem solving, and facilitative instruction (Baker, Thoron, Myers, & Cody, 2008; Osborne & Dyer, 2000; Parr, Edwards, & Leising, 2009), a majority of female students are missing out on these valuable learning opportunities. This leads to a need for consideration on how to motivate female students to enroll in agricultural mechanics courses to obtain these values hands-on career skills. This innovative idea program addresses Research Priority 2, *"New Technologies, Practices, and Products Adoption Decisions"* (Lindner, Rodriguez, Strong, Jones, & Layfield, 2016, p.19).

How it Works

Athens High School (AHS) is located in rural Athens, Texas with an overall enrollment of 969 students. AHS SBAE is offered through a three-teacher program with an average of 12 courses taught annually. Four courses are the agricultural mechanics courses offered throughout the entire state of Texas. Two hundred thirteen students were enrolled in SBAE for the 2017-2018 school year at AHS. Historically, around 30% of students in SBAE at AHS were enrolled in at least one of the agricultural mechanics classes offered with the Power, Structure, and Technical (PST) systems pathway. The PST pathway is the second most popular for SBAE students at AHS behind Animal Science. However, despite a 60% overall female enrollment in SBAE classes at AHS, there has only been up to one female student enrolled in an agricultural mechanics class and only three current female students overall declaring the PST pathway. In an effort to better understand and cater to AHS students, the idea was proposed to offer Agricultural Mechanics and Metal Technology for Non-Traditional students, specifically females. This class was to be taught by the female teacher in the three-teacher program. Eleven students enrolled in the class for the 2017- 2018 school year. Students were given a pre-assessment to gauge their previous interest and knowledge level of various aspects of the agricultural mechanics course work. It was found that while a few of the students has previous experience with various aspects of agricultural mechanics, none choose to participate in these activities for fun and overall they displayed a low belief in their skills in these subjects. The class was taught in line with Texas Essential Knowledge and Skill (TKES) standards in the same agricultural mechanics laboratory as the other class. However, this class was taught at a time when no other classes would be sharing the laboratory as several of the students expressed a frustration with the commentary and critique of their male counterparts. All eleven students completed the course.

Results and Implications

All students who completed the Non-Traditional class expressed and displayed a high level of self-efficacy in their work in the agricultural mechanics laboratory, as well as an overall

comfort while using and being amongst the machinery. One student applied to a local junior college and was admitted in to their Welding Technology program with aspirations of becoming a Pipeline Technician. While five of the elven students were seniors and not able to enroll in a subsequent agricultural mechanics class, two of the six remaining students enrolled in Agricultural Structure and Design, the next class in the agricultural mechanics pathway. These two students have continued to display high levels of knowledge and competence in the agricultural mechanics lab. They have expressed they feel more confident in the laboratory and are often their first ones in the lab and the last ones to leave. While is it an improvement to year prior to the Non-Traditional class, only two more female students have chosen to start in the PST pathway with the Agricultural Mechanics and Metal Technology course. It is also important to recognize the importance of peers in students' self-efficacy due to model similarity. When students are unfamiliar with a task, or in this case the agricultural mechanics subject matter, learning with peers on a similar level, modeling their behaviors, and receiving positive reinforcement for their behavior all lead to higher self-efficacy (Pajares and Schunk, 2001). Female students in prior agricultural mechanics classes at AHS reported a low confidence in their skills and were not supposed by their male classmates. Bond, Cohen, and Sampson (1999) asserted some students learn better in collective forms of learning with students of like demographics rather than in traditional classroom settings.

Future Plans

AHS would like to utilize a similar course in the future, however they are currently without a female teacher willing to teach the course. As found in Tummons et. al (2018), there is a need for more pre-service training in agricultural mechanics for teachers. Additionally, more buy-in is needed from administration, but mostly counselors who advise students during enrollment. Wheelus (2009) found that counselors have the greatest impact on classes high school students enroll in. Additionally, counselors have a tendency to advise students on course selection based on overall course popularity, but also in line with the counselor's own preference on what classes the student should take. Without buy-in from key stake holders, such as counselors, that all classes should be available and advertised equally to all students, a decline in the number of female students in agricultural education classes might continue to see a decline. In addition, more research should be done on the overall implications of teacher gender demographics of teaching efficacy across various SBAE subject area. This sentiment was also noted by Langley, Kitchel, & Schumacher (2014, as cited in Tummons, et. al, 2017). Research is also needed into the exact number of female students enrolled across various SBAE subject areas have a better understanding of where students are are being served, but also underserved. Lastly, research int o the possible benefits of collective forms of learning with like peers to further support the link between similarity modeling and self-efficacy.

Resources Needed

There were not direct cost associated with this course as AHS had an existing agricultural mechanics laboratory. Even when a school is able to provide an agricultural mechanics laboratory, many teachers do not report a high level of teaching efficacy in the array of content necessary to cover all of agricultural mechanics, but more specifically female agriculture education teachers (Tummons et. al, 2017). Additionally, support from administration and counselors is necessary to student enrollment in agricultural mechanics classes, but most importantly for non-traditional students.

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Agriscience Fair Jackpot: An Outreach Activity to Attract Science-minded Secondary Agriculture Students to an 1890 Land-grant University

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Agriscience Fair Jackpot: An Outreach Activity to Attract Science-minded Secondary Agriculture Students to an 1890 Land-grant University

Introduction/need for innovation or idea

The College of Agriculture at Tennessee State University (TSU) has multiplied on almost every useful metric in the past 8 years; be it student enrollment, research funding, or extension education. Master's student enrollment in Agricultural Sciences, Ph.D. student enrollment, and counties with Extension faculty have all increased substantially. At a fundamental level, TSU has integrated academics with research and Extension; established faculty focus groups to provide intellectual leadership to programs; and created new opportunities for students to get involved in research and outreach. TSU has added numerous faculty and increased partnerships in the state and around the world. However, undergraduate student enrollment is suffering.

To bolster undergraduate enrollment, the College of Agriculture is searching for different ways to play to our strengths as a scholarly community with state-of-the-art research programs staffed with world-class faculty and student capacity. Based on the growing popularity of livestock exhibition jackpots where students compete for cash awards for their animal projects, the TSU College of Agriculture Recruitment Committee hypothesized that a great way to introduce students to our expertise, resources, and talent, and to hopefully attract them to our program was to create an *Agriscience Fair Jackpot*.

Students who love science, would be immersed at a science-heavy College of Agriculture with faculty who are as engaged in STEM as they are. This method of student recruitment seemed to be in line with research findings suggesting that students' academic aspirations were associated with enrollment decisions (Chapman, 1981; Hossler & Gallagher, 1987; Kinzie et al., 2004). Image is also important to college choice, and the committee believed that prospective students would be more likely to enroll (Pampaloni, 2010) if they experienced all we had to offer by visiting campus. Lastly, as mentioned above, the concept of a Jackpot isn't new to agricultural education. Given the competitive nature of agricultural education students and the popularity of jackpots and the Agriscience fair in Tennessee, the innovative idea for an Agriscience Fair Jackpot became a reality.

How it works/methodology/program phases/steps

High school students in 9th through 12th grade were invited to facilities at the TSU farm for an agriscience fair competition with cash prizes and other financial incentives. The Tennessee FFA Advisors and the Tennessee 4-H listservs were utilized for recruitment, and personal contacts were made to stakeholder educational leaders in the Metropolitan Nashville Public Schools. Categories students competed in represented a combination of traditional areas commonly found in the state and national Agriscience Fair with FFA and the concentrations/majors in the College of Agriculture at TSU. The categories were: Animal Sciences, Food & Nutrition Sciences, Environmental Sciences & Natural Resources, Plant Sciences, Agricultural Engineering, and Social Sciences (Ag Ed, Ag Bus, Family Sciences). Using the Tennessee FFA Agriscience Fair rubric, TSU faculty judged projects matching their expertise by interviewing students, and then placing first, second, and third place stickers on the posters at the end of the competition.

Students competed for the following prizes at the Agriscience Fair Jackpot. The first-place project in each of the categories above received $500. The second-place project received $250. Students awarded one of the top two projects in each category were promised a seat in the prestigious Summer Apprenticeship Program, a $1,000 value. The top two students in each category were awarded a Dean's Scholar Internship, a research-based internship that helps students graduate from college debt-free. To receive the Dean's Scholar Internship incentive, students must major in the College of Agriculture and meet certain program eligibility standards. The school with the most student participation received an award too. All participants who registered and presented their research at the jackpot received a t-shirt. Winners were recognized at an awards program immediately following student presentations and judges' final decisions.

Results to date/implications

In the first year we had 92 participants and 74 research projects. The majority of participants were in the 10^{th} grade (34%), followed by those in the 9^{th} (31%), 11^{th} (23%), and 12^{th} (12%) grades. The largest category was Animal Science with 16 (22%) projects, followed by Environmental and Natural Resources Sciences (19%), Plant Sciences (18%), Social Sciences (15%), Food and Nutritional Sciences (14%), Agricultural Engineering (12%), and Biotechnology (1%). Teachers and parents have commented that the jackpot was very well done, exceedingly better than the agriscience fair at the state FFA convention. Students enjoyed having faculty judges who were actually experts in the fields they were researching. Students who had never been to campus were all of sudden asking questions about the potential of them studying at TSU. Faculty members, not normally exposed to secondary agriculture students, were very impressed with the students, and they developed a new awareness of what secondary agriscience produces.

Future plans/advice to others

Following a successful event and lots of positive feedback, there was a snag in getting students their real check in a timely manner. For the 2019 jackpot, we plan to have debit cards already on hand for the prize money. The first rendition of the jackpot was mostly FFA members, and we want to ensure that 4-H participants and homeschool students are also engaged so we will be reaching out to Extension agents and homeschool organizations with an agriscience fair workshop and information about the event. We will also collect data in the next round judging their perceptions of TSU Agriculture as a college choice following the event.

Costs/resources needed

The first resource that is needed for this event is space and facilities. For the inaugural event, 6,000 square foot of space in two buildings was maximized, so the event is being moved to the main campus where nearly every available corridor in the College of Agriculture will be utilized. The second important resource is people power. Nearly 40 faculty and college students were needed to carry out authentic judging and needed administration. Over $5,000 in cash prizes were given out, and approximately $500 was stretched for supermarket-catered snacks.

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Agriscience Teacher Education Symposium

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Agriscience Teacher Education Symposium

Introduction

Students majoring in Agricultural Education and Communication, with a specialization in Agricultural Education, are enrolled in coursework that integrates the many facets of agricultural education and their future career as an agriscience teacher and FFA Advisor. The Agriscience Teacher Education Symposium was designed to supplement department coursework, as well as to provide an opportunity for the 50+ students who are located on the main campus in Gainesville, Florida, as well as a distance program in Plant City, Florida a chance to interact and network as future colleagues. The symposium was originally designed to elaborate on course topics and areas, and has developed into an event with a major overlying theme. By enhancing the skillset, as well as the beliefs and attitudes of students that they have the necessary background and experiences to be an agricultural educator, we are one step closer to helping them find success in the classroom. Teaching efficacy has been found to play a huge role in the retention of a teacher in education (Stripling, C., Ricketts, J.C., Roberts, T.G., & Harlin, J.F., 2008). In alignment with Standards 1 and 2 of the National Standards for Teacher Education in Agriculture, the symposium works to develop experience-based knowledge , as well as a balanced teacher preparation program that includes "general education, technical content, and pedagogical and professional studies" (American Association for Agricultural Education, 2001, pgs. 1-4)

Steps

For the first symposium in 2017, funding was requested through an instructional improvement grant in the College of Agricultural and Life Sciences (CALS). Although the funding was not secured for the first year, plans went forward for the event, and the venue changed from an FFA Leadership Training Center (LTC) to the University of Florida Plant City Center. In the second year, the symposium successfully obtained funding to meet the goals of the program. Below outlines the steps that were followed:

1. February-March 2018: Identify potential funding that best fits programmatic needs, and work with peer AEC faculty to complete the funding request.
2. After developing topics and program focus for the symposium, submit application for a CALS Instructional Enhancement Improvement Grant by the March 2018 deadline.
3. AEC faculty worked together to include the program on their prospective fall course agendas for Fall 2018, after learning in April 2018 that funding was successfully secured through a CALS Instructional Improvement Grant.
4. With funding in place, the symposium was then scheduled at the FFA LTC.
5. After securing a date, the agenda was further developed by AEC faculty to include program visits, speakers and hands-on activities.

6. The next step, was ordering symposium materials, including folders and pens.
7. All purchase orders were submitted by June 2018 for costs associated with event activities and materials.
8. July-August 2018: Programs and guest presenters were organized and confirmed. Florida Nursery Growers and Landscape Association representatives and Dr. Grady Roberts were confirmed as workshop presenters.
9. September 2018: Participation was confirmed for all students, so that final rooming and dietary needs could be submitted to the LTC Staff.
10. September-October 2018: Workshop supply materials were communicated and confirmed with symposium partners and LTC staff.
11. October 2018: Workshop and agenda details were communicated with all AEC faculty & students.

Results to Date

The 2017 symposium hosted over 55 undergraduate AEC majors and faculty from Gainesville and Plant City. Six speakers presented on topics relating to ESE/ESOL, Growth Mindset, using the Agricultural Education Tracker (AET) program, the Florida FFA, Florida FFA Alumni, and a Veterinary Assisting Program overview.

The 2018 symposium was constructed to include program visits, as well as hands-on service learning opportunities to enhance both the technical skills of students, as well as the Florida FFA LTC facilities. 51 AEC undergraduate and graduate students, as well as AEC faculty participated in the symposium activities, which included visits to a central Florida Agriscience Program, a Technical College and a review of six of the programs, a research poster presentation, and workshops focused on building technical skills in woodworking and landscape design/installation.

Future Plans

In the future, the symposium may include a broader range of program visits, as well as other focus areas that will help develop technical content knowledge and pedagogy. Funding sources may change, but this program has been successful and should remain an annual event.

Cost/Resources Needed

- Meals (1 Breakfast, 2 Lunches, 1 Dinner), 1 night lodging & Conference facilities for up to 65 people: $4, 225.00
- Pens/Folders: $262.50
- Gas for faculty, graduate assistants, and staff: $250.00

Total & CALS Instructional Improvement Award Budget: **$4,787.50**

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An Experiential Learning Approach to Improving Multicultural Education Among Preservice Teachers

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An Experiential Learning Approach to Improving Multicultural Education Among Preservice Teachers

Introduction/Need for Innovation or Idea

In the midst of educational reform, the need for secondary teachers who are culturally relevant could be considered greater today than ever before. According to the Johnson (2012), like urban populations, rural communities are becoming more ethnically and culturally diverse. As these trends continue to grow, so is the need for teachers who can showcase a culturally relevant philosophy (Spring, 2007).

Educational research attributed to the presence of culturally competent teachers resulted in an increase of school districts seeking teachers with such skillsets. In two parallel studies conducted by Doherty, Hilberg, Pinal, and Tharp (2003), student achievement on standardized assessments improved when teachers modified their lessons in order to connect to students' lives. In 1995, Sheets found that students considered remedial learners in a secondary school received passing grades in their AP courses after teachers implemented culturally relevant instruction. Higher academic achievement and higher academic standards were recorded among schools identified as having multiple engagements that prepared teachers for diverse cultures (Bazron, Osher, & Fleischman, 2005).

Methodology

Preservice Agricultural Education students at the University of [STATE] enroll in a multicultural education, primarily during the first semester of their academic year. Prior to the start of the fall semester, the authors established a partnership from a middle school that included a school-based agricultural education instructor. The school enrollment reflected a high ethnic minority enrollment demographic: 37% Hispanic, 34% African America, 21% White, 4% Asian, and 4% other. Additionally, 66% of students qualify for free and/or reduced lunch with 15% of the students identified as *English as a Second Language* (ESL). Preservice teachers created, under the discretion of the acting middle school agriculture teacher, five agriculture content units with connections to Core Content Standards. A team of four preservice teachers enrolled in the multicultural agricultural education course taught each unit. Each team member attended his or her class, a minimum of, three times. The teams of preservice teachers met voluntarily to design their curriculum and establish engaging techniques that met the standards of Culturally Responsive Teaching (Gay, 2010). The teams decided to teach units, as assigned by grade levels as: a) 6^{th} grade - global agriculture, professionalism, and small animal care; b) 7^{th} grade - sustainable food production, marketing, environmental science, and agriscience; and c) 8^{th} grade - advocacy, public speaking, agricultural biotechnology, and agriscience.

Preparation in understanding the dynamic of cultural differences and Culturally Responsive Teaching began at the beginning of the academic semester (mid-August). The assignment occurred one month later (mid-September). Prior to teaching, the teams of preservice teachers received feedback regarding their lesson plans and were allowed to resubmit as needed. During the first month of instruction, the preservice teachers' responsibilities were threefold: (1) each student was required to teach a lesson; (2) assist in team teaching for a group member's lesson; and (3) host a recognition ceremony for students and distribute completion certificates. Reflection served as the key component in this experience. Students completed an intrapersonal reflection immediately after they delivered their lesson, debriefed the experience one-on-one with University observers, completed a self-evaluation for grading purposes, submitted a graded

written reflection, and engaged in an interpersonal reflection through class discussion, the immediately following day in the course.

Results to Date/Implications

The preservice teachers were exposed to educational strategies, pedagogy, methodology, and philosophy for diverse populations through this multicultural immersion that strengthened their skillset for the school's student demographic. Critical inclusivity of diverse student populations and increased cultural awareness of student demographics could be improved in preservice agricultural educators through this experiential learning project. Additionally, the quality of discussions improved regarding the methodological strategies in multicultural education between students, graduate teaching assistants, and professor. The preservice teachers were able to apply theories and methodologies learned during lectures, giving them an experience that led to growth in personal pedagogy and philosophy. Based upon class discussion, laboratory assignments, teaching reflections, and individualized projects, stronger connections to content and its application to teaching underserved youth. The preservice teachers noticed struggles in behavior management and identified bias for professional growth planning.

Future Plans/Advice to Others

Following the implementation, the authors determined that the success of this experiential learning approach will result in similar experiences being used again in coming years to enhance the curriculum for preservice agriculture teachers in the multicultural education course. Specifically, future implementation will include an additional observation for preservice educators to complete before creating their lesson plans for the project. An additional observation may better prepare preservice educators in lesson planning and increase relationships between preservice educators and secondary students. This project may be a sensitive methodological technique to employ and requires the comprehensive understanding of multicultural teacher educators. Teacher educators should meet in order to establish methodological strategies that foster growth rather than stress in preservice educators prior to the commencement of this project.

Cost/Resources Needed

Expenses for the program were minimal. Preservice teachers had full access to reusable and disposable teaching materials from the department; yet, some decided to purchase basic supplies for their lessons. At the completion of the units taught, a certificate ceremony occurred where the students were treated with hors d'oeurves and punch. The primary expense for the each middle school class's certificate ceremony included food, certificates, program and university branded gift (~$350).

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Andragogical Lessons Learned from the Stockyards Beef Learning Series

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Introduction

According to the American Farm Bureau, Americans are at least three generations removed from the farm, with less than 2% of the population actively involved in farming (American Farm Bureau Federation, n.d.). Agricultural literacy for the US population is essential to maintaining the validity of our industry amidst false accusations, food security concerns, and a disconnect from the production process. In addition, we need not forget the 2% of the population still actively involved in food production, who must stay on top of current trends, topics, and new research as they attempt to keep up with our ever-changing technological society. Our industry has historically placed value on educating citizens of all ages on agricultural topics, with the Smith-Lever Act of 1914 establishing the cooperative extension service for disseminating information to farmers and communities (USDA NIFA, n.d.) and the Smith-Hughes Act of 1917 creating School-Based Agricultural Education (SBAE) programs for high school students (FFA, n.d.).

Due to the nature of the Agricultural Education degree, it is likely for a graduate of a collegiate program in the area to find themselves capable of working either in the extension service or the SBAE setting. Therefore, it is crucial for teacher preparation programs in our unique subfield of education provide our pre-service teachers with the skills to educate in both pedagogical and andragogical settings. One teacher preparation program in Kentucky partnered with their local Beef Council to provide pre-service educators with the opportunity to teach lessons about the beef industry to the general public, agricultural organizations, and local beef producers in an educational series at the local stockyards. Specifically, this facility has a unique learning space called the YARDS (Youth, Advocacy, Research, Demonstration, and Sustainability), which is a classroom within the facility designed to maximize public exposure and education of the beef industry (Kentucky Regional Marketplace, 2017). Pre-service educators were expected to design a lesson tailored to this particular audience based on their needs, such as updates on beef industry trends and technologies. This Beef Learning Series provided pre-service teachers the opportunity to hone methods of andragogy, while creating partnership and professional networking opportunities within the local beef industry. This innovative 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

The YARDS facility was established in 2017 by a University of Kentucky Agricultural Education graduate with a passion for the beef industry, with support from the Kentucky Cattlemen's Association and Beef Council. Since its inception, a professor within the Agricultural Education program has included an assignment within the senior-level Methods of Teaching course that requires pre-service educators to: design and present a lesson on a topic within the beef industry, to an unknown audience of community members and local producers, using andragogical techniques. Students are given the assignment on the first day of the course, and are presented with a lecture and training about andragogy one month prior to the Beef Learning Series. Tasked with designing a lesson, pre-service educators must meet the challenge of preparing for an unknown audience; predicting topics that the audience may find useful; and using methods for teaching adults that are different than their previous knowledge of methods for teaching youth.

As students are preparing their lessons, the event is being promoted across professional networks and social media platforms. A Facebook invitation group is created, while flyers are printed and distributed at the stockyards. The event is effectively promoted by the "word of mouth"

communication systems of the community as well. On the day of the event, students come prepared to teach to the participants, who range from industry professionals, stockyards employees, beef producers and the general public. Participants are given feedback forms on which they "grade" the educator, giving them constructive criticism and praise for successes. After the lesson, participants and educators are able to discuss the lesson as a group, give feedback on what they liked and on what they would have rather seen, as well as any other pertinent feedback. The educator has time to network with the audience as well, building social capital and gaining insight into the industry.

Results to Date

The Beef Learning Series has just finished a successful second year this fall. The use of social media and communication outreach through industry networking led to an increase in participation from producers and industry professionals. Awareness of the program has grown via word of mouth and success stories from the previous year; with this awareness came more diverse, larger audiences. Perhaps the most important result, however, is the impact on pre-service educators in the University of Kentucky Agricultural Education program. One senior in the program had this to say of the experience: "This assignment gives me an opportunity to practice teaching to different groups. This setting allows me to speak directly to the public, which is important to me as an agriculture advocate, along with learning skills for teaching to other age groups outside the formal classroom." The agricultural education program has received positive feedback from recent graduates who cite the experience as beneficial in their new roles as agriculture educators.

Future Plans

Seeing the Beef Learning Series has thus far been a success, the teacher preparation program will continue to schedule this as an assignment within the senior-level Methods of Teaching course. Through professional networking and the advertisement of successful presentations (via social media and conversations amongst the professionals), the program plans to see increased participation as the learning series progresses in subsequent years. The agricultural education program would like to promote applicable learning opportunities like this one within the profession to aid other teacher training programs in facilitating learning series relevant to their own communities. This particular series focused specifically on the beef industry, therefore it is advised that the program reach out to other commodity groups to offer a more versatile experience.

Costs/Resources Needed

This teacher preparation program had an advantage in creating this Beef Learning Series in that the Kentucky Beef Council's education outreach coordinator is highly supportive of the program, assisting the professor in scheduling, recruiting participants, and counseling students on their lesson topics. The YARDS facility itself is free for educational use by institutions like the University, and is located within the same city, allowing for convenient accessibility to pre-service teachers and participants. Small tokens of appreciation bearing the University's Ag Ed logo were presented to the participants, at a price of $100 for the promotional gifts. This gift fosters professional relationships and encourages future participation.

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Bridging the Mandate Gap: Creating an Innovative Online Platform to Guide Teachers in Supervising Foundational SAEs

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Bridging the Mandate Gap: Creating an Innovative Online Platform to Guide Teachers in Supervising Foundational SAEs

Introduction/Need for Innovation

The purpose of SBAE is to recruit and prepare students for entry into food, agricultural, natural resources, and human sciences (FANH) careers (Phipps, Osborne, Dyer, & Ball, 2008; Roberts & Ball, 2009). SAEs play a vital role by exposing students to FANH careers, creating interest in FANH career pathways, and building career readiness skills through hands-on, experiential, apprenticeship projects outside of the classroom. Unfortunately, there has been a decline in the delivery of student SAE projects, which is a concern because agriculture is an *at-risk* industry ripe for a future potential skill gap (Oklahoma Department of Commerce, 2005).

Though HB 3006 has sent a strong message that career exploration and preparation in FANH areas is important, researchers (Marx, Simonsen, & Kitchel, 2014; Ramsey & Edwards, 2011; Robinson & Haynes, 2011) have noted that without educational resources, FANH content support, and creative approaches to reach those not typically involved in the SAE portion of the course, teachers fail to implement quality SAE experiences (Rubenstein, Thoron, & Estepp, 2014). Further, it has been suggested that to reach students not typically involved in SAEs, teachers must employ creative and innovative approaches for implementation with this underrepresented group of students (Retallick, 2010). The National Council for Agricultural Education (2014) shared recently, "The SAE is a required component of a total Agricultural Education program and intended for every student, not just those from farming backgrounds or in rural communities" (p. 1).

The pedagogical approach utilized in this innovative approach is modeled after Kolb's (2015) experiential learning process. The theory of learning aligns well with agricultural education (Baker, Robinson, Kolb, 2013) primarily because of the use of SAE projects to provide context to students' learning experience. Students engage in concrete experiences, reflect on those experiences, are provided abstract concepts related to agriculture, and then apply those concepts to their personal project or SAE. Research has repeatedly demonstrated the effectiveness of this strategy. However, this approach is predicated on the fact that students truly do connect to a personal SAE. Currently, only approximately 20% of students maintain an authentic SAE program. This project would make it possible for those not usually engaged in traditional SAE programs to explore FANH careers through the experiential learning process tied to exploratory SAE projects designed through the grant. The projects are purposefully designed to not require a great deal of money, family support, extensive time, or an immersion in the agricultural industry.

How It Works

During the first phase of the project, industry leaders and agricultural educators met to identify key foundational SAE experiences relevant to agricultural careers. At the conclusion of that meeting, eight to ten foundational experiences were identified for each of the AFNR career pathways. Phase two involved the creation of the foundational modules. These modules were created to compliment the newly released SAE For All model put forth by the Council for Agricultural Education. Each of those modules are currently being uploaded into a website

platform that will house and guide students in developing foundational SAEs. This platform is user specific allowing students to login to a system, explore agricultural careers using career exploration programs built by the National FFA Organization, identify a foundational SAE interesting to them, collaborate with their teacher, and ultimately submit final SAE products to be assessed by the agricultural instructor. Phase three of the project will focus on the dissemination, evaluation, and refining of the foundational SAE website based on beta testing results. Another unique element to the program is a number of career interest and agricultural knowledge assessments that will provide the opportunity for longitudinal assessment of growth and development resulting from foundational SAEs. Teachers will be able to operate within the system to assess their students, provide feedback, and monitor progress.

Results to Date

To date the conceptual designs of the modules have been developed and are in website design and development. The website is expected to be completely functional by December of this year and beta testing will begin in January.

Future Plans

Phase three of the project will begin in January. The website will be shared with the original cohort of teachers for beta testing. Adjustments to the modules will be made based on feedback and then the system will be released to a larger audience for full implementation. Data and feedback will be collected for six additional months to allow for final modifications and ultimate release of the resource to teachers for nationwide implementation.

Costs

This USDA-NIFA project direct costs equaled $34,119. Approximately 22% of the funds were allocated to the support of a graduate research assistant (salary $3,333, benefits $870). Fifteen percent of the funds ($7,000) are devoted to travel. Almost ten percent of the funds ($4,250) were devoted to ITLE, where an agreement was reached to receive support in creating high quality and innovative educational resources. The funds devoted to ITLE are primarily to pay staff to create the interest videos, develop and brand the experience modules, and design and deliver the final resource website integral to the project. To weave evaluation throughout the project, an outside evaluator ($3,000) was secured to assist in data collection, management, and analysis. Finally, almost twenty percent of the budget ($8,300) was devoted to the key collaborators crucial to the creation of industry relevant and effective SAE resources. Each SBAE educator was provided a $500 stipend to complete the pilot program including all assessments and rounds of feedback. During the third year, each SBAE educator was provided $500 to travel to both the COLT district meeting and NAAE conference where the resources and their effectiveness would be disseminated to state and national audiences.

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Building Agricultural Leadership through Policy Explorations

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Building Agricultural Leadership through Policy Explorations

Introduction/Need for Idea

Agricultural leadership programs are not a new concept with many states throughout the country having long standing programs designed to teach leadership to agricultural professionals. The North Carolina Agricultural Leadership Development Program is a two-year program designed to develop and promote personal and civic leadership skills in North Carolina farmers, agribusiness professionals, and other agriculturalists. This program consists of seven seminars throughout North Carolina, a legislative study tour to Washington, D.C., a United States domestic study tour, and an international study tour. The seminars and tours are focused on strengthening core competencies in personal leadership, understanding how to engage productively in civic leadership, and understanding the diversity of agriculture and its place in the United States and global economy.

To build effective community, state, and national leaders, an in-depth understanding of the legislative process is an important component emphasized throughout the ALDP program. There is a need to understand the importance of policy making and crisis management in all organizations with leaders capable of making adaptive policy changes (Janie, 1989). To assist in teaching about policy, instructors should use those instructional strategies that align with the policy making process such as public conversations, study circles, collaborative processes, and alternative dispute resolutions (Bingham, Nabatchi, & O'Leary, 2005). Many of the participants in this cohort are involved in local boards and associations, but few are involved beyond the local level. Griffin and Thurber (2015) found that many individuals recognize the need to advocate for policy changes but lack the knowledge to organize and participate in policy efforts. With a large majority expressing an interest in serving as officers and board members on organizations beyond the local level such as commodity associations, boards of education, and politics at the state level in the future, curriculum on the legislative process and policy making are essential to meet the needs of ALDP participants. In addition to an understanding of the legislative process and policy making, leadership and networking are also emphasized since they too are key components in the legislative process (Natesan & Marathe, 2014).

How It Works

Prior to the third session, ALDP participants interviewed five individuals seeking opinions on current agricultural issues. During the third session, the legislative and policy making process are the main topics with guest speakers, lobbyists, and agricultural leaders supplementing the instruction and explaining their role in policy. Following these workshops, participants placed their top five issues on notecards before working together as a large group to combine the notecards into categories. This process left eleven topics that were then discussed and voted upon, leaving six topics for the agricultural issue papers presented in Washington, D.C. during the policy tour.

During the two months following the session, participants worked together as a group to research their topic and develop a white paper. Participants were randomly assigned to the following topics: Farmland Loss, Harnessing Efficiency and Technology to Meet Food and Fiber Demand, Securing our Future through Career and Technical Education, Affordable and Quality Insurance for Farmers and Small Business Owners, Favorable Trade Policies for (State), and Establishing and Maintaining a Reliable and Cost Effective Guest Working Program. Participants were also responsible for scheduling appointments with their congressional leaders

and staffers prior to visiting Washington. The papers were submitted and combined into a booklet that participants then distributed during their congressional meetings.

Results to Date/Implications

After the Washington study tour, participants completed a reflection about their policy experience. The leadership team uses reflections and evaluations as a method to seek feedback on the participant's experiences. We then use that feedback to improve future programs and develop curriculum that will continue to meet the needs of the program. Because of the random group assignments, some of the participants discussed gaining knowledge about a topic that at first may have been unfamiliar. Participants were also asked to share what leadership competencies were reinforced through this experience. The following were categories stated by more than half of the participants: communication, delegation, cohesion, open-mindedness, and sharing of a common goal. On the increase in policy making and legislative process question with a scale of one to five (one being no increase in knowledge and 5 being a significant increase in knowledge), the mean was a 4.28 affirming the effectiveness of this policy project.

This is the second year participants have developed and presented an agricultural white paper in Washington. This experience allows participants to engage in the sharing of opinions, researching an issue, developing a white paper, and then effectively communicating an agricultural issue with their congressional leaders. Participants shared that they feel equipped with the knowledge and skills to advocate within their local community as well as at the state and national level. During their congressional meetings, the congressional leaders and staffers also offer feedback to the participants which is valued. Members of the last cohort continuously report, they are more comfortable calling their representatives to share opinions and working within their organizations to influence policy. As a leadership program, this policy seminar has proved beneficial to past and current participants.

Future Plans/Advice to Others

One of the issues that arose with the previous cohort was lack of participation from group members. This year group sizes were decreased to five per issue team with three check-ins from the program leaders in between sessions. The check-ins helped with the accountability of group members and answered questions that were needed for progress. Specific instructions and guidelines were also given to the groups to assist with developing their paper. However, we encouraged creativity with many groups choosing to use a variety of infographics, statistics, and creative handouts compared to a traditional white paper.

The program's leadership team has also considered allowing group members to choose their groups which is something we may try in the next cohort. For their second project that takes place during the second year of the program, participants are allowed to choose their practicum so we believe that the random assignment for one project is a useful skill in building leadership and research skills. There may be times where leaders are a part of a project that is unfamiliar which allows the leaders to seek input from those individuals who are more knowledgeable.

Costs/Resources Needed

The cost for the entire two year program is supported by an endowment and the participant's fee of $1,600. When considering the total cost, $1,600 (per participant) covers their study tour in Washington including travel, hotel, and meals. The cost of the agricultural issues booklet is approximately $200 for 100 copies that are also distributed to stakeholders in addition to the congressional offices.

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Community Supported Agriculture for Floral Design

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Introduction

Community-Supported Agriculture (CSA) is most commonly known as a way to bring people together who have an interest in locally grown food (Lang, 2010). Started in the late 1980s, CSAs developed from small farmers having a difficult time accessing credit needed to cover the labor, equipment, and operating costs required to start a growing season. CSAs operate by community members paying a fee upfront and then are provided goods throughout a season (Lang, 2010; Kolodinsky & Pelch, 1997). This need for resources upfront is mirrored in some school-based agriculture education (SBAE) courses. DiBenedetto (2018) recounted this burden by noting how resources are "a concern for all floral design teachers" (p. 22). Additionally, many people are unaware floral design, as well as other ornamental horticulture areas, is agriculture. These green industry is one of the United State's fastest growing sectors in crop related agriculture (Cotton, Marsh, Hashem, & Dadson, 2011). Much of floral design course work provides opportunity for science, technology, engineering, and math (STEM) integration including plant nutrition and care, plant identification, principles of design, and math accounting skills for money management and entrepreneurship (DiBenedetto, 2018). These STEM moments allow students to apply ideas from core academics to real life scenarios needed in order to make students college and workforce ready. SBAE programs, such as floral design, can provide a unique platform to connect students to their local community while at the same time promoting the agriculture industry as a viable career option. However, the concern for resources must first be addressed. This innovative idea program addresses Research Priority 3, *"Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century"* (Stripling and Ricketts, 2016, p.29).

How it Works

Historically, funding for floral design classes came from the Career and Technical Education (CTE) budget. No money was officially allocated to the floral design program, was only awarded on an as needed basis, and was limited to the purchase of non-consumable equipment and supplies. This CTE budget was also shared among the other 16 CTE teachers and the numerous classes within each pathway. Therefore, funds were limited. Previous teachers relied on silk and synthetic flowers for the majority of in-class activities. This left a need for a renewable source of additional funds specifically allocated for the floral design classes to be overseen by the floral design instructor.

Starting in 2016, a CSA was started where teachers, parents, and other community members could purchase a "share" in the floral design classes for $50 and receive five arrangements over the course of the school year. The first year, the CSA was capped at 20 available shares in order to make sure the project was feasible. Due to the popularity and rise in student enrollment in the classes, the second year the CSA was capped at 25 available shares with all shares being purchased both years. The CSA was advertised the first year by emailing an informational flyer to all teachers in the district, as well as by telling students in the class. The second year the CSA was only offered to students in the class, members from the previous year, and a few individuals who heard word of mouth. The CSA provided a disposable class budget for soft-supplies and materials of $1000 and $1250 in '16-'17 and '17-'18 school years respectively. While this was still a tight budget for the five arrangements throughout the course, a local florist agreed to supply flowers at cost. Additionally, flowers were also purchased in bulk through Sam's Club, Inc. and shipped to the high school. Lower cost flowers were used for all designs to help maintain cost. Arrangements aligned with holidays, with the opportunity to add additional arrangements for gifts for the Christmas holiday, as well as Valentine's day. Each

arrangement was done by students in pairs to reduce costs even further and each included a hand-written note by the students. Arrangements were delivered to local schools within the district by the instructor in addition to students with family member with a share taking the arrangements home.

Results and Implications

The Floral Design CSA has continued to prove an extremely popular, viable, and profitable option for dedicated class funds. The CSA not only improved the level of the curriculum offered within the class, but also the real-life feel that would of completing unique orders that comes with a career in the floral design industry. In consequence of designs delivered to CSA participants, the class was advertised throughout Athens. Local community members began reaching out for design for local events such as banquets and parties. The floral design class was able to make more arrangements for orders from individuals. This community involvement not only added more to the overall class budget, but as a valuable tie between the class, students, and the community. Lang (2010) noted how CSAs provide a tie between people who have a local interest in agriculture. The floral design CSA mirrored this relationship and allowed for students to make an impact on their community by providing a service. Furthermore, students saw arrangements throughout the high school from teachers who were CSA members. This led to steady enrollment of the floral design classes for the ’17-18 and ’18-’19 school years. Marsh et. al (2011) reported youth have a reluctance to pursue agriculturally related careers which in turn provides a limited number of prepared graduates to meet the needs of today’s workforce. Additionally, it was noted that high school students do not see the “multidisciplinary nature of agriculture not as only the production and marketing, but also as the science of the disciplines” (Marsh, et. al, 2011, p. 9). Opportunities for our students to learn valuable career skills that also give application for in-class knowledge are necessary in reiterating the importance of agriculture.

Future Plans

The CSA has continued into the ’18-’19 school year with a new instructor. The same format is still utilized with a cap at 25 membership shares. In the future, it might be necessary to raise the cost of the membership incrementally each year in order to keep up with the rising cost of floral goods.

There is a wide gap in the literature relating to floral design in SBAE. Research is needed in to the benefits of floral design classes, effective teaching methods, as well as the barriers for agriculture teachers who wish to take on such curriculum. Additionally, CSAs could prove as a beneficial method of fundraising for numerous other SBAE courses specializing in good and services. Research in to implementation of such programs would be beneficial for the SBAE community.

Resources Needed

There was no direct cost associated with implementing this program. Personal delivery of the arrangements by the instructor was utilized. Additionally, each arrangement included a card handwritten by students to increase the personal relationship with the CSA members. These methods are in line with Kolodinsky & Pelch (1997) who found that personal contact has a significant and positive impact on CSA membership. Support and buy-in from community members and stakeholders would be necessary for the success of a similar program.

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Differentiating Teaching Philosophies

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Introduction/Need for Innovation

The development of a written teaching philosophy has been deemed as a "cornerstone of reflective and scholarly practice in teaching and learning" (Coppola, 2002, p. 448). Chism (1998) also recognized the importance of a teaching philosophy as a reflective tool, requiring teachers to carefully consider and articulate their professional goals, actions, and vision. Traditionally, written statements are the form in which teaching philosophies are expressed (Coppola, 2002).

Chism (1998) noted the hallmark of a teaching philosophy is its individuality and while the content may be very individualized, often the expectation of a written document does not encourage personalization. In 2015, Hock and Bradford encouraged the use of nonlinguistic representations in having students represent their interpretations of the philosophy of agricultural education. They purported that the use of such differentiated instruction and purposefully designed course assignments meets the diverse learning needs of students while encouraging them to think critically (Hock & Bradford, 2015).

How it Works

In an effort to promote a more creative approach to the development of a teaching philosophy and allow for differentiated instruction and higher level thinking, the instructors of AEE 206 (Introduction to Teaching Agriculture) at NC State University opted to provide five options to articulate their philosophy beyond the traditional written linguistic format. Students were required to select two of the following five options:

Option #1 – Write a Thank You Letter to a Former Teacher
Please select an influential teacher from your past and compose a letter (~1 page).

Option #2 – Three Minute Long Elevator Ride Speech
Consider how you can articulate your desire to teach and beliefs about teaching in a concise timeframe. Create an audio recording (3 minutes) or write out what you would say in the 3 minutes (~540 words).

Option #3 – Create a Visual Representation
This can be hand drawn, computer generated, a mix of graphics or media. Also include a short representation to explain your graphic.

Option #4 – Create a Graphic Organizer
Use a graphic organizer to organize your beliefs about teaching and provide a visual representation or frame.

Option #5 – Review of Relevant Research
Review a minimum of three peer-reviewed research articles, about effective agriculture teachers and/or teachers in general.

In the completion of this assignment, students were asked to articulate 1) the characteristics of an effective teacher that they embodied, 2) why they want to teach, 3) their commitment to students, and 4) how they would incorporate the total program model of agricultural education.

Results to Date/Implications

The assignment was integrated into AEE 206 during Fall 2018 to encourage students to be creative in expressing their own personal philosophy of teaching. Since students were required to complete two of the options, there were 46 submissions from the class. Forty percent (n = 18) of the submissions were Option #1, in which students wrote a thank you letter to a former teacher. The rest of the submissions were equally divided between the elevator speech, the visual representation, and the graphic organizer. None of the students completed Option #5, which required a review of related research.

Future Plans/Advice to Others

It is anticipated that this assignment will continue to be used in the course. Since none of the students completed Option #5, the course instructor and graduate assistant will need to determine if this option needs to be revised or should be eliminated. Also, there may be some additional options that can be included next year such as TED talks, sales/announcement poster, instagram/social media story, or film storyboard.

With such an individualized assignment, grading can become tedious. A rubric was used to grade the submissions from Fall 2018, but the continued development of a more comprehensive rubric will be helpful to create a more efficient grading process. Additionally, examples of exemplary work are being compiled and digitally archived to share with future classes.

Costs/Resources Needed

There was minimal cost needed for the implementation of this innovative idea. The instructor and two graduate assistants invested time into brainstorming and creating the various options for the differentiated assignment. As well, the course instructor had to revise a rubric that had previously been used for the written teaching philosophy and the teaching assistant committed approximately four hours in grading the assignment. Students had the option of submitting either a digital or hard copy of their teaching philosophy. Any cost of supplies (paper, posterboard, markers, paint, etc.) was the responsibility of the student.

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Diffusing educational best practices adopted by Peace Corps volunteers to U.S. agricultural educators

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Diffusing educational best practices adopted by Peace Corps volunteers to U.S. agricultural educators

Introduction

Agricultural Peace Corps volunteers work alongside rural famers all over the world. Their experiences with effective education methods in diffusing innovations creates an opportunity for agricultural educators to gain a better understanding of successful agricultural practices. Tapping into this diverse resource has potential to elevate the agricultural education profession and contribute to the development of sustainable agricultural systems. Research priority area two of the American Association for Agricultural Education (AAAE) focuses on new technologies, practices, and products adoption decisions (Lindner, Rodriguez, Strong, Jones, & Layfield, 2016). A better understanding of new technologies, farmers growing food and fiber, as well as people who are food insecure is needed for the development of future sustainable agricultural systems (Lindner et al., 2016). Peace Corps volunteers have the unique position of working in rural farming communities for two years and observing the actual process of new technology adoption and diffusion. They gain firsthand experience and understanding of the food insecurities faced by rural farmers and their families as well as education best practices and adoption decisions behavior.

The methods and models most effective in diffusing innovations is a priority question in the AAAE national research agenda (Lindner et al., 2016). Peace Corps volunteers use many education methods to encourage the adoption of innovations. Educational practices such as individual and group instruction, result and method demonstrations, and experiential learning among others are used for various projects. The main focus for volunteers is behavior change and the adoption and diffusion of innovations to help community members become food secure. Volunteers act as change agents by bringing new innovations to communities and locating the opinion leaders to adopt the innovation and aid in its diffusion. Rogers (2003) states “diffusion campaigns are more likely to be successful if change agents identify and mobilize opinion leaders” (p. 388). Volunteers gain valuable knowledge working closely with opinion leaders and community members. Their experiences with effective education methods and adoption decisions of rural farmers should be analyzed to expand the information sources of agricultural educators.

Methodology

Phase one of this project was centered on the three year service of an agriculture volunteer located in a rural farming community in the country of Panama. Various educational methods were used to aid in the adoption and diffusion of various agricultural innovations during her service. From her experience she found result and method demonstrations to be most effective at diffusing innovations. Potential adopters are aided in the evaluation of an innovation if they observe it in use (Rogers, 2003). Demonstrations create an opportunity for learners to see value in the innovation and increase their motivation for adoption. Chizari, Karbasioun, and Lindner (1998) assessed the appropriate methods for teaching adult farmers and found result and method demonstrations to be the most effective. Result demonstrations are used to establish the

advantages of a practice while method demonstrations are used to teach a skill or practice step-by-step (Seevers, Graham, Gamon, & Conklin, 1997).

A solar dryer project was implemented during the volunteer's service to improve post-harvest management practices of local coffee farmers. A local opinion leader was identified and a demonstration solar dryer was constructed for the first harvest season. Demonstrations can be particularly effective if a respected opinion leader is the demonstrator (Rogers, 2003). Other farmers were able to directly observe the use of the solar dryer and its benefits. Community meetings followed to organize project dates and assess widespread adoption potential. By the following harvest 42 farmers were trained on post-harvest management and solar dryer construction and 100 percent of the 26 planned solar dryers were constructed and being used. This volunteer experienced great success with demonstrations as an educational method for diffusing innovations.

Implications

Agricultural educators partnering with returned Peace Corps volunteers would elevate the agricultural education profession by broadening and diversifying information sources. The experiences of volunteers who have worked directly with farmers, new technologies, the diffusion of innovations, and food insure populations is an invaluable source of information. The education methods found to be most successful by Peace Corps volunteers creates an opportunity for agricultural educators to gain understanding on effective methods with little resource expenditure.

Future Plans

Better collaboration needs to be established between returned Peace Corps volunteers and agricultural education professionals. Setting up social networking platforms, conducting focus groups, and evaluating volunteer success would be conducive to broadening and elevating the agricultural education profession. Opportunities could arise in the future for agricultural educators to partner with current volunteers for infield research on the effectiveness of new methods in diffusing innovations.

Resources Needed

Establishing collaboration between agricultural education professionals and returned Peace Corps volunteers would require various resources including personnel time, computer equipment, and instrument development.

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Equine Vaccinations: A "Ready-made" Lesson for 4-H Youth

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Equine Vaccinations: A "Ready-made" Lesson for 4-H Youth

Introduction

This year has been plagued by outbreaks of the West Nile Virus. The Center for Disease Control and Prevention (CDC) has reported 1,976 cases of West Nile activity in 49 states as of October 16, 2018 (CDC, 2018). This has caused numerous state agricultural departments to urge horse owners to ensure that their horses are properly vaccinated against this disease. My home state of New York issued its warning back in September after the fourth equine case of West Nile Encephalitis was reported in upstate New York. (CBS, 2018). The American Association of Equine Practitioners reports that 96.6% of non-human cases of West Nile Encephalitis are equine cases (AAEP, 2018). Therefore, proper vaccination protocols are paramount to equine safety. These recent outbreaks motivated me to create a teaching program for educators that would educate 4-H youth about West Nile and other core equine vaccinations.

This "ready-made" lesson targets 4-H youth interested in the horse program. These youth range from 7 to 18 years of age, so making the teaching enjoyable and informational to this wide age group is a necessity. Once developed, the lesson was taught to youth in my county. Most of these youth were participants in the 4-H horse bowl and hippology quizzing contest, so the goal of this teaching was two-fold: 1) provide youth with practical knowledge about vaccinations, and 2) prepare youth to answer disease and vaccination horse bowl questions in a competitive setting.

How it Works

The lesson consisted of seven major topics/elements using five different teaching methods and was approximately 70 minutes in length.

Virus versus Bacteria: The first 15 minutes of the lesson was devoted to providing information to students regarding the basic ways horses become ill. The underlying goals for this segment of the lesson were to demonstrate different ways each pathogen attacks the body and why bacteria can be treated with antibiotics while numerous viruses have no direct treatment. For this somewhat technical topic, two YouTube videos, called the *Amoebe Sisters*, were used. These videos provided a general overview of how bacteria and viruses operate using both instructional and humorous animations. After viewing the videos, a brief motivational game was employed to summarize the key points. Students sorted 3x5 cards into two stacks (bacteria and viruses) based on various descriptions of the characteristics listed on each card.

Vaccinations: After learning about pathogens, a brief discussion was held about how vaccines work. Students were asked to provide information about how the immune systems fight infection and how vaccines train immune systems.

Equine Core Vaccinations: To transition into equine vaccinations, a lecture was performed to provide youth with important information. Worksheets were printed out and disseminated so students could participate in completing the note pages while listening to the lecture. This activity improved overall engagement in the lesson. This portion of the lesson highlighted basic information about the five diseases that the American Association of Equine Practitioners (AAEP) recognizes as the core diseases for which all horses in the United States should be vaccinated. The students were then divided into two teams where they were presented with a

case study of an ill horse with one of the five diseases. Then, teams were placed in separate rooms where they prepared an oral presentation as a team. They were asked to diagnose the horse, provide information about the disease that was present, and explain how they would handle the situation. This case study and presentation is very much like the team problem required in the 4-H hippology contest, so this allowed them to think critically about the information they had just learned and practice preparing team problems that they will be expected to perform in competition.

What's in the injections? After the core equine vaccines had been taught adequately, students participated in a brainstorming session about what vaccinations are present in the "3-way", "4-way", and "5-way"vaccines.

Administering vaccines: The last portion of the lesson included a discussion about how vaccines are administered. One female participant admitted that she provides her horse all his vaccines, with the exception of rabies, on her own. Therefore, she was used as a volunteer to demonstrate to her peers where vaccinations are administered using a large model horse. Once completed, students received information about how to identify possible vaccination reactions.

Quiz bowl practice: The lesson concluded with a buzzer quiz session that focused on the information to which students were exposed during the workshop. This activity enabled students to further cement all that they had learned by participating in a horse bowl competition.

Handouts: As an academic organizer, additional resources in the way of handouts were disseminated to students. Specifically, articles on risk-based vaccines and other information about equine vaccines were presented and highlighted.

Results

The kids left with practical information about basic pathology, immunology, and equine diseases – all reinforced by practice exercises for their horse bowl and hippology competitions. Student success in these exercises demonstrated that the students had processed and retained the information successfully.

Future plans/advice to others

Horse bowl/hippology practices will continue for this particular group of students, covering a wide array of topics. In hindsight, it might have been best to provide the students just a couple articles to read instead of a comprehensive binder so that the next practice could open with another quizzing session on what was learned in the previous lesson and what they learned from their required reading, as a means of improving information retention and stressing continual learning in the particular subject area. The lesson will be shared freely with other interested educators for use with their student clubs.

Costs/resources needed

This lesson required a computer, projector, printing of binder material and notes handouts, an assortment of pens and pencils, one large model horse, and a handful of 3x5 cards. The majority of these materials were on hand, so the only fiscal cost involved was the printing of materials. In total, the sum amount equaled approximately $5.

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Exploring My World: A Cultural Awareness Curriculum

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Exploring My World: A Cultural Awareness Curriculum

Need for Innovation Idea

In an increasingly culturally diverse country, it is of great importance to educate young American children on various cultures. Specifically in Mississippi, where there is currently an influx of immigrants from various countries and cultures, children need to have an understanding of people from different regions as well as their cultural practices (American Immigration Council, 2017). Currently there is no Mississippi 4-H curriculum designed to educate the youth about various cultures. The *Exploring My World* curriculum will help 4-H participants to develop a greater understanding and appreciation for different cultures while using experiential learning activities that are fun and engaging.

There are many benefits of educating youth on various cultures. Youth who are knowledgeable about different cultures generally want to learn more about themselves and their own cultures, appreciate people from various cultures, value different perspectives, adapt more easily to working with people from diverse cultures, and understand how culture impacts a person's beliefs, attitudes, and actions (Victorson, 2016). Additionally, educating youth about various cultures teaches young people to think critically, to avoid racial prejudices, and to develop better communication skills (Garcia, n.d.; Kennedy, Bronte-Tinkey, & Matthews, 2007). Youth programs integrating multicultural education also have benefits including "potentially promoting healthier psychosocial development for youth" and "preparing youth to enter a multi-cultural workforce and society" (Kennedy et al., 2007, p. 2).

According to the American Immigration Council (2017), there were 72,258 foreign-born individuals residing in Mississippi in 2015. Among the countries of origin of the immigrants were Mexico, India, Vietnam, China, and the Philippines (American Immigration Council, 2017). This number of foreign-born Mississippi residents has increased from 39,908 in 2000, which demonstrates how rapidly the state is becoming more culturally diverse (Migration Policy Institute, n.d.). The increase in culturally diverse individuals living in Mississippi further proves the need for a 4-H curriculum that will help youth gain an understanding of various cultures that they will most likely encounter throughout their lives. Furthermore, an important aspect of 4-H is citizenship, which includes 4-H members developing an understanding of different cultures and the importance of global interdependence (Jamison, 2012). Youth who learn about various cultures are better equipped to develop citizenship skills in an increasingly diverse society (Smith & Pate, 2007).

How It Works

The curriculum includes six lessons covering various countries and their cultures. Each lesson consists of background information on the country and culture, leader prep, an experiential learning activity, and a participant handout. A pre- and post-test for each lesson is included in the curriculum as well as a pre- and post-test for the entire curriculum. The curriculum will introduce 4-H members to various cultures and will serve to broaden participants' knowledge of cultural practices and terminology related to the cultures of different countries/regions (Ghana, Australia, Brazil, Ethiopia, the Mediterranean, China, Guatemala, and India).

The target population for the curriculum is youth between the ages of 11 and 12. The curriculum will specifically target youth throughout Mississippi. Extension agents with 4-H responsibilities will deliver the curriculum to their local 4-H club members and youth in the public school system as well as to other youth and partner organizations upon request.

Results to Date

Thus far, preliminary studies have been conducted on all six lessons with positive feedback from every lesson. During the preliminary studies, feedback was acquired from both adults and youth who reported the lessons to be interesting, well-designed, engaging, fun, and age-appropriate. Minor suggestions were made for curriculum improvement including modifying lesson activities and providing additional options for lesson materials.

Future Plans

To further evaluate the curriculum, it is recommended for the lessons to be pilot tested among 4-H agents throughout Mississippi. During the pilot tests, the leader evaluation document, leader observation form, and participant evaluation document will be used to collect qualitative data. Once the data has been collected and the curriculum has been modified as recommended, workshops promoting the curriculum will be offered at district and state conferences throughout Mississippi to generate interest among 4-H agents and volunteers.

Additionally, it is hoped that the curriculum will be approved for usage as a state-wide program by the Mississippi State University Extension Service. Extension agents will then be able to select it as part of their yearly plan of work. Contests or workshops based on the curriculum could also be developed for 4-H members to participate in at Project Achievement Day and State 4-H Congress. Furthermore, the curriculum has the potential to evolve into a national curriculum offered through the National 4-H Council.

Cost/Resources Needed

The development cost for the curriculum was $0 as it was the author's graduate project. The cost of the materials for the preliminary studies of the curriculum was approximately $100 and paid for by the Tishomingo County 4-H Program. No funds are currently allocated for training or administrating the curriculum. Training will occur at district level meetings and state conferences. The curriculum will be published as a printable document on the Mississippi State University Extension Intranet.

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Food and My Story: An Exercise in Diversity Consciousness

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Food and My Story: An Exercise in Diversity Consciousness

Innovation

Research Priority 7 of the 2016-2020 National Research Agenda for the American Association for Agricultural Education (Andenoro, Baker, Stedman, & Weeks, 2016) calls for the profession to address complex problems in agriculture. To tackle some of these complex problems in agriculture, students need to recognize cultures other than their own in order to work effectively with others. Students in agriculture-based programs need to be prepared for diversity in the workforce (Rodriguez & Lamm, 2016). Our innovation, *Food and My Story*, is a class assignment used to increase diversity consciousness in a multicultural leadership course taught in the agricultural leadership program at Oklahoma State University.

As the American population diversifies, so does the population of those involved in agriculture. Many believe agriculture as an industry, and agricultural education as a discipline, are not keeping up with these changes (Vincent, Killingsworth, & Torres, 2012). Diversity consciousness, defined as having an understanding and skill set relating to diversity (Bucher, 2015), is perhaps the starting point in diversity education. Bucher (2015) outlines six stages of development in diversity consciousness. In the first stage, students are asked to explore their own diversity. Before students can make sense of other cultures, they have to be aware of their own. *What makes me unique? What is my own culture? How am I different from other students?* are questions we ask students to ask themselves as a part of the *Food and My Story* assignment.

How It Works

In this assignment, we ask students to prepare a food item with special significance to their family and culture. This food item can be eaten on a regular basis or prepared for special gatherings. The following instructions for the assignment are provided to students:

- Before preparing the item, contact a family member to discuss the recipe and your family's history behind this item being served at family meals, holidays, or other gatherings. Include your family members' reaction to this assignment.
- Cook/bake/prepare the item and take photos of you preparing the item. Include three to five pictures in your presentation. Please prepare the item yourself. To receive documentation points, you must be in at least one of the photos and the photos must clearly demonstrate that you prepared the item yourself. Invite friends over to sample your wares when you are done cooking.
- In your PowerPoint presentation include the recipe (ingredients and instructions) as well as your family's story as it relates to the food item.
- Integrate at least three course concepts or quotes from our text in your six slide PowerPoint presentation. Use BOLD print to signify keywords or quotes.

Once the assignment is complete, students submit their presentation to the course management system for grading and post to the course's online discussion board. Students view their classmates' presentations and ask questions about recipes shared to better understand how family food traditions represent unique aspects of their cultures.

Results to Date

Approximately 400 students enroll each year in the multicultural leadership course and complete the *Food and My Story* assignment. Student feedback on this assignment has been overwhelmingly positive. Many students comment about the excitement of family members getting to participate in the class by helping with the assignment.

- "My mother always prepares the Ota for my family, and when I told her about this project and how I would have to prepare the food, she was excited to give me the recipe" (Sione).
- "When I told our family about this assignment my wife actually shouted 'Sopa de Pollo'. The same reaction occurred with many of my other family members" (Matt).
- "I called my grandma and told her that I had an assignment to make a family recipe. She was excited to hear that I had chosen her recipe and was eager to help. I FaceTimed her through the whole process" (Jeremy).

Through creating their own presentation and reviewing those of their classmates, students can increase their diversity consciousness, which is assessed through the integration of course concepts in their presentations. There are several recurring concepts in the projects that students connect to course content, such as assimilation, pluralism, and cultural cruise control (Bucher, 2015).

- "A few of my friends from different places around the U.S. also have this class and I went to try their foods and I think that helps with cultural cruise control by trying new things," (Jamaal)
- "Culture is something I believe that is special, and when it comes to foods, it is definitely something that unites people," (Jessica).
- "Although generations and cultures seem to change overtime as they choose to assimilate with coexisting cultures, my grandmother's recipe stayed true to its origin" (Tyrell).
- "Just think, if people only ate fast food or boxed meals our food pluralism would soon all start to assimilate, and everyone would be eating nearly the same thing, there would be no history or diversity in our food," (Amanda).

Future Plans and Resources Needed

The agricultural leadership program at Oklahoma State University plans to continue the use of *Food and My Story* in the multicultural leadership course. We are considering several variations on this assignment. As the assignment is used exclusively in an online course, giving the option to create a video might increase interaction between students in the discussion board. Many of the students enrolled in the online course are campus-based students, so we are also considering adding the option of having students share their food product with the class in a central location on campus at a specified time. Sharing their prepared recipe could increase cultural awareness by further celebrating and highlighting each student's culture. The faculty are also very interested in sampling the recipes. This project does not have any costs, nor does it require any resources for the instructor, unless he or she wants to participate in the project. Students do incur the cost of preparing their recipe, which we hope fits into their normal grocery budget.

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Georgia Agricultural Education Partners for Pollinators

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Agricultural Education Partners for Pollinators

Introduction/ Need for Innovation or Idea

Monarchs face many risks that are resulting in declining populations in both the eastern and western parts of their North American range. The largest impact is recognized as the loss of habitat for breeding, migrating, and overwintering (Flockhart et al., 2017). This loss of habitat has received national notice from numerous prominent figures such as President Barack Obama, who during his service enacted a federal strategy in favor of pollinators (Obama, 2014). This project will develop and implement native milkweed production through partnerships with high school and middle school students, utilizing school greenhouses. Over the course of the project, lesson plans, experiential learning activities, and science projects for students enrolled in middle school and high school agricultural education programs were developed. The partnership utilized a unique combination of resources to accomplish these purposes. Many agricultural education programs in the state have greenhouse facilities. These greenhouses provide lab space for students to conduct research projects related to plant science and soil science. Middle school and high school teachers utilize this research space in their greenhouse laboratories to produce native milkweed plants for transplanting in the appropriate ecoregion and native plant communities. The production of these native milkweed plants are useful Agricultural Science experiential learning projects for students. This project partnered teachers with citizen scientists who have been tracking the migration of monarch butterflies for decades (Oberhauser, 2013).

How it Works/ Methods/ Program Phases/ Steps

Phase One was to enlist agricultural education program partners for producing and distributing native milkweed plants. Initiating a partnership involves conducting teacher in-service training involving production methods for milkweed. In addition, lesson plans were developed by the project team for use by teachers in their classrooms. Lesson plans describe in detail the cultural practices for milkweed and the necessity for milkweed to be incorporated into native plant communities for Monarch butterflies. In addition, the lessons explain the importance and general purpose of pollinators as well as their value to production agriculture.

Phase Two was to further develop and refine lesson plans and instructional materials for distribution to Georgia agricultural education middle school and high school students, as well as to citizen scientists and young farmers. This project created train-the-trainer workshops that will equip citizen scientists with the resources necessary to conduct community workshops on the development of monarch butterfly habitats.

Results to Date/ Implications

Unit lesson plans on pollinators emphasize on monarch butterfly habitats. Two three-day train-the-trainer workshops for educators provide instruction to engage 400 students with best practices in greenhouse management, growing milkweed and other native plants for habitat development.

Advice to Others

This project has numerous stakeholders. Some of which are teachers, citizen scientists, and the institution from which the researchers come from. Researchers should spend more time than they think is necessary to make certain that citizen scientists and faculty on the project understand each other in terms of content and procedure. Citizen scientists may not understand the

bureaucracy of a higher education institution. With regard to pollinator gardens, it is important to note that native species of milkweed may occupy a very narrow or limited area (Pleasants & Oberhauser, 2013). For instance, our host-project schools that will propagate milkweed may only collect the plant from within a 60-mile radius of the school. Many of the agricultural advocacy groups have citizen scientists as members. University researchers should look beyond the gates of academe in order to find these individuals. They are a rich source of information and can provide advice on seeking external funding from non-traditional sources.

Costs/ Resources Needed

The following budget is broken down into three basic areas: personnel, workshop lesson resources development and milkweed propagation. Dr. Fuhrman provides the technical expertise in the development training and delivery of instruction on pollinator health, specifically the monarch butterfly. Dr. Croom and Dr. Rubenstein provide expertise on the physiology of the monarch butterfly and its preferred habitat, and the development of high-quality lesson plans and training materials designed for middle grades and high school students, and teacher in-service. A graduate student conducted research and provided foundational support for the development of instructional materials. In addition, the graduate student served as the resource person for schools who are growing native milkweed plants in school greenhouses. All of the personnel involved in this project provide instruction at workshops developed by this project. This budget also provided funding for the development of high-quality teaching resource materials. Lesson plans and resources must be age appropriate and focused on the specific development levels of adolescents and teenagers. Finally, the budget provided for the growth and development of milkweed plants in greenhouses at high schools and middle schools across Georgia. This includes seed, growing media, and containers for the growing plants.

Personnel: $35,907
Travel: $3,092
Direct Cost:
    Materials and Supplies: $10,875
    Publications: $6,170
Indirect Costs: $13,352

Total Costs: $69,396

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Implementation of Video-Based STEM Curriculum Marketed Through Social Media

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Introduction/Need for Innovation

Science and technology lay at the foundation of the 4-H program since its creation. 4-H was established in response to a need for advanced agricultural practices (Borden, Perkins & Hawkey, 2014). Today STEM (Science, Technology, Engineering, and Math) in 4-H has considerably evolved from its beginnings of agriculture and canning. It has expanded to cover topics such as coding and robotics (Kress, 2014). Fayer, Lacey and Watson (2017) noted STEM occupations are predicted to be in high demand and will be top-paying positions compared to non-STEM positions. 4-H has attempted to bridge the gap in young people's interests and participation within STEM project areas (Heck, Carlos, Barnett, & Smith, 2012).

As defined by the National Research Agenda of AAAE, research priority four warrants further research of digital technologies impacting education and online learning settings (Roberts, Harder, & Brashears, 2016). The conceptualization of this project is to educate audiences in a non-traditional setting with STEM curriculum designed into video media. According to Wickstorm and Specht (2016), social media networks can gain and influence followers on various platforms. Practical tools like social media are needed to gain the interest of 4-H youth (Galloway, Arnold, Bourdeau, & Nott, 2013). This project uses social media platforms to promote STEM curriculum further to facilitate youth and educators.

How it works/methodology/program phases/steps

This project was developed with the intent to evolve STEM curriculum into a video form marketed through social media. In the Spring of 2018, Oklahoma 4-H began to develop activities and lessons into videos for social media use, particularly through Facebook. Educators, volunteers, parents and youth who “like” Oklahoma 4-H on Facebook and those who subscribe to YouTube, can view 4-H STEM curriculum developed into 2-3 minute videos.

Facebook was selected as the primary medium of choice, based on demographics and target audience. The information posted on Facebook and the Oklahoma 4-H website includes demonstrations, and steps, and links to lessons and handouts to ensure maximum educational benefits were provided. Literature indicates an absence of social media links hinder users from finding and spreading information (Rumble, Settle & Irani, 2016). When posting content to Oklahoma 4-H’s page, analytics were utilized to maximize the total number of impressions.

The video series was constructed based on Kolb’s Model of experiential learning (ELT). ELT was developed from the conceptualization that learning and understanding is achieved through experiences or active learning (Kolb, 1984). ELT may be paraphrased and interpreted in layman’s terms as (1) active participation, (2) reflection of the experience, (3) evaluation of experience, (4) and the formulation of solutions to attempt again (Kolb, 1984). Similarly, the National 4-H Recognition Model encourages the “learning by doing” philosophy, which allows youth to complete hands-on projects (Kress, 2014).

A three-person team worked in conjunction to create this project and individual positions were created: video editor, scriptwriter, and layout designer. The STEM coordinator determined content and scripts for each video. The layout designer designed instructional handouts and strategized

appropriate times to post videos to social media. Video editor filmed and edited videos into the final product. All team members participated in the videoing recording process.

Results to Date/Implications/ Limitations

Currently, data analysis from the three videos posted on Facebook has resulted in 1,610 views, 39 shares, three comments, and 65 likes. Adding to the total is a combination of 96 unique IP addresses and viewers on YouTube. Reaching 29%, of Oklahoma 4-H's Facebook audience or "likes." With post receiving comments like "You getting this ready for next meeting?🙄" and "how cool is this !?!?." from Oklahoma 4-H "followers".

Due to a shortage of science and engineering careers in the United States, Extension has advocated a push for STEM activities and curriculum (Sallee & Peek, 2014). The development of these programs is trending with parents of youth (Drugger, 2010). Research studying the effectiveness of non-traditional versus traditional curriculum can ultimately create new markets for curriculum. The effectiveness of information released on new platforms versus the previous methods cannot be measured.

Future plans/advice to others

Upon reflection, Oklahoma 4-H staff plan to continue converting STEM curriculum into video mediums to be shared on social media platforms. Revisions to the study are as follows: videos will be released once a month, videos of 5-10 minutes will be added with more in-depth information on separate data bases, the shorter version will be promoted through social media. Additionally, videos will include materials, commonly found at home and do not require being bought explicitly for the video's activities. The Oklahoma 4-H Marketing Coordinator recommends keeping videos relevant and under three minutes to capture audiences for the entire length of the video. It is recommended to allow adequate time to prep, shoot, and release videos.

Costs/Resources Needed

Successfully implementing a video series will include these materials: a DSLR camera ($527.15), Creative Cloud subscription ($21.99), a mic ($79.90), an actor (volunteer), Filming location (free), social media (free), curriculum (free), and materials for the experiments selected. For this project, we used Oklahoma 4-H resources which were easily accessible resulting in a low cost production. Oklahoma 4-H, bought a mic. The prices listed are as if this project was created with no resources available. There are many alternative methods to complete a similar video series.

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Inclusion of Special Education Students in Agricultural Education Through Cooperative Learning

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Inclusion of Special Education Students in Agricultural Education Through Cooperative Learning

Introduction

Inclusion in education is the idea that no child or learner shall be excluded from public education based on their differences (O'Hanlon, 2003). In the United States, a free and appropriate education shall be provided to all children regardless of disability (IDEA, Public Law 101-476, 1990). While there is a clear obligation to include children with exceptionalities, few agriculture teachers feel that they have the skills to do so (Giffing, Warnick, Tarpley, and Williams, 2010). Hoerst and Whittington (2006) purported that restructuring pre-service agriculture teacher programs to include more instruction on how to teach learners with special needs was necessary. Incorporating a cooperative learning approach where students with special needs learn from general education peers can be effective. A cooperative learning model can improve student performance and peer relations, while integrating students with special needs into general education (Stevens and Slavin, 1995). General education peers can provide cognitive support and be someone that students with special needs rely on for feedback and coaching (Stevens and Slavin, 1995). This abstract outlines the implementation of a cooperative learning model at the secondary level and incorporating special needs inclusion training in undergraduate pre-service teacher courses to increase inclusion of students with special needs in school based agricultural education (SBAE). Additionally, implementation of this innovative idea could increase pre-service teachers' self-efficacy when working with students with special needs. This innovative idea aligns with Research Priority 2 of the *National Research Agenda* (Linder, Rodriguez, Strong, Jones, & Layfield, 2016).

How it Works

Ponchatoula High School is located in the rural community of Ponchatoula, Louisiana. Ponchatoula High School serves a student population of over 1,800 with 400 students enrolled in agriculture courses. In the 2017-2018 school year, 11% (46) of the SBAE enrollment were students with severe special needs. Aside from being enrolled in agriculture courses, these 46 students primarily learned in six, separate, self-contained classes with an assigned special education teacher and two paraprofessionals. To fully include these students in SBAE, a cooperative learning course (Agricultural Leadership) was created. This course provided experienced senior level students to be partnered with students with special needs to serve as peer mentors referred to as "Ag buddy" teams. Prior to this partnership, senior student mentors completed a multi-week sensitivity training where they learned about the history of special education, specific disabilities, and educational accommodations. In addition to special education training, the senor mentors learned about proper lesson planning. After the completion of the training, the mentor students were charged with the task of reflecting on prior agriculture courses they had taken to develop weekly lesson plans to teach. Partnerships of students were assigned by the agriculture and special education teachers with much consideration given to personal interests, personalities, gender, physical accommodations, and student requests. The same partnerships were used for the entire school year. Senior mentors, with guided assistance from the teachers, taught agricultural lessons that focused on developing social skills, employability and life skills, and basic agricultural literacy.

Results to Date

The Agricultural Leadership course has been implemented at Ponchatoula High School for two academic years. A total of 41 senior mentors and 50 mentees with special needs have completed the course. This course allowed 100% of self-contained students with special needs to be enrolled in a course with general education students. Senior mentor students developed skills in mentorship, leadership, teaching/curriculum planning, and gained an overall appreciation for diversity and inclusion. What started as mentorship and cooperative learning within a classroom environment eventually led to miraculous friendships outside of the classroom. Ag buddy teams spent time eating lunch together, attended FFA events, attended school functions like dances and sporting events, and even spent free time together after school and on weekends. Students with special needs gained social and employability skills though agricultural lessons taught by their senior mentors and teachers. Amanda Armstrong (personal communication, October 22, 2018), special education teacher stated, "As a result of our Ag buddy program, relationships were formed between unique individuals that may have never happened if it not had been for this program. As for my special education students, the program raises their self-confidence and self-esteem. The program allows them to feel accepted, which does not always happen for students with disabilities." Additionally, an increase in inclusion of students with special needs was seen across campus

Future Plans

The Agricultural Leadership course will continue to be offered at Ponchatoula High School, but similar experiences should be expanded to other programs. Recognizing that there is a gap in agriculture teachers' skills to include learners with special needs (Giffing et al., 2010), future plans should include the incorporation of a program of this nature in pre-service teacher training. For example, a partnership could be developed between a local high school and pre-service teachers enrolled in a teaching methods course. Pre-service teachers would be instructed on how to serve as mentors to local students with special needs and tutor them weekly. This partnership would allow pre-service teachers to develop relationships with students with special needs and receive guidance from the special education teachers and paraprofessionals. Through their experiences, pre-service teachers would develop the skills and confidence necessary to implement a similar mentorship program in their own agriculture programs. Further, pre-service teachers should be challenged to reflect on their experiences and plan for future implementation.

Resources Needed/Costs

There are no direct monetary costs associated with this program other than typical consumables based on topic selection. However, teacher educator time to develop relationships with local school administrators and special education teachers is needed. To implement the program mentioned under future plans, a considerable amount of time in program planning and a partnership with a local high school would be required.

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Introduction

Today's cellular phones have expanded from only being capable of making phone calls to having the full functionality of an internet connected computer (Lepp, Barkley, & Karpinski, 2014). Now called *smartphones*, these devices are readily accessible and regularly used by college students (Lepp et al., 2014). More than 95% of Americans now own a cell phone, with 77% reporting that they use a smartphone. (Pew Research Center, 2018). Because of this widespread accessibility, smartphone use in the classroom has emerged as an attractive option for educators to incorporate technology in their instructional practices.

While smartphones have been used in various education settings, probably the most common uses are (a) facilitating engagement and (b) encouraging student reflection (Cochrane & Bateman, 2010). The use of reflection serves several purposes, "from improving technical proficiency, through growth as a professional, to changing a whole society" (Procee, 2006, p. 238). As a consequence, when educators facilitate student reflection, they should encourage students to engage in individual learning processes and construct their own knowledge and unique understandings (Roberts & Edwards, 2016). Therefore, video reflection applications such as ReCap® allow educators to engage students in individual, thought-provoking reflection, and also present opportunities for educators to offer more timely, honest feedback to their students, especially in study abroad programs in which time is limited. Such reflection and dialogue can foster *transformational learning* Mezirow (1991), which promotes students' conceptual understanding and cultural competence (Kiely, 2004).

How it Works

The ReCap application is available for free to download on both iPhone and Android smartphones, which is appealing to both educators and students. The application provides a platform for educators to pose questions to expand discussions and initiate conversations through video and asynchronous chat options. The functionality of the application is simple and only requires a smartphone, the application, and an internet connection. For this innovative idea, we began by posing open ended question about Louisiana State University Agriculture students' personal and agricultural-based experiences during a one-week study abroad to Nicaragua. Thereafter, students recorded themselves providing video responses.

For educators, ReCap® provides an opportunity to have students engage in a thought-provoking reflection on learning tasks, assignments, or other educational experiences. By recording video reflections in real time, responses seem more visceral and genuine, and this reflection approach also allows students to ponder existing complexities more intimately. These reflections can then be combined with other forms of discussion to facilitate dialogue and reflection on various subjects.

Results to date

Existing evidence demonstrates that study abroad programs can transform students' intercultural sensitivity, global knowledge, and views on agriculture (Roberts & Edwards, 2016; Strange & Gibson, 2017). While implementing a study abroad program in Nicaragua, we used ReCap® to facilitate such transformations by implementing experiences and reflections that challenged students' existing values and worldviews– a concept known a *dissonance* (Kiely, 2004). To investigate the effects of ReCap®, we analyzed participants' daily video reflections. Reflections were then transcribed, and data was analyzed using Corbin's and Strauss' (2015) constant comparative method to facilitate three coding procedures: (1) open, (2) axial, and (3)

theoretical. Through continuous analysis and data reduction, findings emerged. The key finding of this qualitative inquiry into the process of transformational learning among students was a single, powerful core theoretical category: *dissonance.* Grounded in Mezirow's (1991) *transformational learning theory*, dissonance reflects the internal challenge to an individual's existing value system or worldview (Kiely, 2004; Mezirow, 1991). Findings were narrated through three themes: (1) *environmental*, (2) *sociocultural*, and (3) *personal* that represented the various forms of dissonance experienced by participants.

Future Plans

The number of students participating in study abroad programs has been steadily increasing over the past few decades (Strange & Gibson, 2017). There has been a significant amount of research on the impacts, benefits, and deterrents of study abroad programs, but little work has been done in regard to analyzing the use of smartphone application technology to facilitate critical reflection during such experiences. Thus, a need existed to further investigate the effective uses of innovative technology to facilitate critical reflection.

Using this innovative idea, we noted that pairing a video reflection application such as ReCap®, with group-oriented reflection sessions allowed students to better understand the various forms of dissonance as well as their shifting internalized preconceptions ,which resulted in positive self-growth and increased cross-cultural competency. However, the use of ReCap® is not limited to international experiences, and further exploration of the role of programs like these in encouraging discussion and reflection among various educational settings is strongly encouraged. Moving forward, therefore, we intend to implement ReCap® in new educational settings. It should be noted that ReCap® will be discontinued in January 2019; however, its successor Synth® is expected to yield similar benefits.

Cost

Perhaps the strongest benefit regarding the use of ReCap is its minimal cost. Many video reflection tools such as ReCap® are smartphone friendly applications which are free to use, easily implemented by educators, and designed to be user-friendly for students. Not only will the use of video-reflection applications like ReCap® allow educational programs to save costs while implementing groundbreaking technology, but it also assists in conserving time as reflections can be instantly recorded and saved for future analysis and discussion. One issue we noted was that a reliable internet connection was required, as with other smart-phone based technology, which created some issues when using it in a developing country such as Nicaragua.

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Professional Development for Sustainable Bioenergy Education

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Professional Development for Sustainable Bioenergy Education

Introduction/Need for innovation or idea

With an increasing demand for technological advancements and a generation set to retire, the amount of available jobs in science, technology, engineering, and math (STEM) is on the rise (Terrell, 2007). The need for people to work in STEM fields has continued to grow, and high school graduates are being asked to fill this need (Terrell, 2007). Unfortunately, secondary students are lacking in their overall STEM knowledge (Stone, Alfeld, & Pearson, 2008). What is more, when comparing test results, U.S. students lag behind their counterparts from other countries (Hanushek, Peterson, & Woessmann, 2014).

By participating in math and science competitions, students can prepare themselves better for a STEM career (Terrell, 2007). Fortunately, agricultural education serves as a natural nexus for preparing students for future STEM careers due to the existing STEM competencies found within the agricultural education curriculum (Myers & Thompson, 2009; Smith, Rayfield, & McKim, 2018; Swafford, 2018). Unfortunately, however, agricultural educators do not always possess the necessary STEM knowledge required to teach it effectively (Scales, Terry, & Torres, 2009). Thus, professional development is needed. To address this need, Oklahoma State University successfully developed and received funding for a grant aimed at cultivating STEM knowledge for educators (e.g., STEM teachers, school-based agricultural education teachers, and 4-H educators) from Oklahoma, Kansas, Texas, and Arkansas regarding bioenergy and bioproducts.

How it works/Methodology/Program Phases/Steps

Educators were recruited though social media, various educational websites, 4-H offices, and word of mouth. Sixteen agreed to participate in the inaugural weeklong session at Oklahoma State University in June 2018. During the weeklong session, educators rotated through various classroom and laboratory learning sessions related to bioenergy and bioproducts, which were delivered by Oklahoma State University scientists. Content (i.e., lecture material, PowerPoint notes, and visual aids) was modeled to educators in a *train-the-trainer* format so that educators could replicate the material later with their own students. Individual sessions ranged from 60 to 75 minutes in length with numerous opportunities existing for educators to engage through experiential learning activities. In addition to the formal learning environment, offsite field tours were included where educators were able to learn about and observe biobased producing field crops in their natural growing element. Specifically, educators toured Oklahoma State University's bioproducts farm as well as the Noble Research Institute's main campus in Ardmore, OK to learn about a variety of biobased crops and their uses. The ultimate goal of the grant is to increase students' awareness of and interest in bioproducts by having them engage in an experiment in which they create a science fair project. Therefore, in addition to technical science information, educators received training on using statistics, setting up quality experimental designs, analyzing data, recognizing and reporting statistically significant differences between two phenomena, and coaching their students to design high quality poster displays and make effective oral presentations for the science fair project. To accommodate educators' needs, time was allotted each evening for brainstorming sessions regarding potential bioenergy-related experiments that could be conducted with their respective students.

Results to Date/Implication

Quantitative data (i.e., at the beginning and end of the weeklong session) were collected on the educators by the research team and will be analyzed and reported in the future. The participants also provided qualitative data on the different aspects of the training. When asked about the gains made in their understanding of bioproducts as a result of the workshop participant 16 said, "my understanding has vastly improved, and it will help me teach my students with greater confidence about the subject." Participant 1 reported, ". . . the detail that was provided gave me more in depth knowledge, and filled gaps in my existing knowledge."

Future Plans/Advice to Others

Future trainings will be held during the summer months at Oklahoma State University in Stillwater, OK over the course of the next two years. Specifically, 30 teachers will be selected each year for the next two years to participate in the project. Each cohort of teachers will spend one week receiving hands-on experiences with biobased energy research. The teachers who complete the weeklong training will be expected to become Bioproduct Fellows over the course of the year. To become a Fellow, an educator must support student-led research which will be presented at their respective state's science fair, complete ongoing educator training during the school year, and provide future support for student bioenergy research. The educators will leave at the end of the weeklong training with all the supplies (~$1,000 per educator) necessary to conduct various bioenergy experiments. Additional supplies will be provided to teachers who have a large amount of students interested in bioenergy. In addition to training the educators, students will receive support though a constructivist massive open online course (cMOOC). They also will receive assistance through a phone application. The application will feature statistical tools (i.e., ANOVA) to allow students to analyze their data on their student-led experiments. Data will be collected from students who participate in the science fairs to evaluate the degree of learning achieved, the range of perceived knowledge and skills gained, and the effectiveness of the experience as a lasting impact on the students' career paths and degree plans. Any student who does not have access to a traditional science fair will be able to participate in a one-half day science fair held during the Oklahoma 4-H Roundup. Two STEM students, two 4-H members, and two FFA members will be selected, along with their educator(s), to attend bioenergy experience trips which will be held on the second and fourth years of the project. These trips will include university visits as well as tours of local bioenergy or bioproduct facilities in different states. Throughout the program, assessments will be administered to the educators, faculty, and students evaluating the variables of interest within the framework of this study such as self-efficacy, interest, motivation, attitude, ability to perform STEM-based professional skills, and future STEM-based career interest. The data collected will be used to make changes and modifications to the existing structure. By the end of the project the researchers expect to impact over 10,000 high school students in the area of bioproducts.

Costs/Resources Needed

The costs associated with this project include educators' room and board for four days and nights (i.e., hotel, three lunches, snacks, and breakfast at ~$500 per person) in Stillwater, OK. In addition, each educator who participates will receive STEM-based laboratory supplies (i.e., chemistry sets, lab coats, centrifuge tubes, timers, thermometers, pipettes) used during the week, valued at $1,500.00 each. The travel expenses also are covered as a result of the grant, although these costs will vary by participant. In total, ~$50,000 was used to host and professionally develop 16 educators during Year 1 of the bioenergy grant experience at Oklahoma State University.

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Project PLANTS: Planting Middle School Leaders in Agriscience

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Project PLANTS: Planting Middle School Leaders in Agriscience

Introduction/Need for Idea

Enrollments in agriculture majors have decreased in the last 20 years, despite the employment opportunities that continue to abound for college graduates in food, fiber and natural resource sectors (Darnell & Cheek, 2005; Goecker, Smith, Fernandez, Ali, & Theller, 2015; McAllister, Lee, & Mason, 2005). A 2009 report of the Association of Public and Land Grant Universities also noted a widening gap between the number of agricultural job vacancies and the number of graduates needed to fill them. Compounding the need for a skilled agricultural workforce, reports suggest American youth lack agricultural knowledge and literacy while holding misconceptions about agriculture (Fields, Hoiberg, & Othman, 2003; Myers, Breja, & Dyer, 2004; Overbay & Broyles, 2008). While research has shown that students are making decisions about their careers as early as middle school (Tai, Liu, Maltese, & Fan, 2006), students at this age may lack exposure to the agricultural career possibilities in the STEM fields, thus they may be making decisions about career choices without accurate information. By the time students reach high school, attitudes and interests in science fields, including agriculture, have already declined (George, 2000). Caleon and Subramaniam (2008) concluded there is great potential in intervening with middle school students because many of them are undecided in their attitudes toward science as a career preference.

With interest in science declining during middle school years (Potvin & Hasni, 2014), positive experiences are needed at this critical time in science, since these experiences create a higher likelihood that students will succeed in science subject areas and pursue upper level science courses (Fraze, Rutherford, Wingenbach, & Wolfskill, 2011). In addition, middle school students who engaged in group STEM activities demonstrate more self-efficacy in STEM fields (Brown, 2016). Formal and nonformal education can benefit from hands-on, experiential learning during the middle school years to cultivate interest and aspiration in agricultural sciences later in career and academic choices. Stemming from this idea, *Project PLANTS* was created to increase students' excitement for the sciences, elevate students' image of agriculture from gardening to the dynamic scientific field it truly is, and connect middle school students to higher level education and industry opportunities in [State].

How It Works

Project PLANTS (Planting Leaders in Agriculture and Nature Through Science) was created through a collaboration between [Land-Grant] University and the [Named] Arboretum. *Project PLANTS* is a two-part program that immerses students in an intensive one-week summer camp program broadening their knowledge of agricultural sciences followed by a monthly *Science Saturday* program that extends their exploration through the school year. The camp provides a broad and engaging introduction to relevant and meaningful topics in agriculture. Each day unfolded with a different conceptual theme in STEM and uses an agricultural lens to strengthen science understanding for youth. The camp includes a series of field trips that presented *Project PLANTS* youth to various community leaders in agriculture as well as sessions led by [Land-Grant] faculty and graduate students. Instructional materials for the camp are a complementary blend of newly developed materials related to the current interests of youth and program staff as well as existing 4-H curricula. Leveraging middle school youth's desire to learn socially, *Project PLANTS* members were challenged to work together as teams and draw from their camp experiences to design projects that solved problems critical to conserving our natural resources. In addition to improving attitude toward sciences, *Project PLANTS* aims to foster

connections between participants and both universities and the agricultural industry. Students participate in hands-on learning that weaves life skills development into sciences and research.

Results to Date/Implications

To-date, over 50 participants completed the *Project PLANTS* program. Participants were divided into three cohort years. The first *Project PLANTS* cohort began in summer of 2015, with 11 participants attending a fully-funded camp and six to seven attending the monthly after-school club. In 2016, 19 participants attended the summer camp and 12-15 attended the weekly after-school club. In 2017, 19 participants attended the summer camp and 12-19 attended the monthly Science Saturday program. In 2018, 18 participants attended the summer camp. Participants originate from more than 20 different middle schools in [] County. Project coordinators recruited participants by contacting science teachers in local schools and asking for students to participate. After the first year, word-of-mouth helped with recruitment along with on-going contact with the schools. Participants completed an application that required a teacher or other adult mentor recommendation. Throughout *Project PLANTS*, and the four different cohorts who finished the program, project coordinators have observed a growing interest in horticulture and agriculture. Perhaps more interestingly is how these participants invested in each other and created an environment excitement for learning. Now at the end of four camps and three school years, project coordinators continue to be encouraged by the program and the relationships they are building with middle school participants. Participants are sharing their experiences, bringing friends for *Science Saturdays* and returning—39% of the 2017 participants returned for 2018.

Future Plans/Advice to Others

Project PLANTS has strengthened the programming capacity of [State] 4-H to deliver engaging, high-quality agricultural content to middle school youth. For the [] Arboretum, *Project PLANTS* launched an experiential, place-based program offering for middle school youth. *Project PLANTS* allowed project coordinators to be innovative, try new ideas, build and improve programming, and plan for sustainability. *Project PLANTS* experiential learning activities are being turned into a 4-H curriculum aligned to [State] Essential Standards to be available for formal and nonformal educator use, and those activities will be used for future *Project PLANTS*.

Clearly, middle grades students desire social interactions with one another. A critical component of *Project PLANTS* is social interactions. When implementing a program for middle school participants to build their confidence and interest in science, program planners should create social opportunities where participants can realize their potential as leaders and spread the seeds for lifelong engagement in agriculture.

Costs/Resources Needed

The Burroughs Wellcome Fund selected *Project PLANTS* as a recipient of the Student Science Enrichment Program grant with $179,884 total across three years to fund supplies, staff, transportation, marketing, and any other necessary costs. Now, the [] Arboretum has committed to continue *Project PLANTS* as one of its permanent program offerings. Using the experiences, activities and field trips, the [] Arboretum will be able to sustain *Project PLANTS* for the foreseeable future with an affordable cost to participants—$300 per student for the summer camp and $10 per *Science Saturday* to cover supply costs, food, marketing, transportation, field trip fees, t-shirts, and other costs.

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Putting the "Pro" in Program: Facilitating Preservice Teachers' School-based Agricultural Education Program Development Competencies in a Youth Program Development Course

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Putting the "Pro" in Program: Facilitating Preservice Teachers' School-based Agricultural Education Program Development Competencies in a Youth Program Development Course

Introduction

School-based agricultural education (SBAE) programs are designed to provide a wealth of opportunities for students through classroom and laboratory instruction, leadership development and organizational involvement (e.g., FFA), and enriching out-of-classroom experiences that build upon and apply prior knowledge (e.g., Supervised Agricultural Experience [SAE]) (Phipps, Osborne, Dyer, & Ball, 2008). As such, SBAE teachers are expected to be prepared to grant such prospects for students (Phipps et al., 2008). Teacher preparation programs are responsible for ensuring that preservice teachers are adequately prepared to enter their own SBAE programs as inservice teachers (Whittington, 2005). Agricultural and pedagogical content are provided throughout the teacher preparation process to grant preservice teachers the knowledge and skills to effectively lead their future programs, and their future students (Rice & Kitchel, 2015; Whittington, 2005).

To help provide relevant professional development for preservice teachers, university-level coursework should be sufficiently aligned to maximize learning opportunities (Wells, Perry, Anderson, Shultz, & Paulsen, 2013). Learning opportunities provided through relevant, eye-opening experiences can help to better prepare future teachers for the realities in which they will shortly reside (Baker, Culbertson, Robinson, & Ramsey, 2017; Rank & Smalley, 2017). Further, as teachers are expected to fulfill many roles both inside and outside of the traditional three components of SBAE (Phipps et al., 2008), such as working with advisory councils to improve programming (Taylor et al., 2017), attending to assigned school-related duties (Phipps et al., 2008), and so forth, it is reasonable to presume that many of a teacher's roles cannot be learned through coursework along, but rather must be learned by performing the tasks in real time. One such role is youth program planning and development. Perhaps a real-world-focused approach delivered through a youth program development course could help to effectively prepare preservice teachers to grow into their future roles as SBAE teachers.

How it Works

Students enrolled in the Development of Youth Programs in Agricultural Education course at Tennessee Tech were charged with creating a new Agricultural Education program. To do so, the National FFA Local Program Success (LPS) guide was utilized. The steps outlined in the LPS guide and the tasks students completed for each are described below. The project culminated in a website that outlined each step and the data collected throughout the semester.

- Clarify the why: Considering concrete learning outcomes, potential employment during and after high school, possible sources of financial support, and school district policy for adding new program, students developed a coherent argument for developing a SBAE program.
- Define opportunities available: Students developed a list of opportunities available in AFNR (e.g., careers in the local/state community) and early post-secondary opportunities (i.e., articulation agreements and dual-credit) for students enrolled in SBAE.
- Develop community support: Students partnered with the local Chamber of Commerce to compile a list of all the local business directly or indirectly related to agriculture. They randomly selected several businesses and conducted a survey to gather information on

opportunities for employment students have during high school, skills they seek in potential employees, and career experiences they prefer potential employees to possess.

- Analyze the political climate: Students sought to identify the key political players in the school district. They were tasked with identifying decision makers, community influencers, the financial situation for the school district, and potential barriers to starting a SBAE program.
- Clarify state processes: Students worked with regional and state staff to determine the steps to initiating a new SBAE program, and other relevant information for program planning and implementation (i.e., state standards).
- Develop a task list and timeline: Creating a new SBAE program can take up to two years to get implemented. The students developed a task list and timeline with the following considerations: local school district approval timeline, budgetary approvals timeline, state approval timeline, and pre-enrollment timelines for students.
- Involve key people: Students identified key individuals who could assist in the development and execution of an action plan for creating a new SBAE program.
- Develop an advisory committee: Students identified an advisory committee that was representative of the local community, created goals and sample agendas for meetings.
- Develop a community campaign: Students created a campaign to advocate for the creation of a new SBAE program with messages catered to specific audiences (e.g., students, parents, administrators, local businesses).
- Determine the curriculum: Students developed a proposed curriculum for the new SBAE program based on data gathered from local agricultural-related businesses and student interest surveys (simulated with 100 students within the college).
- Present to the school board: Students compiled all their findings and products into a website and presented to a simulated school board, which was comprised of four faculty members and the department head. The students presented all their analyzed data from the community and the need to create the SBAE program.

Implications

The project proved to be an authentic way for preservice teachers to begin assuming the identity of a SBAE teacher via practical hands-on experience that will be beneficial when entering the profession. Anecdotally, the students regarded the course and project as eye-opening and real-world.

Future Plans & Advice to Others

The course and project will be revised and implemented again in the near future across two institutions. We plan to establish a detailed handbook for this assignment in an effort to save faculty time throughout the semester. We recommend other teacher preparation programs implement similar projects across the curriculum to expose preservice teachers to real-world situations.

Costs

The project itself did not have any costs directly associated but did consume a considerable amount of time for planning and providing background to local businesses prior to the preservice teachers contacting them. As a thanks to the individuals who represented our simulated school board, refreshments were provided for less than $25.

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Students for Cultivating Change: Developing Safe Environments for LGBTQ+ Students

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Students for Cultivating Change: Developing Safe Environments for LGBTQ+ Students

Introduction and Need

"As a result of certain conditions in his way of life, the farmer is said to develop a frame of mind characterized by introversion, provincialism, ... conservatism, and numerous other traits peculiar to the rural setting" (Landis, 1948 as cited by Haer, 1952). From this rural culture mindset, negative connotations of diversity and inclusion efforts exist, particularly relating to gender and sexual-minority identities. This rural culture may have an influence on a college of agriculture setting at a land-grant institution, where minority students do not have the same experiences as other students (Drape et al., 2017). To change this culture, administrators and recruiters must work to increase the enrollment of underrepresented minorities and underserved populations ([university president], Nov 2016) through increased inclusive practices to address the need for the increased number and diversity of highly trained professionals entering careers in the agricultural industry (National Research Council, 2009; NIFA, 2015). One minority group, LGBTQ+ rural identities are unique due to the historical need for them to navigate the cultural emphasis of urban and suburban cultural iconography for LGBTQ+ individuals, but little is known about rural LGBTQ+ youth (Gray, 2007).

The lack of outward representation of LGBTQ+ agriculture students in higher-education reflects the cultural assumption that these youths are not present in agricultural or rural communities (Gray, 2009). Study of the development of micro-cultures for LGBTQ+ youth at the postsecondary level indicates that experiencing a sense of belonging helped transform student experiences into the development of identity (Vaccaro & Newman, 2017). LGBTQ+ identity is influenced by sexual identity and outness, university messaging, meaningful social interactions with groups (Sadowski, Chow, & Sandlon, 2009) and authentic friends (Vaccaro & Newman, 2017), suggesting that contexts of the university, organizations, and friendships foster LGBTQ+ student growth. However, the researchers are unaware of any published literature on the role of higher-education organizations in supporting LGBTQ+ identities in Colleges of Agriculture and the resulting participation of LGBTQ+ individuals entering the agriculture workforce.

This innovative poster serves to advance the American Association of Agricultural Educations' Research Priority Area 3: Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century (Stripling & Ricketts, 2016). The authors propose a formation of a club that supports partnerships among different groups including allies to the LGBTQ+ community, therefore increasing the awareness of the multidisciplinary and challenging nature of agriculture for LGBTQ+ individuals. This club will not only increase the diversity of the postsecondary agricultural student population but also strongly support more LGBTQ+ individuals, resulting in their greater participation in the agriculture workforce.

How it Works

Initially, a group of individuals gathered to talk about how to start a club, Students for Cultivating Change. From the meeting, an application for funds was submitted to the College of Agriculture's Diversity Council to support a guest speaker. Money from this internal grant spurred two initial public events: the original guest speaker and a panel discussion. The panel was a facilitated conversation with members from the [University] College of Agriculture community, including undergraduates, graduate students, and alumni from a wide range of academic departments, gender, racial and ethnic backgrounds, and sexual orientations. The speaker was a [University] alumni with significant success in the agricultural industry. After both formal programs, the organizers held interest meetings to discuss the formation of a club that would promote the presence of LGBTQ+ individuals in agriculture. An organization meeting

was held, inviting all past event participants. Formal club goals were established and officers elected. Officers worked with the [University] to officially recognize the club as a campus organization, and as such gain access to university resources for student groups.

Results to date/Implications

The student panel and speaker were designed to engage the broader College of Agriculture community, including allies and others in the agriculture field. Attendees and number of repeat participants are shown in Table 1. LGBTQ+ Awareness Events and Activities. Interest from students at the [University's] College of Agriculture is evident by the number of attendants at the initial events. Club participation has remained steady, with a core group of six student and faculty participants attending all of the events.

Table 1

LGBTQ+ Awareness Events and Activities

Event Name	Attendance #	Repeat attendance #
Panel discussion	33	n/a
Speaker	28	12
Initial organization meeting	9	8
First official meeting	12	8

Students for Cultivating Change (S4CC) at [the university] is now the second student club of its kind and serves undergraduates, graduate students, and faculty/staff with a mission to advance LGBTQ+ issues in agriculture and natural resources. The discussions at the community panel and speaker presentation were focused on LGBTQ+ identity awareness, ensuring that allies and other community members were welcome to attend. At the initial organization meeting, members voted to include allies within the mission of the club, however; only two self-identified allies (one faculty advisor and one student) have joined the club thus far.

S4CC at [the university] is in its infancy. It is clear from participation that students and faculty are interested in raising awareness of LGBTQ+ issues in agriculture and in investing in an organization for current and future students. The researchers have received anecdotal feedback from participants that seeing LGBTQ+ symbols, like the rainbow flag in the College of Agriculture, made them feel at home. This initial feedback supports the need to investigate the importance of raising awareness of LGBTQ+ individuals and issues in the agricultural field.

Future Plans

Meetings and events have continued into the current year with focus from the student executive team on cross-organization relationships with LGBTQ+ specific and non-specific clubs at [the university], reinforcing the idea that while friendship and organizational support are important, a wider university system is also necessary for student growth. As such, the research team will conduct future research into perceptions of LGBTQ+ organizations within an agricultural context at the university level to understand experiences of LGBTQ+ students and faculty in academic and industrial agriculture.

Costs and Resources

Limited costs including travel for the guest speaker and food at events were incurred during the formation of the club and were covered primarily by the College of Agriculture's Diversity Council. For other universities looking to form a similar organization, items such as a campus level LGBTQ+ Resource Center or umbrella organization, as well as financial and administrative support from the college of agriculture are key to provide students a safe platform to build friendships and organizational networks.

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Teach Ag Digital Escape Room

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Introduction

School-based agricultural education (SBAE) programs have been in existence since the early 1900s. Hillison (1987) identified the shortage of qualified teachers dating back to the Smith-Hughes Act of 1917. A century later, the demand for SBAE teachers continues to grow (Ingram, Sorensen, Warnick, & Lawver, 2018) and filling those positions has been a prolonged struggle (Smith, Lawver, & Foster, 2018). The *2017 Agriculture Teacher Supply and Demand Study* (Smith et al., 2018) reported an all time high of 75% (n = 556) of agricultural education graduates entering the SBAE profession. However, 462 positions were left to be filled by alternatively certified or non-licensed teachers along with the closure of over 120 programs nationwide (Smith et al., 2018), leaving an estimated 48,000 secondary students without a highly qualified SBAE instructor (NAAE, 2018). With the increasing demand for SBAE teachers, the need to further develop interest and increase capacity becomes even more apparent.

The National Teach Ag Campaign, through direction from the National Council for Agricultural Education and the National Association of Agricultural Educators, initiated a National Teach Ag Day to be celebrated on the third Thursday of September to "encourage others to teach school based agriculture and recognize the important role that agriculture teachers play in our schools and communities" (NAAE, 2018). To accomplish these objectives and to engage the freshmen and sophomore agricultural education students, a goal identified by the faculty of Oklahoma State University, graduate students designed a Teach Ag Digital Escape Room as the centerpiece of Oklahoma State University's National Teach Ag Day celebrations.

Escape rooms implement game-based learning in a fun active learning method (Kinio, Dufresne, Brandys, & Jetty, 2018). Game-based learning, or gamification, is designed to engage learners in motivational situations that require application of previous knowledge, problem solving skills, and teamwork (Adams, Burger, Crawford, & Setter, 2018). Game-based learning has been shown to increase student motivation and engagement in the curriculum (Bunch, Robinson, Edwards, & Antonenko, 2014). As a method of game-based learning, escape rooms require students to solve puzzles and complete tasks which activate their content knowledge so that they may "escape" the room (Adams et al., 2018). With the potential to further engage students (Kinio et al., 2018) and encourage critical thinking (Adams et al., 2018), a Teach Ag Digital Escape Room was implemented at the Oklahoma State University Teach Ag Night.

How It Works

For National Teach Ag Day, the Oklahoma State University Agricultural Education students in their first or second year were invited by email to participate in *Teach Ag Night*. To incorporate a fun and active learning experience for the attendees, the Oklahoma State University graduate students and faculty planned an Escape Room. The Escape Room pitted groups of students against each other in four identical rooms and challenged the teams to be the first to escape. The objective was to foster a structured environment for students to compete but also learn about the opportunities and resources available to them as future SBAE teachers.

After researching other game formats, including some very expensive pre-made escape room kits, the Oklahoma State University graduate students decided to develop Google Forms with

data validation to make the game both cost effective and easy to replicate for multiple rooms. Digital escape rooms also require less storage, as the props and tools needed to build a traditional escape room can be bulky and difficult to store.

Using the Google Forms platform, a series of 10 clues were developed that challenged students to work together as a team to solve the clues that helped them to "escape" the room. The clues ranged from FFA history to National Agricultural Education Supply and Demand Study statistics. With use of the data validation tool on Google Forms, students were forced to answer each clue correctly before they could move onto the next clue. In addition, iPads were placed in guided access mode so that the students could not leave Google Forms.

Students were split into groups and placed in different rooms. Four rooms had been prepped to contain the same materials and iPad needed to solve the puzzles and escape. A graduate student served as the gamekeeper to guide students if they struggled with a particular clue.

Results to Date

The students who attended the Teach Ag Night were excited to learn about opportunities as future agricultural educators. Each group was successful in escaping their room. Groups reconvened for pizza and a debriefing session. Students commented that they enjoyed the challenge and were introduced to several SBAE teacher resources, such as the Oklahoma Agricultural Education Teacher and Staff Directory. The game was made more relevant by incorporating clues as talking points for the debrief. The night was a success on all levels.

Future Plans

To meet the continued need to include freshman and sophomore students in the department, it is planned to include the Oklahoma State University Teach Ag Night as an annual event. Furthermore, changes to the increase the rigor, including the addition of other clues and more complex puzzles, remains at the forethought of the gamemakers. Finally, it is also planned to develop prizes specific to the Digital Teach Ag Escape Game such 'I ESCAPED' stickers, t-shirts, etc.

Costs/Resources Needed

Approximately 25 hours were spent on developing the digital escape room. The resources needed for this Escape Room were various props found around the department and/or acquired from promotional materials. As the Digital Escape Room was based within Google Forms, there was no need to purchase any additional escape room elements (locks, lockboxes, etc.). Participants had access to department owned iPads, which were purchased for use in undergraduate courses. The largest resource included the printing and organization of clues, including printing full color on heavy cardstock. The resources used for this escape room were saved for future implementation.

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The edTPA Planner: Providing a Roadmap for a High-Stakes Performance Assessment

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Introduction/Need for Innovation

In an effort to provide a more standardized assessment of student teacher competence upon entering the profession, an assessment tool known as the Educational Teacher Preparation Assessment (edTPA) was created by the Stanford Center for Assessment, Learning, & Equity (SCALE). With the use of detailed plans, videoed instruction, and evidence of student work (Darling-Hammond, 2012), the edTPA portfolio addresses planning, instruction, assessment, reflection, and academic language to reveal the competence of the teacher candidate (SCALE, 2014).

Research has identified several challenges to preparation for and completion of the edTPA through teacher education coursework and the student teaching experience. When asked to provide suggestions on types of support that could assist in the completion of the performance assessment, participants identified advising/support, modeling, early introduction to PACT, and mentorship (Okhremtchouk, Newell, & Rosa, 2013). Other research has noted similar needs and suggested teacher educators can assist students by scaffolding the components of the edTPA and providing formative feedback throughout teacher preparation coursework (Okhremtchouk, Seiki, Gilliland, Ateh, Wallace, & Kato, 2009).

At NC State University, the edTPA was piloted by the first group of agricultural education student teachers in spring of 2014. As of spring 2017, the edTPA is a high stakes teacher assessment in which student teachers must achieve a cut score designated by the Department of Public Instruction in order to receive teacher licensure. Due to the high-stakes nature of the performance assessment, ongoing dialogue has been used with student teachers to obtain feedback and suggestions to inform and improve the edTPA process used in future student teaching cohorts. Due to repeated requests to introduce the edTPA earlier in the progression of the teacher education coursework, as well as help students make linkages between course content and assignments to components of the edTPA tasks, the edTPA planner was developed and implemented.

How it Works

An agricultural education faculty member and graduate student who had recently completed the edTPA created a list of all the professional education core courses required in the program. Then using knowledge of the courses and edTPA requirements, an organizer was started to help guide students in making explicit connections between course content and expectations of the performance assessment. At the conclusion of this initial development, the document was distributed to other teacher education faculty to obtain their input specific to their courses. An example from the sophomore level Introduction to Teaching Agriculture course is included in Figure 1 below.

<u>Introduction to Teaching Agriculture</u>

- ❑ Collect lesson plans to be used as a resource in the development of your lesson plans.
- ❑ When reflecting on teaching performance, note specific time points in videos that are examples of strengths and/or areas for improvement.
- ❑ Start working on Theory/Research Table (see Figure 1).

Theory	Researcher	Description	Applications in Ag Ed

Figure 1. Excerpt of edTPA Planner – Introduction to Teaching Agriculture

In addition to including specific linkages between education courses and the edTPA, more general linkages were included for preservice teachers to observe and document in all their college coursework (see Figure 2).

All Coursework

- Note terms that are commonly used that may be confusing or new to your students (remember academic vocabulary from AEE 206)
- Be aware and consider when the following language functions are used in your classes:

Analyze	Argue	Compare/contrast	Construct	Describe	Explain
Evaluate	Hypothesize	Interpret	Predict	Summarize	Synthesize

Figure 2. Excerpt of edTPA Planner – All Coursework

Results to Date

The edTPA planner was introduced and distributed to students enrolled in the *Introduction to Teaching Agriculture* course in Fall 2017 and also to some of the senior-level students who were preparing for student teaching in Spring 2018.

Future Plans/Advice to Others

When using a document such as the edTPA planner, it is important to consider the best approach to introducing and integrating into course content. In Fall 2017, it was introduced in a stand-alone lesson near the end of the semester which seemed overwhelming and caused some unnecessary stress amongst the students. It is recommended that components of the planner be implemented throughout courses with course instructors highlighting linkages to the edTPA. Additionally, instructors should encourage students to complete sections that correspond with the courses they are teaching.

As student teachers complete the edTPA, their ideas and suggestions will be collected to continue developing and refining the edTPA planner for use by future cohorts. As the edTPA planner becomes more seamlessly integrated into teacher preparation courses, best practices will be identified for implementation and format of the document.

Costs/Resources Needed

Costs and resources needed for the implementation of this innovative idea were minimal. Time was needed for review of the course content, edTPA handbooks, and other available edTPA resources offered by the College of Education. Additionally, about two hours of class time in the Introduction to Teaching Agriculture course was needed to overview the edTPA and introduce the edTPA planner.

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The Impact of Social-Academic Experiences on In-Class Engagement

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The Impact of Social-Academic Experiences on In-Class Engagement

Introduction

Innovations in education technology are enabling the classroom to become more globally diverse through the use of varied instructional design (Aragon, Johnson, & Shaik, 2002). As the demand for more synchronous and diverse learning environments increases, the lack of connection between on-campus graduate students and those enrolled as working professionals at a distance remains an issue (Park & Bonk, 2007). In a study to understand the avenues of communication among undergraduate students, Emanuel et al. (2008) discovered listening and speaking accounted for 71.5% of engagement in communication while reading and writing only accounted for 28.5% of the engagement among students. This suggests that face-to-face communication and engagement may enhance the learning environment.

To increase engagement academically, involvement within academic-related discussion and community is necessary (Salanova, Llorens, & Schaufeli, 2011; Strauss & Terenzini, 2007; Wilson et al., 2014). A lack of a sense of community and feelings of disconnectivity often have been expressed as challenges to online learning among students (Park & Bonk, 2007). Creating the connection between on-campus and distance students in an academic setting is important to increased self-efficacy, particularly among graduate students (Strauss & Terenzini, 2007; Wilson et al., 2014).

Not only does connectedness increase the self-efficacy of students, but it can increase academic performance as well because students are involved within an academic learning community (Wilson et al., 2014). Within the University of Georgia, a disconnect between graduate students enrolled in online courses has been noticed. Social-academic activities aimed at remedying the disconnect among students seem to be enhancing graduate student performance and engagement in distance-delivered courses at the University of Georgia. However, additional evidence is needed.

Methodology

Initially, a pre-existing connection between a small contingency of graduate students (five to seven students) was necessary. These students championed the effort to create the social-academic environments and even recommended that this model be shared at a professional conference. These students reached out to other graduate students via email and connected them onto a GroupMe message. The use of this application is common on college campuses and allows for instant brief communication. Following the initial communication from the pre-

existing group of graduate students, the group planned out-of-class group activities aimed at developing discussion and invited any on- or off-campus graduate student to attend.

Results to Date

Prior to the first out-of-class social-academic activity (a trivia night with graduate students on- and off-campus), graduate students enrolled in various synchronous learning courses appeared to be less engaged and uncomfortable introducing diverse discussion topics that have the potential to damage their online reputation. Based on observations, how students are perceived in an online format is greatly impacted by the inability to put a 'name to a face' for other students in the class. This seems to have resulted in a lack of trust and increased vulnerability that has prompted disengagement and poorer quality posts in response to each assignment. After the first social-academic activity, students appeared to have more interaction on discussion boards. This increase in engagement was both in the depth of discussion and in the range of responses to multiple peers.

Future Plans

In depth interviews are planned with faculty who teach online, synchronous and asynchronous courses to on-campus and off-campus students. These interviews will provide additional data useful to uncovering whether social-academic activity participation involving students at a distance meeting face-to-face with on-campus students influences academic growth beyond the depth of discussion board posts. Interviews with students will also help to better understand why their posts get more elaborate and whether they feel more comfortable communicating with their peers online after meeting in person. Furthermore, the distance education technology will be used to track how often students are posting and for how long they spend online engaging with their peers before and after participating in extracurricular, social-academic activities. Similar graduate programs with on- and off-campus students are encouraged to use existing departmental or college-level Graduate Student Associations to facilitate social and professional development events for graduate students. While faculty participation in such events is never prohibited, graduate students often respond more favorably to events in which only their peers are in attendance.

Costs/Resources Needed

Minimal costs are associated with this innovative idea. The primary methods for communication are face-to-face, GroupMe, and Email, as necessary. These communication methods are free to use. Specific social-academic activities are not monetarily sponsored by the respective institution or department and are the sole financial responsibility of those graduate students participating.

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Tools and Techniques for Revising a State Extension Performance Appraisal System for Extension Agents, County Directors, and Area Extension Specialists

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Tools and Techniques for Revising a State Extension Performance Appraisal System for Extension Agents, County Directors, and Area Extension Specialists

Introduction/Need

Appraisal, as a social phenomenon, is a basic human behavior of evaluating the work performance of oneself and others (Dulewicz, 1989). Performance appraisal is a process of interpreting and measuring the degree of effectiveness, standards achieved, or performance goals met (Bernardin & Beatty, 1984). In Cooperative Extension, performance appraisal has received limited attention among researchers. Davis and Verma (1993) linked extension agents' views of their numeric performance appraisal to the agents' perception of the ideal performance appraisal system in a seven-state study of 602 agents. They found that agents' identify ideal performance appraisal as one in which their appraisers had adequate instruction, and the agents' plan of work was incorporated into the appraisal.

A survey of 218 Tennessee Extension Agents found that the vast majority (78.9%) agreed that their performance appraisal system needed to be improved. Recommendations included a performance appraisal rubric more accurately reflecting the job and increased professional development for County Directors who rate Extension Agents' performance (Donaldson & French, 2013). In response to this research, a two-year initiative was established to revise the performance appraisal system used by the University of Tennessee (UT) Extension and Tennessee State University (TSU) Cooperative Extension Program. The performance appraisal form produced by this initiative became the first such document jointly approved by Extension administration, general counsels and human resource departments of the University of Tennessee and Tennessee State University.

Process

A team of 16 UT and TSU Extension personnel representing county, regional, are departmental offices conducted numerous studies to select performance factors, criteria, and descriptions. A document review was completed. A faculty member used random number generator for random selection of 73 Extension Agents, 26 County Directors, and 6 Extension Area Specialists. The job descriptions and position description questionnaires of the selected individuals were copied from official University personnel files for study. This document review ensured that performance factors and criteria reflected the actual Extension professionals' jobs. The team also reviewed the performance appraisal forms used by five peer institutions. In addition, a focus group of nine high-performing Extension Agents and County Directors (selected by Regional Directors) reviewed the criteria and provided feedback.

Results to date/Implications

This initiative created a number of tools and techniques to inform similar efforts in other states. Broadly, the tools and techniques may be grouped as instrumentation and instructional. Regarding instrumentation, a performance appraisal form and a performance appraisal rubric were created. The rubric delineates performance factors and performance levels for five categories: 1=Unsatisfactory, 2=Needs Improvement; 3=Meets Expectations, 4=Exceeds Expectations, and 5=Exemplary (Donaldson, et al., 2016). The instructional tools are:

- Executive Summary – The initiative's Executive Summary provides an overview of performance appraisal in society and in Cooperative Extension. This publication also

describes the Performance Appraisal Revision Committee's major objectives and recommendations for assessing performance (Donaldson, et al., 2017).

- Appraisal Guide – The *Appraisal Guide for the Tennessee Extension Performance Appraisal System* is a 57-page guide that provides information for employees and supervisors. Sections include roles and responsibilities for conducting the appraisal; establishing goals for the coming year; reviewing goals and progress toward those goals from the past year; assessing performance; and understanding low performance. This guide provides practical tools such as a checklist for County Director to use in coordinating the appraisal process at the county level (Donaldson, 2017a).
- Case Studies – The *Case Studies for Assessing Performance Facilitation Guide* is a 26-page guide that details employee case studies and how the appraisal system reflected the employees' performance. This is an important tool for creating consistency among different Regional Directors and County Directors (who each have roles as raters) because a rater can compare his or her answers to the standard rating for a given scenario (Donaldson, 2017b).
- Regional Workshop Materials – One-day, regional workshops introduced the revised Tennessee Extension Performance Appraisal System. These workshops were taught by Regional Directors using standard lessons plans, visuals, and handouts (Donaldson, 2017c).

In Tennessee, all of these tools supported successful implementation of the new performance appraisal system. This project provides a number of implications and ideas for effective performance appraisal of Extension professionals. The project underscores the importance of a written guide (available online) coupled with face-to-face learning opportunities with peers and supervisors. The instrumentation is critically important and the instructional materials that help employees consistently and accurately use the instruments are just as important.

Future plans

Research is needed to identify best practices, including instruments and processes, in performance appraisal for Extension Agents. This is particularly important given the small research base in extension agent appraisal. Using the preliminary documents from this Tennessee initiative, the University of Arkansas adapted, with permission, the performance factors and criteria (2016). Research to understand how the appraisal systems are performing in both Tennessee and Arkansas is needed. Due to the importance of performance appraisal and its effect on the workforce, researchers are working to identify extramural funding to conduct intensive performance appraisal studies, including how performance appraisal may influence, if at all, effective education and community engagement.

Costs/resources needed

One Agricultural and Extension Education faculty member with expertise in program evaluation, organizational change, and performance appraisal coordinated the project. The two-year effort had a $107,000 budget of state-designated Extension funds that supported: (a) the tuition, health insurance, and salary of one graduate research assistant working 20 hours per week for two years; and (b) mileage, meals, and lodging for 16 committee members to participate in five face-to-face meetings (two days each).

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Using 360-Video for Teaching Performance Reflection

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Using 360 Video for Teaching Performance Reflection

Introduction

Teacher education programs employ several methods in their quest to develop effective teachers who are reflective practitioners. One such method is the use of microteaching, a concept introduced in the 1960s by the Stanford University teacher education program (Kallenbach & Gall, 1969). The specific format and application of microteaching in teacher education programs varies but has been shown to aid in the development of expertise and minimizes the risk of failure in a real classroom (Wahba, 1999). Such results are not achieved through microteaching alone, but through reflection on the microteaching experience. For teacher development, reflection is essential (Schon, 1983). Recording microteaching provides teachers the ability to critically review their performance to identify strengths and areas for improvement. Additionally, the recording allows teachers to "more effectively see their practice" (Tripp & Rich, 2012, p. 676), is an effective method for the improvement of teaching skills (Penny & Coe, 2004), and allows preservice teachers the opportunity to make thoughtful decisions for continuous improvement and the development of effective teaching strategies (Ismail, 2011). Additionally, using recordings assists in developing teachers' abilities to "reflect in practice" (p. 679) during future microteaching/teaching experiences (Tripp & Rich, 2012).

Specific software and hardware solutions have been developed for classroom video to streamline teacher coaching and reflection. One such platform is EDTHENA and operates on subscription/licensing fees. Additionally, a video-capable device (i.e., smartphone/tablet) is needed to capture the video. Once captured, the video is uploaded into the system for feedback from others or oneself. Another solution is Swivl, which requires a tablet to be placed into a cradle that tracks and rotates a transmitter worn by the teacher (Franklin et al., 2018). The resulting video is uploaded to the Swivl platform for reflection and analysis by the teacher or others. However, each of these solutions have attached costs; which was the largest barrier for adoption in the teacher education program at Tennessee Technological University (TTU). Video capture technology has advanced rapidly in recent years. The two platforms outlined above still rely on standard video capabilities. In recent years, 360-degree video cameras have become commercially available. Recording in 360-degree video captures the entire environment and allows an individual to see what standard video devices don't/can't capture. Could 360-degree cameras be useful for facilitating teacher reflection?

How it Works

A 360Fly camera was mounted to a tripod and set up in the middle of the classroom for microteachings in a methods of teaching course. The 360Fly smartphone application was installed on the instructor's smartphone and was used to start and stop the recording for each student. Immediately after the class, the instructor uploaded all captured content to a computer and prepared it for upload to a private YouTube channel created for the class. Each student's microteaching was uploaded as an individual video. Students were notified once the videos were uploaded so they could review and begin working on their reflection. Students were encouraged to watch the video through and adjust the orientation of the video if warranted. Students have the ability to click and drag or use directional arrows to change the orientation of the video.

Results to Date

Students in the methods of teaching course at Tennessee Tech had positive reactions to the 360 videos. Several mentioned the benefit of being able to adjust the video orientation to identify any potential issues in areas of the learning environment not traditionally captured in standard recordings. This navigation ability allowed them to see all areas and made them aware of areas they should monitor more via proximity while teaching. Anecdotally, a couple of students noted that adjusting the orientation when viewing recorded group activities was slightly cumbersome but was worth the extra effort.

Additionally, several students mentioned that they could see this technology being implemented in other ways for their future programs. For instance, one student noted the possibility of capturing virtual field trips in 360-video for students to explore. Another mentioned using a 360-video camera for identifying different building layouts used in agriculture (swine buildings, chicken houses, etc.). They discussed the possibility of developing a YouTube playlist with several 360-videos to be utilized in their future classes.

Future Plans/Advice to Others

The 360-degree recordings will be implemented in methods courses at Texas A&M in the Spring of 2019. Faculty members in the teacher preparation program plan to develop a study on the impact of microteaching capture in 360-video versus standard video. Additionally, the authors are planning a project focused on developing immersive experiences in 360-video within various sectors of the agriculture industry for use in secondary and post-secondary programs. For those interested in using a 360-video camera for microteaching capture, it is recommended that one invests time learning how to operate the camera and software prior to implementation.

Cost/Resources Needed

The 360Fly camera utilized in this instance cost $499. The tripod was already available, but one could be purchased for $30 or less from any major retailer. The instructor used a personal smartphone for camera control. A tablet would also work to control the camera. If neither a smartphone or a tablet is accessible, that cost would need to be factored in as well. Creating a private YouTube is free of charge but does require a small investment of an instructor's time to initialize. Time to upload the 360-degree videos should be factored in as well.

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Using a team-based online simulation to promote undergraduate student learning outcomes in a course on communication and leadership in groups and teams

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Introduction:

Current literature across disciplines indicates that undergraduate students prefer to learn using online game-like simulations and that student performance can be improved when taught using simulations in comparison to traditional lecture or problem based learning approaches. (Anderson, 2005, Bodnar, 2016, Seybert, 2007, Steadman, n.d.) In an effort to enhance student learning outcomes, faculty at the University of Florida introduced the Recurrence Signature Case Study (RSCS), an online team-based simulation, to the course AEC 4434: Communication and Leadership in Groups and Teams (39 students, Fall 2018). The goal of the RSCS is to use a game-like simulation to provide real world exercises where students are required to make a series of interdependent decisions as a group. These decisions generate a series of cascading crises that require a team of five students to work closely together to resolve satisfactorily. This study seeks to demonstrate how an online simulation can assist undergraduate students in learning to work effectively and collaboratively in groups and teams. Through surveys, simulation performance, and overall class performance, we hope to show that students prefer the simulation over traditional assignments, perceive better learning outcomes because of participation, perceive stronger interpersonal bonds with group members, and that performance in the simulation positively correlates to overall course success.

How it works/methodology/program phases/steps:

The RSCS is a modern approach to the case study. This online, interactive, multiplayer experience allows students to lead a company through business challenges based on real-world data and actual events. This "gamulation" provides students with opportunities to solve problems, think strategically, understand key communication and leadership concepts, (Recurrence, 2018). The RSCS requires students to sign up for one of five positions on an executive board and each position must make a decision during four different exercises (or crises) that is influenced by previous decisions made by the rest of the group. In AEC 4434, the assignment is graded based on overall score from each activity. The score from each activity is determined by shareholder, customer, and employee satisfaction scores which are all impacted by student decisions during the simulation. Students are scored as a group, and teams that are able to collaborate effectively when planning their role decisions are expected to score higher than groups working separately. This point is emphasized in class through lecture, assignments, and team building activities. There are many factors that influence student learning outcomes in team assignments at the undergraduate level, including formal reward structures, limited assignment duration, and personality conflicts. (Clinebell, 2003). To mitigate these adverse influences, faculty in the course spend the first 6-8 lectures conducting personality assessments, setting up assigned teams intentionally, and specifically work to build team cohesion through graded assignments and in-class activities. Student groups are not required to submit their first two RSCM exercises until the midway point of the semester, with the hope that effective conflict resolution strategies and defined team roles should have time to form. An IRB approved survey will be administered to understand student perceptions of the RSCS experience once the final

exercise has been completed. This survey data will be compared to overall course and RSCM performance to determine the effectiveness of the simulation.

Results to date/implications:
The RSCS has been facilitated over the past two years in an introductory leadership course with students who are minoring in innovation at the University of Florida. As a semester-long group project, Students were put into random groups and were asked to go through the program together and reflect on their experience at the end of the semester. One of the major themes that emerged from the students' reflections was how much they appreciated the collaboration aspect of the project and how it affected their leadership development. For example, one student remarked, "what [the program] teaches us about leadership is that everyone's personality comes together to bring a diverse opinion and style, which contributes to the final result." Furthermore, another student mentioned "I learned that you, even as a leader, don't have to make decisions completely alone and that it can be beneficial to have multiple opinions when making a big decision." Another important finding from the Recurrence program were certain leadership skills students developed such as communication and problem solving. For example, one student said that their team, "Developed communication skills, negotiation skills and problem-solving skills." Moreover, another student remarked, "We narrowed down to the best decision by problem-solving and communicating with one another. Essentially, we learned the basis of leadership by learning each of our skills from one another."

There are many implications of these initial findings, but most importantly, the students actually articulated that their leadership capacities were developed. It has long been disputed whether or not leadership development programs actually accomplish what they propose (Kellerman, 2012), however, this initial qualitative data shows that students believe they are developing their leadership capacities by going through this computer program. As with the nature of social science research, more data is needed, but the findings from this project suggest that the RSCS program is an effective way to develop students' leadership capacity through working in groups. On a larger scale, this program could be used in other agricultural leadership settings to assist students in their collaboration, communication and problem solving skills. Many of these skills will be needed as the world continues to become more complex and turbulent particularly in the agriculture and natural resources industry where the task of supplying food for a growing population expected to pass 9 billion by the year 2050 looms (Grint, 2010, Stedman & Andenoro, 2015).

Future plans/advice to others:
Future analysis of the RSCS on student learning outcomes should include a control group of students who do not participate in the online simulation. Additionally, future studies should engage multiple classes or classes with larger enrollment in order to collect more generalizable data. Finally, pre-simulation knowledge assessments could be provided to students at the start of

the course in both a control group and the experimental group to determine the simulation's ability to improve student learning outcomes beyond class performance as determined by GPA. Researchers and educators seeking to use the

Costs/resources needed:

- Recurrence Signature Case Study - http://recurrenceinc.com/university/
- The cost is $39.99 per student
- Educators should plan on using a 16-week (fall or spring) semester to take full advantage of the RSCS (summer semesters single quarter-credit courses are too time-limited).
- Educators should divide the class into teams and provide access and instructions for the RSCS as within the first two weeks of the semester, with a full day devoted to training students how to use the software.

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Innovative Idea Poster

Using Stories and Imagery to Impact Learning in a College of Agriculture

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Using Stories and Imagery to Impact Learning in a College of Agriculture

Introduction

The integration of storytelling and imagery can create a fun and positive learning experience. To be effective, instructors should implement and design classroom activities that utilize active learning strategies to improve student cognition and maximize student engagement (Conner, Rubenstein, DiBenedetto, Stripling, Roberts & Stedman, 2014). Miller, McNear and Metz (2013), suggest that to increase long term retention of subject matter in students, active and engaged pedagogies should be used (Baker & Robinson, 2013). Even when content is heavy with concepts and principles, teaching with a story can show a student the world through another's eyes. Staying engaged can be improved by implementing storytelling to add depth and understanding (Lann, Carter, Stedman, Lamn, 2014). Learning throughout the ages has relied heavily on storytelling to convey ideas, philosophy and cultural understanding (Abrahamson, 2011). This form of narrative communication has helped shape minds, build knowledge and extend deeper conceptual epistemology. Great teachers from Homer and Plato, through Jesus and Gandhi have used stories, myths, parables and personal history to guide student instruction and development (Zabel, 1991). Learning from stories can enable students to attach emotional meaning to contextual concepts and facilitate transfer of knowledge into long-term memory.

Although not new to instructional design, teaching with a story, frequently is not used in subjects with heavy empirical information and traditional descriptive content. Typically, transfer of knowledge in college undergraduate courses is accomplished through memorization, however, there is evidence to show that storytelling fits a High Impact Learning environment (HIL). Defined as learning activities that purposefully and systematically encourage students to create new knowledge, engage in critical thinking, explore new ideas and make connection with comprehensive curriculum, HIL can incorporate storytelling into positive student learning outcomes (Murphrey, Odom & Sledd, 2016). Research suggests that internal cognition increases when utilizing the story approach to remember concepts, facts and information (Yussen, Huang, Mathews, & Evans, 1988). Using narrative explanation and storylines has been described as a primary and irreducible form of human comprehension (Mink, 1978).

Adding an additional dimension of comprehension and emotion to the story is imagery. By using pictures or imagery in a lesson plan, a teacher can emphasize the intrinsic value and emotional connection to the material. More (1987), argues that the use of metaphors, images and symbols have always existed as a primary learning tool because humans "code with imagery" to remember and understand words and concepts. Therefore, the use of stories and pictures together provide mental recall and understanding of concepts and principles crucial to the content covered in a lesson. This curriculum attempts to add both story and imagery through videos in four teaching modules.

Some courses remain difficult to build student enthusiasm and interest, particularly when the content is traditionally heavy with definitions, principles and concepts. For example, *Introduction to Agricultural Cooperatives,* taught as an elective in an agriculture economics department, is a subject about which most college students have little to no understanding. Engaging them and creating an interactive environment is challenging, yet important to ensure students gain the maximum learning experience. To that end, a pilot curriculum was developed and employed to improve the level of student interest, interaction and content understanding.

How It Works

Four teaching modules were developed to teach agricultural cooperation principles and concepts. The curriculum covers the basics of agricultural cooperative history, purpose, structure, operation and economic impact. Using videos to tell the story about Charlie, a young cotton farmer, each subject section chronologically follows her journey and decision process to join a cooperative, benefit from her ownership and ultimately witnesses her success.

This innovative approach to teaching, begins with methodology for motivating student learning through storytelling and imagery. Storytelling is an important technique in the process of learning and understanding (Langer, 2016). Students gain a better understanding by connecting real characters in real world situations rather than using examples of abstractions and generalizations. Using Charlie's story to facilitate this technique enables students to gain greater perspective and knowledge of why cooperatives are important to the agriculture industry. Being mindful of powerful storytelling, this teaching approach and curriculum instills a breadth of colorful context and comprehensive understanding. Ultimately, the goal is to use the storytelling method to achieve student learning outcomes in each teaching module:

1. Why cooperatives are important in helping reduce costs and increase revenue to owner-members.
2. Introduce cooperative structure and operations.
3. Explain how cooperatives are managed and represent member interests through governing board.
4. Show how cooperative ownership helps producers invest in the food and fiber value chain and contributes to building local economies.

Results to Date

Currently, implemented as a pilot curriculum with 40 students, the story using video, handouts and activities is being introduced in an agriculture economic department at a [State] university. Each lesson plan includes, a video, introductory discussion, pre and post video reflective questions and an interactive activity. According to the instructor, the preliminary student feedback has been very positive and successful in helping increase interest and understanding of content.

Future Plan

Data will be collected to ascertain student satisfaction, engagement level and course understanding. From these results, the curriculum may be edited, changed or kept the same for future distribution and delivery to other classrooms. Additionally, plans involve the integration of the four modules into a community college economics' course. The curriculum will be delivered consecutively to two sections of four classes of undergraduate students. At delivery completion, a questionnaire will be administered to capture student satisfaction, engagement level, and knowledge attainment. This curriculum has broad audience appeal and can be utilized in 4-H or FFA programs to help educate younger students about agricultural cooperation.

Costs & Resources Needed

This curriculum will be made available for any instructor on a website link through [State] Extension Service. Resources will involve access to a computer and Internet.

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Mississippi Agriculture in the Classroom Program: Through the Lens of Educators

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Mississippi Agriculture in the Classroom Program: Through the Lens of Educators

Introduction

There is an ever-growing gap of knowledge and trust between agricultural producers and consumers (Giovannucci, Scherr, Nierenberg, Hebebrand, Shapiro, Milder, & Wheeler, 2012). This divide in agricultural literacy and firsthand experience in the agricultural industry may affect consumer perceptions (Specht, McKim & Rutherford, 2014). Through agricultural literacy efforts, such as the Agriculture in the Classroom (AITC) program, there is a significant decrease in the gap between producers and consumers (Pense, Leising, Portillo & Igo, 2005).

Through AITC, educators receive agricultural literacy materials from the local County Agricultural Literacy Coordinator or the local Farm Bureau offices, free of charge or available online, (National Agriculture in the Classroom, 2018). The agricultural industry provides real-life contexts for students to engage in experiential learning and apply what they learn in science, math, social studies, and language arts (Knobloch, 2008). Although research shows that agricultural concepts should be integrated into classroom instruction, there are several factors why teachers do not choose to integrate this subject into curricula such as being uncomfortable with the content (Moore, 1987), and not seeing the benefits (Knobloch, Ball, & Allen, 2007). There is not a lack of curriculum resources to assist teachers in integrating agricultural concepts into their classrooms, rather the challenge is how to shape these components into a deliverable, student-centered curriculum that align with state academic standards and make them available to educators (Bellah & Dyer, 2006). The purpose of this study was to gain insight on Mississippi's AITC program so more informed decisions about improving the program can be made.

Conceptual Framework

The theoretical framework guiding this study was Kolb's Theory of Experiential Learning (1984). Kolb believed that experiential learning was a "holistic integrative perspective on learning that combines experience, perception, cognition, and behavior" and could be applied to any educational setting (Kolb & Kolb, 2012). Kolb's theory has four parts: concrete experience, reflective observation, abstract conceptualization, and active experimentation. The AITC program follows this model in that it gives students hands-on experiences that provide opportunities to gain knowledge, reflect on their learning, and draw meaningful conclusions tied to real-world agricultural topics.

Methodology

The study consisted of telephone interviews involving a total of eight participants and were conducted from October 4-25, 2017. All participants were purposively selected based on their experience with the AITC program or similar programming. Each interview lasted 15 minutes to one hour and were semi-structured around a set of open-ended questions pertaining to their experience with the AITC program. We asked planned questions flexibly, allowing room for participants' more unprompted descriptions and responses (Brinkmann, 2014). During the process, we recorded and transcribed the interviews. When analyzing the interview transcriptions, we looked for repetition, linguistic connectors, similarities, and differences amongst responses (Bernard, Wutich, & Ryan, 2017). In order to reduce the amount of text to analyze, significant key fragments from each interview were marked then further organized into categories based on common themes through triangulation (Denzin, 1978).

Results

Upon interpreting the interview transcriptions, we found seven common themes: Mississippi lack of commodities focus, state curriculum standard linkage, grade level inclusivity, online availability, varied activities and lesson structure, effective teacher trainings, and publicity and promotion. Several respondents stated they would like to see the program focus on Mississippi's top commodities, since "it is important for our students to learn about products grown in our state" (R3; R6; R8). In regards to program materials, respondent 4 stated if they aligned with the Mississippi department of education curriculum standards, "teachers would be more apt to use them." In addition to making all program materials available online, all respondents agreed that there should be lessons appropriate for every grade level with varied lengths and structure. Finally, respondent 2 said that teacher trainings should "take place regularly in various locations around the state and give teachers the confidence to use program materials."

Conclusions

Previous research has shown that agricultural concepts should be taught to students (Pense et al., 2005), and this study found that educators feel it is important. Although the AITC program exists for this purpose (National Agriculture in the Classroom, 2018), program materials do not match the wants and needs of Mississippi's teachers. The AITC program has the potential to integrate agriculture into core subjects (Knobloch, 2008), but it fails to correspond with state curriculum standards, so teachers are not using the program materials. According to Moore (1987), teachers must feel knowledgeable about teaching agricultural content before they do so, and participants of this study feel teachers need more quality training before feeling comfortable using AITC program materials. It is important that program materials be readily available to educators (Bellah & Dyer, 2006); however, they are not easily accessible.

Recommendations

It is recommended that the Mississippi AITC program undergo a series of updates to meet the needs of students and teachers. The program curriculum should be revised to include Mississippi's top commodities. Lessons of different lengths, methods/techniques, and grade level appropriateness should be available. Program materials should be accessible online so teachers can easily acquire them. In addition, teacher trainings should be restructured to expand the reach of the program and include more in-depth training. Further research should be conducted to expand the breadth of this study to include more teachers, including those of different grade levels, geographical location, and AITC experience. In addition, a comparative study should be conducted to investigate AITC programs in other states.

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Research Poster

A Qualitative Needs Assessment of Arkansas Urban Agriculturalists

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A Qualitative Needs Assessment of Arkansas Urban Agriculturalists

Introduction and Frameworks

Actors within local food systems attempt to extricate themselves from the industrial agricultural model but face operational obstacles (Wight, 2013). Many alternative food system operations, such as urban farms, are integral to community-level work toward eradicating social issues, such as food insecurity (Lyson, 2004; Pettygrove & Ghose, 2018). The Cooperative Extension Service (CES) is uniquely qualified to assist these farmers with local food system development because of their position as a research institution providing programs and resources. While it is difficult to find a consensus definition of urban farming, as definitions vary based on the local context of urban operations, understanding and developing a local or regional definition affects the degree to which CES can assist farmers (Reynolds, 2011). Some definitions refer to community or personal gardens, some to growing for markets, others to local communities and social justice (Rogus & Dimitri, 2014). By investigating the needs, concerns and perceptions of Arkansas urban farmers, the researchers hope to develop a context of urban farming for Arkansas to assist CES in building relationships with and programs for this population.

This study aimed to determine program and resource needs of urban farmers based on recommendations from Harder, Narine, and Wells (2018) through a needs assessment. A needs assessment is a process involving information gathering about specific, demonstrated needs for a target population or community (Harms, Presley, Hettiarachchi, & Thien, 2013). This mechanism allows CES to involve community input prior to program planning and implementation (Webster & Ingram, 2007). This research aligns with the National Research Agenda for the American Association for Agricultural Education Priorities 6—Vibrant, Resilient Communities—and 7—Addressing Complex Problems (Roberts, Harder, & Brashears, 2016).

Blending the Community Food System Development Framework for Change (Perez, 2016) and the Agro-Ecological Educator Theory (Wight, 2013), this study provides a framework for CES personnel to better understand local food systems and urban farmers. Perez (2016) stated in her framework that community food systems relate to many community concerns because they operate under the structures of environment, policy, capacity, economy, culture, and public health. This framework, developed by CES personnel, advocates alternatives consistent with CES' mission to support local food movements. In the Agro-Ecological Educator Theory, Wight (2013) builds off Freire's (1970) seminal work, *Pedagogy of the Oppressed,* to contextualize the socially-minded efforts of local food movements, especially as they relate to food security. Wight (2013) focuses on the role of agroecology in these operations, and the effect of dialogical communication and praxis on positive relationships between institutions, such as CES, and local food actors.

Methods

The purpose of this study, which is part of a larger study, was to identify the needs of urban agriculturalists in Arkansas's urban centers to inform future program development for urban farming. The following research questions guided this study: a) What is the context of urban agriculture for Arkansas? and b) What are the resource and programming needs of urban farmers? The operational definition of urban agriculture used for this study was a small farm, fewer than 10 acres, located within city limits that actively engages with the market (NASS, 2014; Opitz, Berges, Piorr, & Krikser, 2016; Perez & McCullough, 2017; Rogus & Dimitri,

2014). This definition guided participant recruitment through snowball sampling where interviewees recommended future participants within their urban farming social network (Sadler et al., 2010). Interviews were conducted in late summer and early fall of 2018 in the Northwest and Central regions of the state due to the larger urban populations in those regions. By using a semi-structured interview protocol—developed by a committee of social scientists in agricultural and extension education, agricultural communication, and community and economic development—participants were able to respond to questions while also yielding emergent themes. Constructs in the interview protocol included definitions of urban agriculture, descriptions of operations and related concerns, perceptions of CES, and resource needs. Face and content validity of the protocol were determined by piloting and peer review, and trustworthiness was established based on the recommendations of Lincoln and Guba (1985). Interviews were transcribed and data analyzed for emergent themes. The researcher implemented thematic coding—open coding followed by axial coding to connect themes—to identify emergent themes.

Findings

Interviews were conducted with 16 urban farmers—eight in Northwest Arkansas and eight in Central Arkansas. Findings included concepts such as determining information sources for farmers, social networks, and definitions of urban agriculture. Five themes emerged from the interviews: (1) descriptions of desired role of CES; (2) descriptions of sustainable practices; (3) descriptions of community engagement; (4) perceived needs and concerns relating to operations; and (5) perceptions of CES. All interviewees had previous interactions with CES, to varying degrees, and rated CES as a resource for urban agriculturalists on average 3.2 out of 5. A local definition of urban agriculture, different from the operational definition, was developed for Arkansas as small-scale, diversified farming within city limits that engages with the market, the community, or both. Major concerns of farmers, which will inform future program and research planning, included accessing information about market pricing, sustainable and organic pest management, and creating contractual relationships with buyers in the area, but mostly urban farming needs were diverse and varied based on size, mission, and age of each operation. Thematic saturation did not begin until interview 12. Most farmers interviewed in this study had obtained a bachelor's degree and were white males between the ages of 28 and 35.

Conclusions and Recommendations

Identifying desired program needs and preferred learning techniques from participants will assist CES in building relationships with and programs for Arkansas's urban farmers. Preliminary findings supported the operational urban agriculture definition provided in the literature review; however, market engagement evolved to community engagement as many urban farms in Arkansas have educational and community outreach components. As recommended by Reynolds (2011), as local definition of urban agriculture was developed to assist CES in program planning for this population. Saturation did not occur until late in the interviews, thus urban farmers in the same regions demonstrated diverse needs. State CES organizations are encouraged to conduct needs assessments utilizing interviews with urban farmers to determine the local context of urban farming, farmer demographics, and modes of information sharing to develop high-impact programs. This research will guide the development of a survey with Arkansas county agricultural CES agents to determine their knowledge and perceptions of urban farming to triangulate gaps between CES and Arkansas' urban farmers.

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An Assessment of Agricultural Science Teachers' Knowledge of Biotechnology and Experience through Piloting New Biotechnology Curriculum

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An Assessment of Agricultural Science Teachers' Knowledge of Biotechnology and Experience through Piloting New Biotechnology Curriculum

Introduction/Need for Research

In Kentucky, only 2.6% of workers are currently engaged in STEM occupations, one of the lowest rates of STEM employment in the U.S. (Kentucky Center for Education & Workforce Statistics, n.d.). It is estimated between 2017 and 2027 STEM jobs in Kentucky will grow by 13% (Education Commission, 2018). Biotechnology is critical for the 21st century economy as it is at the forefront of innovations in medicine, agriculture, food production, and alternative fuel production. Dawson (2007) posited young people need to be highly literate in science to be prepared to research issues, think critically and question issues and claims in society today, especially in the field of biotechnology. Mansius and Hanegan (2008) found many science educators are not trained to use biotechnology equipment or have not had research experience when they graduate with their teaching certificates. Boone, Gartin, et al. (2006) and Wilson, et al. (2002) found agricultural science teachers in two states lacked knowledge in biotechnology. Only seven secondary schools in Kentucky (C. Davis, personal communication, December 4, 2017) out of 143 agricultural education programs (NAAE Kentucky, 2017) had students in the Agribiotechnology Career Pathway in the 2016-2017 school year. This pilot study was created to address the knowledge gaps in biotechnology education within the high school agricultural science curriculum by providing concrete resources to agricultural science teachers. Furthermore, the teachers' knowledge of and experience with biotechnology was documented, and the adoption and efficacy of the new curricula was quantified with a teacher follow-up survey.

Conceptual Framework

This paper leans on the integrated STEM education (Moore & Smith, 2014) paradigm and adds to research recommended by the *STEM Integration in K-12 education: Status, prospects, and an agenda for research* report by the National Academy of Engineering and National Research Council (NAE & NRC, 2014). Integrated STEM education is when one lesson, class or unit makes an effort to combine science, technology engineering and math, making connections between these subjects and problems in the real-world (Moore & Smith, 2014). The Introductory Biotechnology (IB) Unit was constructed with the idea of science, technology, engineering, and math all playing a role within the realm of agricultural careers and life. Integrating STEM into other subjects is identified as a way "that might improve student thinking, learning, engagement, motivation, or persistence," (NAE & NRC, 2014, p. 135, ¶1). Research reports the need to broaden student experiences and exposure to STEM fields and career pathways through multidisciplinary education (NAE & NRC, 2014). Teaching STEM subjects through secondary agricultural science in the form of biotechnology is one way to enhance student knowledge, understanding and experiences (Moore, 2008).

Methodology

Descriptive survey methods were utilized to achieve the objectives: 1) examine the efficacy and use of the new curriculum, the IB Unit, by agricultural science teachers', and 2) the teachers' knowledge of and experience with teaching biotechnology topics. Seven agricultural science teachers ($n = 7$) volunteered to pilot the IB Unit, in response to a statewide email sent to the state agricultural science teacher listserv. The survey was delivered to and completed online (Ladner, et al., 2002). The assessment tool contained selected questions from Mueller, et al.'s (2015) biotechnology education study in Indiana and Boone, et al.'s (2006) study assessing agricultural tea-

chers' knowledge and understanding of biotechnology in West Virginia. The instrument contained two sections: 1) questions about the use of the five lessons in the IB Unit, including its strengths and weaknesses, and 2) questions pertaining to demographics and experience teaching a selection of biotechnology topics.

Results/Findings

Seven teachers completed the survey after piloting the IB Unit. Teachers provided evaluative data on the usability of each of the five lessons in the IB Unit. Overall, across all five lessons, teachers (85%) reported they agreed (seven point scale with somewhat agree = 5; strongly agree = 7) the various activities within the IB Unit lessons helped students be more engaged in each lesson and 85% or more agreed (seven point scale with somewhat agree = 5; strongly agree = 7) the majority of their students met the lesson objectives. The major strengths across the five lessons were lesson activities, objectives, and content, as selected, and the overall weaknesses were the lessons were too long, followed by a couple of lessons perceived as difficult to use. Seventy-one percent (71%) of the teachers stated their students were interested in learning more about biotechnology by the end of the IB Unit. Teachers were asked what their overall impression was of the Unit. Written responses included: "It was a great unit with some really awesome activities. It was just too much to do in five 50 minute classes;" and "Students enjoy PowerPoints and having something to base some notes off of and that was not part of the lesson." Seventy-one percent (71%) stated they plan to implement the IB Unit in their class in the future. The teachers in the study were predominantly female (71%) teaching in rural public schools (57%) in the state of Kentucky (86%). A majority of the teachers had a master's degree (57%) and were in the age range of 25-29 years of age. Teachers reported a mean of 2.7 years (median = 1) of teaching experience, with a range (zero to 10 years) first year teachers to two teachers having more than five years of experience prior to the current school year. A majority (85%) of the teachers had not attended any biotechnology education workshops or trainings, and only one respondent reported having prior work experience in biotechnology prior to teaching that school year. Only 16% of the teachers reported having completed classes on or related to biotechnology prior to that school year. Fifty-seven percent (57%) stated they have not taught the topic of biotechnology ethics. Teachers were most knowledgeable about animal reproduction ($M = 3.14$, $SD = 1.21$), with 57% having taught it previously. Cumulatively, the teachers indicated being slightly knowledgeable to having no knowledge (no knowledge = 1 to expert knowledge = 5; overall mean across topics = 1.62) of the biotechnology topics in question.

Conclusions/Recommendations/Impact on Profession

The agricultural science teachers in this study were mostly inexperienced and lacked training in almost all of the areas of biotechnology posed, having no experience teaching most topics. They were favorable of the content and resources of the IB Unit and provided valuable feedback for the researchers to improve the IB Unit. The results provide feedback informing the researchers of edits to make to the IB Unit, including shortening and refining them and adding visual slides to the lessons. A recommendation of this study, although a small sample, is to provide agricultural science teachers with professional development training on biotechnology topics to empower teachers to integrate biotechnology into their classes. Agricultural science teachers educated more in the area of biotechnology may encourage more students to enter biotechnology/STEM collegiate majors and careers. Another recommendation for this type study of a small pilot would be to utilize a qualitative approach to gain further insight from the agricultural science teachers.

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Research Poster

Completers of a Summer Residential Program for Agriculture: Where are They Now?

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Completers of a Summer Residential Program for Agriculture: Where are They Now?

Introduction

Each year since 2001, approximately 100 rising secondary juniors and seniors, who are identified as gifted or talented, attend the Virginia Summer Residential Governor's School for Agriculture VGSA. The VGSA program allows these secondary students in Virginia to complete four weeks of coursework presented by faculty in the College of Agriculture and Life Sciences at Virginia Tech, and complete STEM-based research projects associated with agriculture. The mission of VGSA is "to develop future leaders and scientists for careers in agriculture" (Virginia Governor's School for Agriculture, 2017). Concentration of the curriculum is placed within the five NIFA priority science areas: global food security and hunger, climate change, sustainable energy, childhood obesity, and food safety (Toombs, N.D.). Interestingly, approximately 90% of students attending VGSA each year have little to no background in agriculture, nor have they participated in FFA or 4-H (Friedel, 2015). Given the background of these students traditionally enrolling in VGSA, one must ask if this program has an effect on secondary students consideration in choosing a career in agriculture. This research aligns with the American Association of Agricultural Education's recognized need to prepare future agricultural professionals equipped with essential skills; as identified in Research Priority 3: Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21st Century of the National Research Agenda (Stripling & Ricketts, 2016).

Theoretical Framework

The Theory of Planned Behavior (TPB; Ajzen, 1991) states that intention of behavior depends on motivation and ability. The theory differentiates between three different beliefs: behavioral, normative, and control (Ajzen, 1991). Behavioral beliefs connect the behavior to the outcomes and influence the attitudes toward the behavior. Normative beliefs refer to the expectations of people that are present in the individual's life. Control beliefs refer to the ability to perform the behavior. Behavior here is defined in a situation and intent as the indication of an individual's willingness to engage in behavior, such as seeking a career in agriculture (Ajzen, 1991).

Methodology

The purpose of this research was to determine the effect of VGSA on entering careers in agriculture. Specifically, researchers sought to: 1) identify careers associated with VGSA completers, 2) identify college degrees of VGSA completers, and 3) identify how VGSA informed the decision to enter a career in agriculture. Researchers obtained yearly rosters of participating students from the beginning of the VGSA program in 2001 through the year 2012 to better ensure students had completed college and were in the job market (N = 1,106). Social media was utilized to identify and confirm if individuals were past VGSA completers, and if they would like to complete a survey to provide more information regarding their career choices. A total of 547 completers were identified and sent an online questionnaire to ask additional questions regarding their career choices after completing VGSA. The online questionnaire was developed by the researchers to ask respondents demographic information, career information, and general attitude towards the VGSA program. Of the 547 students identified, 101 former VGSA students completed the questionnaire. Because of the low participation rate to the online questionnaire, the researchers reviewed social media profiles of the 547 completers to determine for declaration of an agriculture career, or a career outside of agriculture.

Results

Of the 547 VGSA completers recognized, 330 (60%) identified as female, and 217 (40%) identified as male. After reviewing social media profiles of these 547 completers, 69 (12.6%) were identified as having an agriculture career. These agriculture careers were in the areas of: agricultural research (*n* = 23), environmental or conservation (*n* = 15), agricultural education (*n* = 12), animal science (*n* = 11), and agribusiness (*n* = 8). There were 104 (19.0%) VGSA completers identified who, according to social media profiles, were not in agriculture careers. These areas included medical (*n* = 35), engineering (*n* = 31), government (*n* = 13), higher education (*n* = 13), and director of an organization (*n* = 12). Note that 68.4% of the VGSA completers could not be identified with certainty or did not have indication of their career field on their social media profile. From the questionnaire answered by 101 VGSA completers, 75 identified as female and 25 identified as male. With respect to ethnic or racial representation, 81 completers identified as White/Caucasian, and 12 identified as Asian. Other demographics of the remaining nine participants included Hispanic or Latino, Black or African American, or Native American. Of these participants, 47 live and work in Virginia. Of the questionnaire completers, 59 had obtained a bachelor's degree, 24 had obtained a master's degree, and 14 had obtained a doctoral degree. VGSA completers enrolled in over 29 majors of study, of which the most popular were six were identified in the college of agriculture. The most popular majors included biology (*n* = 13), animal sciences (*n* = 10), environmental sciences (*n* = 8), biochemistry (n = 7), business (*n* = 6), and engineering (*n* = 5). Only 15 participants considered themselves as currently working in an agricultural career. This number corresponded approximately with the job titles presented by the completers. Of these 15 individuals, five had little experience in agriculture before attending VGSA. For students who were asked if VGSA influenced their career decision, but indicated they were not in an agriculture career, 23 indicated that they had no intention of being in an ag career, 18 indicated that they have a stronger appreciation for agriculture, 9 indicated that there were skills learned during their time in VGSA that contributed to their current career, 8 indicated they did spend some time in an agriculture career, and 6 indicated they were curious and researched more about an agriculture career. For students who were asked if VGSA influenced their career decision and were in an agriculture career, 8 indicated that participating in VGSA confirmed their decision, 5 indicated that they explored additional agriculture career options, and 5 indicated that they began a career in agriculture as a result from participating in VGSA. When asked if VGSA influenced their attitude towards agriculture, 77 respondents were enthusiastically appreciative of VGSA contributing to their increased awareness of agriculture, while seven indicated that they were not made more aware of agricultural careers or content.

Conclusions and Implication

These findings present the only known evidence of long-term impact of the VGSA program. While the findings are limited due to the low participation rate of the questionnaire, and difficulty in identifying past VGSA completers, there is some evidence that the program does promote a positive appreciation for the agriculture industry for these individuals who have little to no agricultural background. Faculty members and staff associated with the VGSA program are encouraged to develop additional coursework and resources in the program to more effectively promote agriculture careers as a viable option for future VGSA students. The developed resources and coursework should focus on the behavioral, normative, and control beliefs associated with career intentions (Ajzen, 1991).

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Research Poster

Cultural Competence: How skilled are students across majors?

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Cultural Competence: How skilled are students across majors?

Introduction

Cultural competence has been identified by institutions of higher learning (IHLs) as a primary competency for students entering an increasingly diverse and advanced global job market (Peifer, Chambers, & Lee, 2017; Stough-Hunter, Guinan, & Hart, 2016). Integral to developing this competence is self-awareness and an examination of how one's personal beliefs and assumptions influence intercultural interactions (Cross, 2012; Hosokawa, 2012; Roysircar, 2004). With an ever-increasing diverse student body (Prieto, 2018), post-secondary educators must actively seek out ways to increase cultural competence in the college classroom. Increasing cultural competence among students entering a global workforce also supports the American Association of Agricultural Educators (AAAE) current National Research Agenda (Roberts, Harder, & Brashears, 2016) to address the challenges of workforce preparedness in the 21st century.

Theoretical Framework

Cross's Cultural Competence Continuum (CCC) (Cross, Bazron, Dennis, & Isaacs, 1989) provides a framework for understanding individual levels of cultural competence using a continuum of six levels ranging from cultural destructiveness to cultural proficiency. At the far most negative end of the continuum is cultural destructiveness, which is indicated by attitudes (individual and organizational) and practices (actions and policies) that are deleterious to cultures and individuals. The next point on the continuum is cultural incapacity, when individuals see difference and make it wrong. The midway point on the continuum is cultural blindness. Those at this level adhere to a liberal unbiased philosophy of "we are all the same" (Cross, 2012, p. 84). Next on the continuum is cultural pre-competence, when individuals respect those from other cultures and use unbiased hiring methods. Pre-Competence is followed by cultural competence, when individuals respect other cultures and understand the benefit of cultural differences. Finally, individuals can advance to cultural proficiency, when they value cultural differences and research ways to increase their cultural competence.

Methodology

The purpose of this study was to describe the self-perceived cultural competence of students enrolled in a teaching methods course. The guiding objectives of this study were to describe student location on Cross's CCC as evidenced through their self-ratings and written responses related to application of cultural competence to their respective fields, and to compare self-perceived cultural competence between the School of Human Sciences majors enrolled in the course (AELC/AgSci, FDM, and HDFS). To accomplish these objectives a mixed methods design was used. A convenience sample of seventy-one undergraduate students enrolled in a teaching methods of agriculture and human sciences course at Mississippi State University were invited to participate in the study. Written consent was obtained and sixty (60) students served as the study sample. Participants completed a researcher-developed Cultural Competency Self-Assessment, which measured individual self-perceived levels of cultural competence and how cultural competence can be used in the participants' respective degree fields. Qualitative data collected from responses to open-ended questions were triangulated and coded for recurring themes and used to align each participant's self-rating on Cross's CCC levels. Measures of central tendency were computed using the Statistical Package for the Social Sciences (SPSS v.

24) for the self-perceived level of cultural competency variable. This quantitative statement asked participants to assign their current level of cultural competence a rating from 1 to 10. The researchers corresponded this ten-point scale to Cross's CCC accordingly, deconstructiveness (1-2), incapacity (3-4), Blindness (4-5), pre-competence (5-7), competence (7-8), and proficiency (9-10).

Findings

The sample participants for this research majored in three different areas: AELC/AgSci (n = 19), Fashion Design and Merchandising (FDM) (n = 18), and Human Development and Family Sciences (HDFS) (n = 23). Twenty-four participants' responses were not themed with Cross's CCC. Instead they were themed generally as having knowledge that cultural competency entails *working with diverse audiences*. An example statement from this theme was "I want to be an occupational therapist, so I will work with people from all different walks of life." The breakdown of participants by major in this theme were AELC/AgSci (n = 7), FDM (n = 8), and HDFS (n = 9). Under this theme participants self-reported themselves between five and nine on the provided ten-point scale (M = 7.17, SD = 1.40). The first level of Cross's CCC that participants were themed under was *blindness* (n = 3); one response was "I can use cultural competence with children to show we are the same but just a different race." All three respondents in this theme were HDFS students who rated themselves as either seven (n = 1) or nine (n = 2) on the provided scale. The majority of student responses (n = 26) were themed as *pre-competence*, because they expressed that cultural competence included meeting the needs of all cultures. All majors were represented in this theme: AELC/AgSci (n = 11), FDM (n = 8), and HDFS (n = 7). Their response on the scale ranged from two to nine (M = 6.84, SD = 1.78). Finally, seven responses were themed as *cultural competence* (AELC/AgSci = 1, FDM = 2, HDFS = 4). An example response for this theme was "when teaching kids and guiding FFA kids, I am going to cross many different types of people. I can use cultural competency to mold lessons to each person and make everyone feel welcome." On the self-reported scale respondents in this theme ranged from two to eight (M = 5.86, SD = 2.41).

Conclusions/Implications/Recommendations

The findings indicate the participants of this study need further training on how the skill of cultural competence can be utilized in their respective career fields. Results also indicated a slight misalignment between participants' self-reported level of cultural competence and where their statements fell along Cross's CCC. With more non-AELC/AgSci degrees being themed as *cultural competence*, a closer look at how cultural competence education is embedded in the School of Human Sciences' program coursework would be beneficial for intervention development and implementation and future research. With cultural competency indicated as a priority for workforce entry by IHLs (Peifer, Chambers, & Lee, 2017), providing cultural competence educational opportunities to students should be given precedence by colleges and universities (Talbert & Edwin, 2008). Furthermore, researchers in our profession support and recommend multicultural education for agricultural majors and for their respective educators (Vincent, Killingsworth, & Torres, 2012). Finally, in lieu of an institutionally-adopted multicultural education course, these researchers recommend that considerable attention should be given by educators to embed cultural competency into their course curriculum; thereby, contributing to the AAAE National Research Agenda (Roberts, Harder, & Brashears, 2016, 2016) and empowering students to be workforce ready in the 21st century.

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Cultural Engagement Among Agriculture, Food and Life Science Honors Students

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Cultural Engagement Among Agriculture, Food and Life Science Honors Students

Introduction

Previous generations competed locally, regionally and on a national basis for jobs, while today's students must complete on a global basis for jobs (Hammer, 2012). Students equipped with an intercultural mindset are in demand by employers (Jackson, 2015). Educational institutions offer international, diversity, and inclusion experiences and classes to increase students understanding of cultures (Fabregas Janeiro, Fabre, Nuño de, 2014). AAAE National Research Agenda priority three, specifies that graduates entering the agriculture sector will need to understand economic, societal and environmental aspects because of the global reach of the sector (Roberts, Harder & Brashears, 2016).

Intercultural competence, the ability to bridge diversity and inclusion based on understanding and adapting behaviors based on recognizing commonalities and differences, is attributed to individuals having effective professional outcomes (Hammer, 2012). Intercultural competence is developed through comprehensive and concentrated reflection on cultures (Fabregas Janeiro, Fabre, Nuño de, 2014; Hammer, 2012). Hammer (2012) identified ten key intercultural learning opportunities which can be used to develop intercultural competence which include: training programs, workplace activities, theatre, film and arts, educational classes, personal interactions and intercultural journaling. This study identified self-reported cultural engagement of agriculture, food and life science honors program students and honors and graduate mentors assisting with a semester long honors program orientation course.

Conceptual/ Theoretical Framework

Adler and Bartholmew (1992) looked at cross-cultural awareness and reported five cross-cultural competencies needed by leaders. The five competencies included knowing about cultural environments worldwide, recognizing trends and technologies, working with diverse cultures, adapting to living and communicating in other cultures, and relating with equality to other cultures. According to Intercultural Development Inventory Resources Guide, "intercultural mindsets have greater capacity to effectively shift perspective and behavior based on commonalities and difference" (Hammer, 2012, p. 31).

Methodology

A census was conducted with an honors freshmen orientation course and included undergraduate students (n-53), honors peer mentors (n = 7), and a graduate teaching assistant (n = 1). The researchers developed a questionnaire based on the topics measured by the Intercultural Development Inventory (IDI). A panel of experts with past experience with diversity, inclusion, and global awareness reviewed the instrument for face and content validity. The instrument was administered during a class session as a pre-assessment to the IDI and an 82.5% (n = 52) response rate was achieved. Data was coded and entered into an Excel spreadsheet. Descriptive statistics were calculated to determine frequency.

Results/ Findings

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Response	Yes	No

Have you completed any online or in-person training programs focused on cultural difference?	6	46
Have you participated in RSOs or committees that focus on diversity or inclusion?	11	41
Have you attended cross-cultural movies, pays, artistic exhibits or performances?	46	6
Have you attended college or university classes that focus on cross-cultural communication, relations or ethnic and gender studies?	14	38
Have you participated in intentional work-related, personal, social or community interactions with people from different cultures?	39	13
Have you intentionally reflected on cultural differences and commonalities you observe in your daily interactions with people from other cultural groups?	40	12
Have you read books that describe and/or explain patterns of cultural difference and similarity?	35	17
Have you traveled, served, or studied where you observed and engaged with a different culture?	38	14
Have you ever received one-on-one cultural coaching to help you gain knowledge of another culture?	7	45
Have you ever visited museums or centers and/or made cultural or ethnic site visits to increase your knowledge about diverse cultural experiences?	45	7

Respondents perceived they had attended cross cultural movies, plays and artistic performances, with 88.4% (n = 46) indicating engagement. Next, 86.5% (n = 45) of students reported visiting museums or cultural or ethnic site visits. Additionally, 76.9% (n = 40) responded they reflected on cultural differences and commonalities based on their daily interactions with people from other cultural groups. Moreover, 75% (n = 39) of respondents had intentionally participated in work related, personal, social or community interactions with people from different cultures. A total of 73.1% (n = 38) participants indicated they had traveled, served, or studied in environments where they observed or engaged with a different culture. A majority of respondents indicated they had engaged with books that described or explained patterns of cultural differences or similarities, with 67.3% (n = 35) indicating "yes."

Regarding in-person or online training, 88.4% of respondents (n = 46) indicated they had not participated in any training. Next, 86.5% (n = 45) of participants responded that they had not participated in one-on-one cultural coaching. Respondents indicated that they had not participated in RSOs or committees that focus on diversity, 78.8% (n = 41). Finally, 73.1% (n = 38) of respondents indicated that they had not enrolled in any classes related to diversity and inclusion.

Recommendations and Conclusions

The results of this study demonstrates participants have had experiences where they have observed or interacted with individuals of different cultures. However, participants have not participated in prolonged experiences, education or training which required them to reflect on cultural differences. Therefore, the researchers recommend: 1) administer IDI to determine a baseline on continuum, 2) expand study to include non-honors students enrolled in a college of agriculture, food, and life sciences, and 3) identify and categorize existing opportunities that would promote intercultural awareness and development.

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Research Poster

Culturally Responsive Teaching: Experiences of underrepresented students

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Culturally Responsive Teaching: Experiences of underrepresented students

Introduction

Culturally responsive teaching surfaced around the early 1990's and has been more recently studied in the last decade. Hammond (2015), defines culturally responsive teaching as "the process of using familiar cultural information and processes to scaffold learning. Emphasizes communal orientation, focuses on relationships, cognitive scaffolding, and critical social awareness" (p. 15). It is the teacher's responsibility to recognize the cultural differences in a classroom and to respond positively in order to connect with their students (Hammond, 2015). It is important to first understand the student's perspective to identify what the needs are amongst the underrepresented groups in the classroom. This research meets research priority areas of new technologies, practices, and products adoption decision, and sufficient scientific and professional workforce that addresses the challenges of the 21st century (Roberts, Harder, & Brashears, 2016). The purpose of this study was to identify and describe the experiences of minority postsecondary students related to culturally responsive teaching, and examine the aspects that make students feel included and excluded when culturally responsive teaching is present and when it is not.

Theoretical Framework

The framework for this research is Culturally Responsive Teaching (CRT). Wlodkowski and Ginsberg (1995), explain that CRT engages learners while still respecting cultural integrity. This theory includes four motivational conditions that explain the success of an inclusive learning environment between students and teachers; establishing inclusion, developing attitudes, enhancing meaning, and engendering competence (Wlodkowski & Ginsberg, 1995). These four motivational conditions exemplify the basic interaction and connections that people have with one another (Wlodkowski & Ginsberg, 1995). If teachers are intentional with the interactions that the implement in the classroom, the four motivational conditions would contribute to student engagement in the classroom (Wlodkowski & Ginsberg, 1995).

Methodology

Focus group methodology was used to collect the qualitative data from postsecondary underrepresented minority students at Mississippi State University. The focus group collection method was chosen due to the ability to gain common experiences from underrepresented groups on campus as it pertains to culturally responsive teaching in the classroom. The focus groups also allow the researcher to collect views, perceptions, and the meaning behind each experience (Gill, Stewart, Treasure & Chadwick, 2008). There were 3 focus groups conducted with 12 participants from various majors across campus. Participants were recruited by email through the Holmes Cultural Diversity Center and through the snowball effect. The focus groups were semi-structured and held in at the campus diversity center to help provide familiarity to the participants. Two of the researchers and one individual from the office of diversity and inclusion proctored each focus group. A facilitation guide was used for each focus group to help maintain consistency, however there was room for the moderator to ask more questions to dive deeper into the topic when needed. Transcriptions, audio files, and field notes were all utilized to analyze the focus group results. To help minimize any bias all three researchers on this project individually themed each focus group and consulted one another to form a consensus of theme areas. The overarching research question is: What are the experiences of underrepresented students around Culturally Responsive Teaching on Mississippi State University's campus?

Results

A total of three focus groups were held during Spring 2018 and twelve individuals in total agreed to participate. Some demographics of the participants includes, majority female (n=8), majority African-American (n=10) other participants were Asian and Hispanic, and only two individuals indicated English is not their first language. Based on the questions asked participant responses were themed under three general areas including, *feelings of inclusion or exclusion on campus*, *classroom experiences*, and lastly *indicators of culturally responsive teaching*. In general, across campus underrepresented *students feel included* by others' willingness to help and being with like people who hold similar values. Related to feeling included FG1S1 stated, "when I'm around people who even though we may not know each other, we share those same values." Actions that have made *participants feel excluded* involve offensive or insensitive communication, lack of commonalities, feeling inferior, and feeling invisible during group interactions. Related to feeling invisible FG2S4 stated, "sometimes you will speak to people and they will turn their head and won't speak back." While analyzing classroom experiences statements emerged as either inclusive or exclusive behaviors. Participants *felt included* when they were enrolled in major/smaller classes, through engaging or enthusiastic teaching, when teachers build rapport and collaboration in the course, and lastly participants also mentioned feelings of inclusion with minority instructors. Overall *feelings of exclusion in the classroom* were similar to exclusion on campus but also included feeling singled out or being asked to speak for a group they identify with, lack of engagement from the majority population, and lack of relatable examples provided by the instructor. Lastly, participants provided *insights on what culturally responsive teaching (CRT) looks like to them and what they notice when CRT techniques are used*. Participants associate the following attributes to CRT, diversity in the classroom population of both the teacher and students, when teachers try to know their learners and use appropriate examples for learning, and when effective communication is established (i.e. regular office hours, conversations before/after class). Related to knowing your learners FG2S4 stated, "he doesn't just teach from his perspective he teaches from everybody else's perspective." When CRT is not present they notice more hesitation on part of the teacher and students enrolled in the course (i.e. lack of peer-to-peer interaction, insensitivity, feeling inferior), they feel a different energy in the classroom and notice non-verbal communication relating back to hesitation, and at times feel unwelcome or secluded. Related to non-verbal communication FG3S1 stated, "when somebody's face seems more relaxed versus when they are more closed up, their bodies are tenser. I think it is the little things more than overt actions."

Conclusions/Discussion/Recommendations

Overall these results can benefit all educators as we continue to see more diverse classroom audiences. By incorporating simple gestures like using varying examples from multiple perspectives and cultures or building rapport with all our learners we can make strides to a more inclusive environment. When culturally responsive teaching is not utilized by educators, our learners tend to disengage and keep to themselves which does not build an effective learning experience. To follow-up these focus groups the researchers intend to conduct classroom observations of instructors, identified by the participants, who display positively CRT. These observations will help to further explore and describe culturally responsive teaching to help provide vivid examples to not only be used in our own teaching but also in the preparation of our pre-service teachers.

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Development and Evaluation of a Variable-Frequency Drive Trainer for use in a University Agricultural Electricity Course

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Introduction

Through the years, as American agriculture has developed, it has become gradually dependent on mechanization (Hunt, 2001). National professional standards (American Association for Agricultural Education, 2017) call for curriculum which "demonstrates awareness of cutting edge technology in agriculture" (p. 2) and "teach[es] students how to use technology appropriate to the agricultural industry" (p. 2). Considering this challenge, educators are tasked to ensure that their curriculum is relevant to the ever-changing environment present in agricultural mechanics (Shultz, Anderson, Shultz, & Paulsen, 2014). However, many school-based agricultural education programs lack the tools, equipment, and finances to effectively teach the current curriculum (McCubbins, Wells, Anderson, & Paulsen, 2017), much less more advanced applications.

Educational trainers are used to expose students "to relatively complex scenarios in a safe learning environment" (Wright et al., 2018). In this study, we sought to develop and evaluate a low-cost variable frequency drive trainer and laboratory activity for use in an undergraduate agricultural electricity course. Commercially-available VFD trainers such as the LearningLab (Dugger, IN) VFD trainer range in cost from $2,595 to $2,861, depending on the vendor, making it difficult for agricultural systems management programs to provide class quality trainers for student laboratory use. Due to this high cost of VFD trainers, we determined a need to develop and evaluate a low-cost (under $600) VFD trainer and activity that would allow programs on limited budgets to provide several units for student use.

Methodology

We developed the VFD trainer by using a Lenze (Uxbridge, MA) SMVector ESV371-1S model VFD and a Leeson (Grafton, WI) model C4T34FB5B 208-230 VAC three-phase motor. A complete list of materials and description of the VFD trainer can be found in Teekell, Hilaire, and Johnson, (2017). The laboratory activity required students to make basic calculations to find and set minimum and maximum frequencies of motor speed. Students' then were required to program the VFD to set a 5-second motor acceleration and deceleration times. Next, students calculated and programmed the current output percentage so the VFD would provide the motor with overload protection. Lastly, students operated the motor, recorded the VFD output frequency, measured motor RPM with a digital tachometer, calculated and set the display frequency multiplier so the VFD displayed indicated motor RPM.

All students (N= 23) enrolled in AGME 3173 during spring 2018 received classroom instruction in basic VFD operating principles. Immediately following completion of the activity, students (n= 21) completed a voluntary seven item Likert-type survey (1 = strongly disagree and 4 = strongly agree) designed to assess their previous experience with VFD (two items) and their perceptions of the effectiveness of the VFD trainer and associated laboratory activity as a learning experience (five items). A panel of three experts in educational research and technical education examined the survey and deemed it to possess face and content validity. *Post hoc* analyses determined coefficient alpha reliabilities of .85 and .87 for the summated scales measuring students' prior experiences and perceptions of educational effectiveness, respectively.

Results

Students enrolled in AGME 3173 reported little exposure to VFDs prior to the classroom study and completion of the trainer-based laboratory activity. The mean score of the two item scale measured familiarity was 1.67 (*SD* = 0.97) with median and modal score both being 1.0. This indicated that students disagreed that they had prior experiences with VFDs prior to the laboratory activity. Upon completion of the laboratory activity, students agreed that the VFD trainer and activity were effective in helping them learn and understand VFDs. The mean score on the five item scale measuring effectiveness was 3.51 (*SD* = 0.58) with a median score of 3.60 and a modal score of 4.0. This indicated students were in agreement that the trainer and laboratory activity were effective in helping them learn and understand the operation and programming of VFDs. Table 1 summarizes responses from students for previous exposure to VFDs and perceptions of the learning ability by scale and item.

Table 1.
Student (*n =21)* perceptions of previous exposure to VFDs and effectiveness of trainer-based laboratory activity

Summated Scale Individual Item	*M*	*SD*	*Mdn*
Previous Experience	**1.67**	**0.97**	**1.0**
I was familiar with VFDs prior to this class.	1.76	1.04	1.0
I had hands-on experience with VFDs prior to this lab activity.	1.57	1.03	1.0
Educational Effectiveness	**3.51**	**0.58**	**3.6**
The hands-on experience with the VFD trainer increased my understanding of this technology.	3.52	0.81	4.0
I know more about VFDs as a result of this laboratory activity.	3.62	0.50	4.0
Using the VFD trainer helped me learn about this technology.	3.62	0.59	4.0
I feel confident that I have a basic understanding of VFD theory.	3.33	0.87	4.0
I feel confident I understand how to operate a VFD.	3.48	0.75	4.0

Note. Based on a scale where 1 = strongly disagree and 4 = strongly agree

Summary and Conclusions

We constructed a safe, functional VFD trainer for a unit cost of $534.70. This trainer when constructed with the materials listed above came in at a cost of approximately 20% of the retail cost of a commercially available VFD trainer. Survey results indicated that students possessed little prior knowledge or experience of VFD indicating a need for a hands-on experience and operation due to the growing importance of VFDs in agriculture. The results also indicated that this laboratory exercise was an effective learning experience for students in AGME 3173. Finally, we concluded that the VFD trainer and lab activity were economical and educationally effective additions to our undergraduate agricultural electricity course. We intend to construct three additional trainers for use in future semesters. The addition of more VFD trainers will allow us to expand the scope of our lab and still allow the students to finish the activity in a two hour lab period.

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Do Teachers Need Support to Teach Students with Specific Learning Disabilities?

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Introduction

As the number of students being identified with specific learning disabilities (SLD) continues to grow it is important to find new and innovative methods for differentiated instruction. Increased SLD enrollment in school-based agricultural education (SBAE) programs challenges agricultural educators to teach a diverse group of students (Ross, 2006). Pense (2009) found that SBAE programs in Illinois had at least 23% of students in the classrooms identified with SLD. SLD students are supported by the curricular structure of the SBAE programs' focus towards hands on activities and real-world application (Kessel, Wingenbach, & Lawver, 2009). If SLD students' needs are not accommodated the agricultural industry faces a risk of losing up to 25% of the workforce (Pirtle, 2012) because students may become disengaged and explore other career options. Hoerst and Whittington (2009) stated that many secondary agricultural education teachers need to be aware of more teaching techniques for inclusion to use within the classroom. Kessell, et al. (2009) found that many teachers took a special education course either required by their program or as an elective, but special education courses alone did not always prepare teachers for working with SLD students and teachers were not always provided additional support within the classroom to properly engage and educate SLD students (Hoerst & Whittington, 2009). Agricultural education teachers need continuous support and professional development (PD) to assure they meet the needs of the diverse learners in their classrooms.

Theoretical Framework

The theoretical framework for this research was based on the concept of efficacy. Bandura and Adams' (1977) early research analyzed self-efficacy as a conviction that a desired goal can be accomplished through preforming certain behaviors (Stair et al., 2010). If teachers feel confident that the strategies they use within the classroom help students to perform better academically then these strategies will continue to be used. Teachers need to continue to improve their own competency with new strategies they gain through PD opportunities. We sought to determine teacher needs related to their experience with SLD students in order to assist with identifying PD to support an increase in their self-efficacy.

Methodology

The purpose of this study was to determine perceived use and effectiveness of teaching strategies utilized by teachers in SBAE programs based on recommended practices and to determine teacher's desire/need for PD. Objectives guiding this study were to 1) describe teacher's perceived use and effectiveness of recommended differentiated instructional strategies and 2) determine teacher's desire/need for PD opportunities related to working with SLD students. The population for this study was a national sample of agricultural educators who taught an entry level SBAE course. Both middle and high school instructors were included. The criteria also included enrollment of SLD students in the course. A list of state staff was obtained and each state staff director was contacted through email and asked to recommend teachers that met the criteria for the research. Once the contact information for the population frame (N = 216) was received and entered into a spreadsheet, teachers were emailed a message making them aware that their state staff director recommended them for the study. Data collection occurred during November and December of 2017 and followed Dillman's tailored design method (Dillman, Smyth, & Christian, 2009). The instrument was created and administered using Qualtrics. The first section was modified from previous research (Stair, et al., 2010) to identify commonly used strategies when working with SLD students. Internal consistency was analyzed for reliability using Cronbach's alpha. Analysis indicated $\alpha = .632$ for perceived use and $\alpha = .835$ for

effectiveness. A Likert-type scale was used to determine the teacher's need or desire for more PD opportunities to teach SLD students. Cronbach's alpha of .7 was obtained for PD. A response rate of 69% (n = 146) was achieved. Objective two determined teachers' desire or need for more PD opportunities related to working with SLD students. Teachers were asked to respond to eleven statements by stating if they strongly agreed, agree, disagreed, or strongly disagreed. Some statements were reverse coded.

Findings

The majority (54.03%) of the respondents were female. Age ranged from 23 to 59 with a mean age of 38. Years of teaching experience ranged from first year teacher to more than 30 years of experience with the majority (30.9%) between one to five years of experience. The percentage of students with an Individual Education Plan (IEP) or 504 Plan in entry level agricultural education classes had a mean of 20.98 and standard deviation of 16.72. To determine how often strategies were being used by entry level agricultural educator's data was collected, averaged and ranked. Teachers described "read a students' IEP and provide those modifications (M = 4.54), meaningful learning (engaging tasks and graphics, elaboration, etc.) (M = 4.14), and test modifications (extended time, separate testing location, no penalization for spelling errors, word banks, oral exams/presentations)" (M = 4.04) as the most used strategies. The least used strategies identified by teachers were utilization of computer-based instruction (M = 3.14) and support outside of class (tutoring) (M = 3.06). Respondents were asked to rank eight strategies on a scale of one to five with one being very ineffective and five being very effective. Teachers identified "meaningful instruction (engaging tasks and graphics, elaboration, etc.)" as the most effective strategy (M = 1.75). The least effective strategy reported was utilization of computer-based instruction (M = 2.47). Teachers indicated if they were provided the opportunity to attend PD they would, but work schedule was identified as a barrier to participate in PD.

Conclusions

It is encouraging to conclude agricultural education teachers use a variety of strategies when working with SLD students. Typically strategies used are those in which teachers feel they are more effective aligning with self-efficacy theory (Bandura & Adams, 1977). Strategies are being utilized by teachers and are beneficial for all students, not just SLD students. The majority of teachers who responded were in their first five years of teaching and have completed at least one special education course that was required by their certification program. Providing teachers with opportunities to attend PD is important. Financial need or lack of resources may be the reason that strategies such as computer-based instruction are not being utilized within the classrooms.

Recommendations

Further explanation of the depth of differentiated instructional strategies used by teachers would be beneficial. Qualitative data collection using focus groups to determine specific strategies used and determined to be effective beyond those in this study is recommended. Focus groups should also include questions to determine barriers for why teachers are unable to attend PD. Support is needed. We recommended that state staff and/or school districts consider ways to provide support for agricultural education teachers to attend PD related to inclusion and differentiated instruction. Collaboration among the special education department and the SBAE program would prove to help better support teachers and SLD students; cooperation is highly recommended.

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Echoes in the Void: Agriculturalists Perceptions of Communicating with Non-Agricultural Populations

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Introduction

The challenges of developing disciplinary literacy between agriculturalists and non-agriculturalists has been elusive and is compounded by the complexity of agriculture in a decreasingly agriculturally literate society (Balschweid, Thompson, & Cole, 1998). Clemons, et al. (2018) documented the importance of parsing the difference of being literate and possessing literacy in agriculture. Disciplinary literacy refers to the knowledge and understanding needed for advanced study while being disciplinary literate is the ability to communicate through speaking, listening, and writing using specialized words and terms (Clemons, et al., 2018). Literacy focuses on knowledge and understanding while being literate is concerned with communication and learning through reading, writing and speaking (Harris & Hodges, 1995). Public perception of agriculture is often dictated by news organizations, personal experiences, and social media. Marketing and information are powerful measures for the promotion of food products when little regard is given for the limitations of agricultural literacy of the general public. Competing themes within agricultural literacy influence decisions the general public make when selecting goods and services originating from agricultural production. Many factors have historically influenced consumer choice when determining family food needs: store environment, pricing, assortment, and store image (Aylott & Mitchell, 1998). In comparison, today's consumer is weighing ease of access and technology in favor of clear and concise messages (Elms, DeKervenoael, & Hallsworth, 2016). It is then left to society to embrace the differences between agriculturalists and non-agriculturalists using analysis and reflection to make things better (Chambers, 1997).

Theoretical Framework

The theoretical basis for this study is based on Herzog's theory of Uses and Gratification (1940) and structured in the work of Shanahan and Shanahan (2008). Balschweid, et al. (1998) identified the importance of considering the nation's agricultural knowledge as means of being agriculturally literate. To address the perceptions for developing common disciplinary literacy between agriculturalists and non-agriculturalists three research questions guided this investigation: 1) How can agriculture literacy be promoted among non-agriculturalists? 2) What challenges are there to promoting agricultural literacy with non-agriculturalists? and 3) What personal characteristics influence agricultural literacy? This research addresses Priority One: Public and Policy Maker Understanding of Agriculture and Natural Resources (Enns, Martin, & Spielmaker). Enns, et al. (2016) postulated the need for agriculturalists to continue the search for methods which will best educate the general public and policy makers about agriculture.

Methods

A Delphi study approach was used to frame Herzog's theory of Uses and Gratification (1940) and was structured in the work of Shanahan and Shanahan (2008). The study consisted of three-rounds of investigation with identified experts ($N = 15$) using predetermined selection criteria. The instrument was developed using statements constructed from existing research in the field of agriscience education, disciplinary literature, and literacy research outside of agriscience education. Dalkey and Helmer (1963) of the RAND Corporation are generally

credited with the development of the Delphi technique. Hsu and Sandford (2007) noted it "is a widely used and accepted method for achieving convergence of opinion concerning real-world knowledge solicited from experts within certain topic areas" (p. 1). Experts were purposively chosen ($N = 15$) to participate in the study using established Delphi techniques as reported by Rayfield and Croom (2010) and supported by Conner and Roberts (2013). Panel members were recruited and selected based on their leadership roles and experience in agriculture. Participants were employed in the agriculture industry and served in a leadership capacity that provided opportunity for interacting with the public. The Delphi process consisted of three rounds and data was collected using open-ended and closed-ended response questions and statements. The first-round instrument consisted of three open-ended questions: 1) How can agriculture literacy be promoted among non-agriculturalists? 2) What challenges are there to promoting agricultural literacy with non-agriculturalists? and 3) What personal characteristics influence agricultural literacy?

Results

The first-round instrument was comprised of three open-ended questions and generated 65 responses generated into 19 statements in the round-two instrument. Round two statements were presented using a five-point scale: 1) Strongly Agree, 2) Agree, 3) Neither Agree or Disagree, 4) Disagree, 5) Strongly Disagree. Agreement levels of 80% (Dalkey, 1969) were used to determine consensus for each question in rounds two and three. This level of agreement is consistent with Rayfield and Croom (2010) where items receiving 80% agree or strongly agree determines consensus. Participants indicated their perceptions of how disciplinary literacy can be promoted among non-agriculturalists, the challenges experienced when discussing agriculture, and the personal characteristics which influence disciplinary literacy. The interpretation of the participant responses identified potential areas of dissonance when discussing disciplinary literacy outside of agriculture.

Conclusions and Implications

This study describes the need for further understanding of disciplinary literacy and the perceptions non-agriculturalists possess of the agricultural industry. Participants demonstrated a positive self-worth when discussing agriculture as related to disciplinary literacy. Their intrinsic understanding of the role of agriculture in society to enhance the life, food security, and need for transparency was overwhelmingly evident. Participants failed to identify the methods they use for translating this knowledge to non-agriculturalists. This finding reinforces the suspected gap in our field; disciplinary literacy is highly ingrained in our conversations with each other, however bridging the literacy gap to non-agriculturalists is elusive. Agriculturalists in this study felt strongly that disciplinary literacy best explains agriculture and through education non-agriculturalists will adapt. If both agriculturalists and non-agriculturalists fail to cooperatively develop a common vernacular, ambiguity, diversity, and plural realities become difficult to tolerate (Chambers, 1997). The greater implication of this study is "who's right" and how will agriculture rise to meet the challenges of a growing population that demonstrates less disciplinary literacy in agriculture?

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Educational Feedback Formats:
Student Perceptions in an Undergraduate Honors Research Course

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Educational Feedback Formats: Student Perceptions in an Undergraduate Honors Research Course

Introduction

Educational feedback is multifaceted in university-level classes and strategies that can positively influence student performance need to be better understood (Hosek, Houser, & Richmond, 2017; West & Turner, 2016). Previous research indicates that assessment is essential to student performance and interest (McCarthy, 2015), and that timely feedback of sound quality is needed for success (Crook et al., 2012). Additionally, constructive feedback may create stronger relationships between students and instructors (Crook et al., 2012). Video-based feedback has been present for over two decades as a mode of assessment for universities, yet research investigating the value of video-based assessment feedback is lacking (Henderson & Phillips, 2015).

Theoretical Framework

Immediacy theory has been used to illustrate that the more immediate the response from the instructor, and the clearer the feedback, the more effective the learning is for the student (Hosek et al., 2017; Bolkan, Goodboy, & Myers, 2017). Nonverbal immediacy has also been shown to convey deeper meaning through the use of facial expression in video and nonverbal sounds via audio in an online teaching environment (Dixson, Greenwell, Rogers-Stacy, Weister, & Lauer, 2017). Within this particular study, immediacy was manipulated by randomly assigning students to receive either written feedback or video recorded feedback on their assignments.

Purpose & Objectives

The purpose of this study was to describe student preferences with regard to format of instructor feedback. In order to meet this purpose, the following objectives guided the study: 1) determine perceptions of teacher immediacy among students who receive written feedback and those who receive video recorded feedback; and 2) determine the differences in perceptions of teacher immediacy between students in these two feedback groups. This study addressed Priority Area 4 of the American Association of Agricultural Education's National Research Agenda, focusing on meaningful, engaged learning in all environments (Roberts, Harder, & Brashears, 2016).

Methodology

This study was conducted with a census sample of classroom students enrolled at [University] in Honors Proposal Development in the spring of 2018 for a group of 29 students (five males and 22 females) which met three times a week for an hour. At the beginning of the semester, students were randomly assigned to either a "written" or to a "video" feedback group. Over the course of the semester, the students were graded on their assignments either online through Kaltura Media™ with video feedback or through written feedback on the Blackboard™ website. At the terminus of the semester, students were asked to voluntarily complete the verbal section of Gorham's (1988) immediacy scale.

Results

Students were asked to participate in a survey with responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Nineteen students were present to take the survey on the last day of class, resulting in a response rate of 70.4%. Any score that displayed a difference in means by at least 0.5 points (10%) was included in Table 1. The results indicated that the group receiving video-based feedback rated all but five measures higher than the written-feedback group. The top three responses yielding the greatest difference between video and written feedback (Questions 17, 12, and 15) indicated that humor, a conversational approach, and more interactions regarding experiences, examples, and questions were conveyed more fully through video feedback. However, students receiving written feedback perceived the instructor's feedback as more enthusiastic than those receiving video feedback.

Table 1. *Survey Response Scores*

Question Number and Text	m (W)*	m (V)*	m(V)-m(W)
17. In feedback for my class assignments my TA has initiated conversations with me before, after, or outside of class.	2.8	3.56	0.76
12. In feedback for my class assignment my TA uses personal examples or talks about experiences she has had.	2.8	3.44	0.64
15. In feedback for my class assignments my TA uses humor.	2.7	3.22	0.52
8. My TA displays enthusiasm in her feedback.	4.3	3.78	-0.52

* A negative score indicates a preference for written feedback (W), a positive score indicates a preference for video feedback (V).

Conclusions and Implications

Overall, students receiving video feedback perceived higher teacher immediacy than did the students receiving written feedback. However, those receiving written feedback perceived higher enthusiasm from their instructor on their assignment feedback, suggesting that perhaps instructor personality may be influential in shaping students' perceptions of immediacy, and specific personality traits may lend certain instructors to appear more enthusiastic in their written word than when verbally giving feedback. Further investigation is needed, as these personality traits, possibly including introversion and extraversion, were not a focus of the study. Additionally, more research, perhaps replication with different courses and instructors, would be beneficial in confirming results for studies similar to this by comparing video to written feedback. As video feedback can be time consuming, "multimodal blends" of feedback are recommended for classroom instructors with time constraints (Mathisen, 2012). Knowing, and implementing, the type of feedback which creates a positive influence on student learning may give student learners more direction and inspiration and create enhanced student to teacher interactions (Fukkink, Trienekens, & Kramer, 2011).

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Establishing Instrument Validity for the Professional Identity Scale in Agricultural Educators: A Focus on the Agriculturalist's Professional Identity

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Establishing Instrument Validity for the Professional Identity Scale in Agricultural Educators: A Focus on the Agriculturalist's Professional Identity

Introduction/Conceptual Framework

School-based agricultural education (SBAE) teachers have a long history of involvement in the professions of both agricultural production and education, creating unique professional identities within this population (Shoulders & Myers, 2011). While assessing the professional identities of general educators and other professionals has been the focus of research efforts for decades (Darling-Hammond & Bransford, 2005), the professional identities of SBAE teachers was identified as a gap in the knowledge base in recent years (Shoulders & Myers, 2011). While much can be learned from the research practices of professional identity studies in other professions (including general education), the unique identities and experiences of SBAE teachers may require adaptation for some of the previously used methods and instruments in order to accurately collect valid data among this population. Shoulders (2018) adapted Woo's (2013) Professional Identity Scale in Counseling (PISC) to assess the professional identities of SBAE teachers in three areas: the profession of agriculture, the profession of education, and the profession of agricultural education. This study responds to Shoulders' (2018) recommendation for researchers to "utilize appropriate parts of the PISAE to examine the professional identities of…agriculturalists to ensure the instrument is valid in portraying the identities of professionals in [this field]" (p. 288).

Validity is the degree with which an instrument measure constructs that it is supposed to measure (Huck, 2008). Instrument validity is a result of a specific location and subjects; "a test may be valid for use with one population or setting but not with another. Validity does not travel with the instrument" (Ary et al., 2010, p. 225). The PISAE was deemed to be valid for previous studies with SBAE teachers but has not been used with agriculturalists (Shoulders, 2018). Construct validity, which establishes an instrument's ability to accurately measure the degree to which a respondent possesses a particular psychological construct, can be established via convergent or divergent validity (Huck, 2008). Strong relationships between the scores of similar groups establish convergent validity, while weak relationships between the scores of dissimilar groups establish divergent validity. This research addresses the National Research Agenda's Research Priority 5: Efficient and Effective Agricultural Education Programs, as improvement of these programs relies on the collection of valid data from which to make inferences and recommendations (Roberts, Harder, & Brashears, 2016).

Methods

The purpose of this study was to assess the construct validity of the agriculturalist identity within the PISAE. Objectives were as follows: 1) describe the agriculturalist-focused professional identities of [State] agricultural producers and SBAE teachers; and 2) determine the difference in the agriculturalist-focused professional identities of these two groups.

The PISAE included the same constructs and items as the initial PISC: *Knowledge of the Profession* (11 items), *Philosophy of the Profession* (seven items), *Professional Roles and Expertise* (nine items), *Attitude toward the Profession* (nine items), *Engagement Behaviors* (14 items), and *Interaction within the Profession* (four items). Each item asked respondents to indicate their level of agreement to a statement on a 5-point Likert-type scale. The questionnaire was sent to all [State] Agriculture Extension agents, who were asked to distribute it to their clients who were agriculture producers, and to all [State] SBAE teachers, who were asked to complete the questionnaire (n = 227). An initial invitation and three reminders were sent over a

month-long period. Thirteen agricultural producers and 45 SBAE teachers completed the questionnaire, all electronically. Reliability was established for the study *a priori*, and yielded acceptable Chronbach's alpha scores for all constructs (.804 - .960) with the exception of *Philosophy of the Profession* (.674). Due to the low response rate, we strongly caution readers from generalizing the findings and conclusions herein beyond the study's respondents. However, because construct validity can be established by providing evidence that "certain groups obtain higher mean scores on the new instrument than other groups" (Huck, 2008, p. 92), the findings herein can be utilized to meet the validity-focused purpose of this study.

Findings

Mean scores on each construct are displayed in Table 1. Overall professional identity scores are also displayed. Agricultural producers and SBAE teachers shared similar agriculturalist-focused professional identities on each of the constructs. Overall, SBAE teachers' mean professional identity index was slightly higher than that of agriculturalists.

Table 1.

Mean Scores on Each Professional Identity Construct for Agriculturalists and SBAE Teachers

	Agriculturalists		SBAE Teachers	
	M	*SD*	*M*	*SD*
Knowledge of the Profession	28.69	5.27	28.82	3.58
Philosophy of the Profession	16.31	2.14	16.56	2.22
Professional Roles and Expertise	25.85	3.34	25.38	2.79
Attitude toward the Profession	45.85	6.22	49.29	3.22
Engagement Behaviors	42.38	5.81	41.20	4.81
Interaction within the Profession	26.08	4.54	26.00	4.06
Professional Identity Index	185.15	23.66	187.24	15.87

Homogeneity of variances was present for all scores with the exception of the *attitude* construct ($p = .005$). There were no statistically significant differences between the agriculturalists and the SBAE teachers on any of the construct scores, or on the overall professional identity index.

Conclusions & Recommendations

While Shoulders (2018) found SBAE teachers identified more as agriculture teachers than they did as agriculturalists, the current study found that they identified as agriculturalists to the same degree as those whose profession actually was agricultural production. These findings imply that SBAE teachers may indeed identify as agriculturalists, but that perhaps the profession of agricultural production does not lend itself to a high professional identity as measured on the PISAE. This position is supported by the notion that the original PISC was developed under a framework including an operational definition of a profession being one that requires members to be "adaptive experts who are prepared for lifelong learning that allows them to continuously to add to their knowledge and skills (Darling-Hammond & Bransford, 2005, p. 3), while agricultural production has traditionally been labeled as a blue-collar career, focusing primarily on manual labor. We recommend researchers conduct qualitative studies with both SBAE teachers and agriculturalists to better understand how the instrument aligns with and does not align with their perceptions of their own professional identities as agriculturalists. Until the PISAE can be adapted, we caution researchers against using it to distinguish between agriculturalists and SBAE teachers in their agriculturalist-focused professional identities.

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Establishing Instrument Validity for the Professional Identity Scale in Agricultural Education: A Focus on the Educator's Professional Identity

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Establishing Instrument Validity for the Professional Identity Scale in Agricultural Education: A Focus on the Educator's Professional Identity

Introduction/Conceptual Framework

Efficient and effective agricultural education programs are essential for the growth of agricultural education, under the National Research Agenda's Research Priority 5 (Roberts, Harder, & Brashears, 2016). A teacher's professional identity, comprised of an individual's background characteristics, pre-established beliefs, values, and attitudes, can greatly shape the culture and practice within an educational setting, thereby influencing the efficiency and effectiveness of a program (Simonneaus, 2000; Shoulders, 2018). Through the use of an adapted version of Woo's (2013) Professional Identity Scale in Counseling, Shoulders (2018) confirmed the position of Shoulders and Myers (2011) that agriculture teachers subscribe to a professional identity different from that of other teachers. While the adapted instrument, titled the Professional Identity Scale in Agricultural Education (PISAE), was able to determine that agriculture teachers hold professional identities that align more so with agricultural education than general education, the instrument has not been validated with educators. Shoulders (2018) recommended, "researchers utilize appropriate parts of the PISAE to examine the professional identities of educators…to ensure the instrument is valid in portraying the identities of professionals in [this] field" (p. 287). The purpose of this study was to describe the discriminant validity of the educator identity constructs within the PISAE. Discriminant validity can be established by showing "that certain groups obtain higher mean scores on the new instrument than other groups, with the high- or low-scoring groups being determined on logical grounds *prior to* the administration of the new instrument (Huck, 2008, p. 92). Therefore, the following objectives were developed to meet this purpose: 1) describe the educator-focused professional identities of expert teachers and agriculture teachers; and 2) determine the difference in identities between the two groups of teachers.

Methods

The PISAE utilized the same constructs and items as the original PISC: *Knowledge of the Profession* (11 items), *Philosophy of the Profession* (seven items), *Professional Roles and Expertise* (nine items), *Attitude toward the Profession* (nine items), *Engagement Behaviors* (14 items), and *Interaction within the Profession* (four items). Items asked respondents to indicate their level of agreement or disagreement to a series of statements, each being rated on a five-point Likert-type scale. The questionnaire was sent to all [State] agriculture teachers (n = 227), and purposefully selected expert educators, operationally defined by the Presidential Awards for Excellence in Mathematics and Science Teaching award through the National Science Foundation (n = 79). This award is the highest honor for K-12 mathematics and science educators ("About the Awards", 2018). We purposefully identified award-winning teachers of core content disciplines as those who, according to professional identity theory, should reveal high educator-related professional identities. Responses were received from 46 agriculture teachers and 10 expert educators. Internal consistency was established *a priori* and resulted in the Cronbach's alpha scores between .657 and .906. These were comparable to the reliability scores found by Shoulders (2018). While the findings herein cannot be generalized beyond the respondents, they can be used to assess the discriminant validity of the educator-related constructs on the PISAE, thereby effectively meeting the purpose of this study.

Findings

Table 1 displays each group's mean scores on the constructs, as well as their mean educator-related professional identity index. Expert educators displayed higher mean scores than agriculture teachers in every construct. The educators' mean professional identity index was nearly 50 points higher than that of the agriculture teachers.

Table 1.
Mean Scores on Each Professional Identity Construct

	Agriculturalists		Agriculture Teachers	
	M	*SD*	*M*	*SD*
Knowledge of the Profession	36.90	3.70	28.26	4.23
Philosophy of the Profession	21.40	2.76	16.80	2.09
Professional Roles and Expertise	32.80	3.52	25.52	3.51
Attitude toward the Profession	53.90	9.35	45.78	4.98
Engagement Behaviors	53.70	6.80	37.98	6.63
Interaction within the Profession	35.60	3.31	24.85	5.30
Professional Identity Index	234.30	19.92	179.20	20.84

Homogeneity of variances was present for all constructs with the exception of the Attitude construct ($p = .005$). There were statistically significant differences between expert educators' mean scores and agriculture teachers' mean scores on every construct, as well as on the overall index (Table 2). Effect sizes indicated nonoverlap between the two groups' scores in every area, with the amount of nonoverlap ranging from 58.9% to over 80% (Cohen, 1988).

Table 2.
Tests of Statistical Significance for Each Professional Identity Construct

	t	*p*	Cohen's *d*
Knowledge of the Profession	5.97	.000	2.17
Philosophy of the Profession	5.94	.000	1.88
Professional Roles and Expertise	5.94	.000	2.07
Attitude toward the Profession	2.66	.023	1.08
Engagement Behaviors	6.77	.000	2.34
Interaction within the Profession	6.14	.000	2.43
Professional Identity Index	7.63	.000	2.70

Conclusions & Recommendations

Expert educators displayed higher educator-focused professional identities than agriculture teachers, suggesting the PISAE is valid in distinguishing between those with different professional identities as educators. These results support findings by Shoulders (2018), as the agriculture teachers in the previous study displayed significantly higher identities as agricultural educators than they did as educators, suggesting their identities did not align with those of other educators. Further, Shoulders and Myers (2012) posited agriculture teachers hold different professional identities from other teachers for a myriad of reasons stemming from their background and training. We support the notion that the PISAE is an adequate instrument to distinguish between those with greater and lesser educator-focused professional identities.

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Extension's Role in Precision Agriculture: A Case Study of Auto-Steer Adoption in [state]

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Extension's Role in Precision Agriculture: A Case Study of Auto-Steer Adoption in [state]

Introduction

According to [*state*] Farm Bureau Federation (2017), there are approximately 35,800 farms in [*state*]. There has been a 6 percent decrease in the number of farms since the 2012 Census of Agriculture. Despite decreasing farm numbers, the average productivity per farm increased. In order for farmers to remain competitive, they must employ efficient production practices. One of the many ways farmers can impact production efficiency is through the use of precision agriculture. Studies have shown the use of precision agriculture technologies consistently increase net returns (Smith, et al, 2013; Shockley et al, 2012; Shockley et al, 2011). However, not all farm operators adopt all precision agriculture technologies. Extension educators are tasked with assisting diffusion of innovations, thus it is important to understand why adoption may not occur.

Auto-steer is a relatively common precision technology that uses global positioning systems to guide the travel pattern of the equipment, leaving the farmer free to monitor the operation of the implement (D'Antoni, Mishra, & Joo, 2012). It is considered a sound investment as it has been shown to save time and money as well as reduce operator errors (Schimmelpfennig, 2016; Shockley, Dillon, & Stombaugh, 2011). However, research has failed to investigate farmers' perceptions of auto-steer technology (D'Antoni, Mishra, & Joo, 2012).

Extension educators could benefit from understanding these perceptions, as this could impact educational programming designed to promote and advance the adoption of this and similar precision agriculture technologies. Aligning with AAAE's research priority addressing "new technologies, practices, and products adoption decisions" (Linder, Rodriguez, Strong, Jones, & Layfield, 2016, pg. 19), the purpose of this study was to understand farmers' decisions to adopt auto-steer technology. Our specific research objective was to identify and rank farmers' reasons for adopting auto-steer technology.

Theoretical framework

The theoretical framework for this study was Rogers's (2003) innovation-decision model. According to Rogers, the innovation adoption decision is realized through knowledge, persuasion, decision, implementation, and confirmation. In addition, Rogers described prior conditions, characteristics of the decision-making unit, and perceived characteristics of the innovation that all influence whether or not an innovation is adopted. Perceived characteristics of an innovation including relative advantage, compatibility, low complexity, trialability, and observability directly impact the decision to adopt or reject. Therefore, it is important to understand which of these characteristics adopters perceive auto-steer as possessing.

Methodology

This was part of a larger, exploratory study that examined [*state*] farmers' adoption of auto-steer. Data were collected utilizing a modified survey instrument from the University of Tennessee Department of Agricultural and Resources Economics. The 17 question instrument was administered through Qualtrics, and a link was emailed to [*state*] row crop farmers with two follow-up reminder emails to increase response rate. For the purpose of this study, question 10 asked producers to rate the importance of specific factors with regard to the farmer's decision to use auto-steer. These factors, intended to correspond to Rogers's characteristics of an innovation,

included profitability, integration into existing equipment, the difficulty of learning to use, trying it beforehand, positive environmental benefits, being able to see others us auto-steer before purchase, and saving time.

Results

Of 1,154 [*state*] row crop farmers emailed the survey link, 152 survey instruments were completed, a response rate of 13.1%. A majority of respondents indicated they grew corn (80%) and/or soybeans (85.5%), followed by cotton (48.7%), wheat (23%), rice (15.8%), and others. The mean age of respondents was 48 years, ranging from 19 to 82. Mean farm acreage was just over 3,000, ranging from 60 acres to 16,000 acres. The mean number of years farming was 26.5. Of the respondents, 119 (78.8%) indicated they use auto-steer on one or more pieces of farm equipment, and of those who had adopted auto-steer, most adopted in 2010.

Nearly 80% of respondents reported using auto-steer in their farming operation. Those respondents were subsequently asked to rate the importance of several factors in their decision to use auto-steer. Using a five-point Likert scale, where 1 indicated "not important at all" and 5 indicated "absolutely essential", adopters reported that saving time was the most important reason ($m = 4.44$), followed by profitability ($m = 4.00$), ease of integration ($m = 3.90$), positive environmental benefits ($m = 3.50$), difficulty of learning ($m = 3.14$), seeing others use the innovation ($m = 2.92$), and being able to try the equipment beforehand ($m = 2.91$).

Conclusions

Knowing which factors affect farmers' adoption decisions is imperative for the Extension Service to better prepare and deliver educational programming that benefits farmers. Rogers (2003) suggested that characteristics including relative advantage, compatibility, low complexity, trialability, and observability impact adoption rate. In our study, adopters reported that saving time and increasing profitability were the most important reasons to adopt auto-steer. These factors speak to the relative advantage of auto-steer. Interestingly, our respondents indicated that seeing others use auto-steer and being able to try auto-steer were less important in their decision to adopt which represent observability and trialability, respectively. Extension education methods frequently rely on field trials and corresponding field days that allow for trialability and observability of innovations. However, our study results suggest that these methods may have had less impact on their decision to adopt this specific innovation.

Implications/Recommendations

This study was limited in scope, investigating auto-steer adoption by [*state*] row crop farmers. However, useful insights may be gleaned for similar clientele groups. As change agents, Extension educators frequently apply Rogers' innovation decision model, designing programming to highlight the attributes of innovations that should positively impact their rate of adoption. In order to be efficient with resources, it is important to understand which attributes are most important to farmers. Certainly different innovations possess varying degrees of each attribute identified by Rogers, however, our study suggests that farmers place the most importance on relative advantage. Therefore, it may be wise to focus educational efforts regarding precision technology on demonstrating the benefits those technologies offer over current or outdated technologies in use. Further research on precision technology adoption should extend beyond row crop farmers and additional technologies should be studied to better understand farmers' adoption decisions.

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Faculty perspectives on and strategies for mentoring underrepresented minority students in research

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Faculty perspectives on and strategies for mentoring underrepresented minority students in research

Introduction

The 2009 report from the National Research Council (NRC), *Transforming Agricultural Education for a Changing World* strongly recommended that academic institutions broaden undergraduate education so that students master a variety of transferable skills in addition to content knowledge via participation in high-impact practices (Kuh, 2008) including undergraduate research, service-learning, internships, and focused international educational experiences. McNair & Albertine (2012) state that "our society can no longer afford to reserve 'islands of innovation' for a select group of students while others, often students traditionally underserved, receive an education more suited to the industrial age" (p.4). Programs aimed at increasing student success must address issues related to the diverse nature of students who are entering higher education today. Student diversity can be broadly defined to include categories such as: gender, race/ethnicity, generational status, class, residential and immigrant status, academic preparation, disability, learning style preference and worldview (Rendón, 2006). Within these categories there are some groups that are underserved populations in particular settings. For example: despite underrepresented minorities (URM) comprising 40% of K-12 students nationally, [University]'s Colleges of Agriculture and Life Sciences (CALS) and Natural Resources and the Environment consistently enroll 11% of this population.

High-impact practices, which often include developing strong, reciprocal partnerships between students and faculty, is an essential component of engaging students in socially and intellectually in meaningful ways (Kuh, 2008). URM student persistence is positively impacted by participation in undergraduate research (Brownell & Swaner, 2009) and interactions with undergraduate research mentors caused URM students to have increased confidence and positive outcomes related to professional socialization, such as understanding of potential careers (Thiry & Laursen, 2011). The purpose of our study was to understand the experiences that faculty members in a CALS have had in working with URM students in their research groups. Our findings contribute to AAAE Research Priority Three (Stripling & Ricketts, 2016).

Theoretical framework

Our study is grounded in sociocultural theories of learning (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991; Wenger, 1998) wherein the context of the learning experience (with its attendant social and cultural aspects) is central to a learner's construction of new knowledge. We draw on Lattuca (2002) and Lattuca and Creamer's (2005) use of sociocultural traditions to theorize faculty work itself as learning; an embodied process that emphasizes the significance of socially-constructed and tool-mediated activity. Using this perspective, we view the practice of working with URM students in research labs as an opportunity for faculty learning about how to meet the needs of these students.

Methodology

Participants in this qualitative study were a purposeful sample of faculty who have prior experience working with URM students in their research program. They were identified through participation in a CALS initiative that partnered URM youth with faculty for a summer research

experience. We developed an open-ended interview guide with questions based on an *a priori* table constructed from an extensive literature review in the areas of minority student experiences and perspectives in higher education, appreciative advising, and mentorship. We conducted six 30-60 minute audio-recorded interviews. The specific analysis process followed the constant comparative method in which "joint coding and analysis" (Glaser & Strauss, 1967/1995, p. 103) was conducted where "each incident" was "compared with other incidents for similarities and differences.…to identify properties and dimensions" (Corbin & Strauss, 2008, p. 73) that were specific to each category as they were developed.

Results/findings

The findings included both recommendations as well as areas of potential need for continued professional development for faculty seeking to engage URM students in their research laboratories. Participants in the study emphasised the primary recommendation was for faculty to ensure they establish time and structure for one-on-one meetings with all laboratory students. Faculty explained that this was critical to ensuring students were confident in their laboratory work and had a space in which to ask questions and express concerns. These meetings are most successful if faculty adhere to the second recommendation, to take time to build relationships with all of their laboratory students. Finally, the experienced faculty recommended that their peers ensure they treat all of their students equally, to ensure there is no distinguishing differences between student groups. Faculty in this study emphasised that they did not want to ever have URM students think that they were not equal to other students in their laboratory. Findings from this study indicated that few faculty are taking time to learn about the cultures of students who might have backgrounds different from theirs. The researchers also found that few of the participating faculty were encouraging their URM students to have multiple mentors.

Conclusions/Implications/recommendations/impact on profession

Efforts to increase diversity in colleges of agriculture at 1862 Land Grants are underway nationally. These universities are predominantly white institutions (PWIs) and majority (white) faculty in colleges of agriculture were often trained at similar institutions. Viewed through a sociocultural lens, they likely learned mentoring practices through their own training that reflect the cultural context of their discipline as expressed through the actions of their mentors and the social structures that exist at PWIs. If we are recruiting URM students into these colleges and encouraging them to participate in opportunities such as undergraduate research with faculty, the implications of our work are profound. Agricultural education professionals have a key role to play in efforts to prepare faculty colleagues in other departments to work with URM students, such as leading initiatives to train majority faculty to attend to the array of potential needs that URM students may have due to their unique experience of climate within their home department on a PWI campus. Particularly, there is an opportunity for development of continued professional education (CPE) experiences for college of agriculture faculty help support student mentorship that engages multiple professional mentors who are able to support different aspects of URM student experiences. Interestingly, there is also a need for faculty to engage in CPE programming that helps to increase individual appreciation for other cultures.

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Poster Type (Research)

Fostering Academic Success for University Agriculture Students: The Role of Social Self-Efficacy on First-Year Grade Point Average

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Poster Type (Research)

Introduction

Currently, more young adults from 18 to 24 years old decide to enroll in college than any previous generation (Taylor, Fry, Wang, Dockterman, & Velasco, 2009). However, even with the undergraduate enrollment rates at an all-time high, universities continue to experience low academic performance and high attrition rates (Devonport & Lane, 2006). Walsh and Robinson Kurpuius (2016) noted that a student's freshman year can significantly impact their future in higher education. Such attrition is often linked to students' poor academic performance (Walsh & Robinson Kurpius, 2016). However, failure to socially and academically integrate first-year college students into university environments has also been shown to demonstrate negative effects. For example, Tinto (1993) noted that a student's integration into an institution is critical to their academic performance and persistence (Walsh & Robinson Kurpius, 2016). Because of this, *social* factors have been recognized as a presage variable that foregrounds students' success in higher education (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). A need existed, therefore, to examine the role of social factors in agriculture students' academic success.

Theoretical/Conceptual Framework

We grounded this investigation in Bandura's (1994) social cognitive theory. Bandura (1994) theorized that self-efficacy could be improved through four key experiences: (1) mastery experience, (2) vicarious experiences, (3) social persuasion, and (4) physiological and emotional states. Using this lens, the current study was positioned to examine *social self-efficacy*, which is defined as "confidence in one's ability to engage in the social interactional tasks necessary to initiate and maintain interpersonal relationships in social life and career activities" (Anderson & Betz, 2001, p. 1). As such, social self-efficacy helps facilitate greater social integration and positively affects students' retention and academic achievement (McIntyre, 2017).

Purpose and Objectives

This study's purpose was to examine relationships among freshmen College of Agriculture students' social self-efficacy and their first-year grade point average (GPA) at Louisiana State University. The American Association for Agricultural Education's National Research Agenda Research Priority 3: *Sufficient Scientific and Professional Workforce* supported the need for this study because it called for future research to address the challenges of attractiong new inviduals to the agricultural industry in the 21st Century (Stripling & Ricketts, 2016). Two objectives guided the study:

1. Describe the personal characteristics (i.e. gender, age, academic classification, and ethnicity) of [University] College of Agriculture freshmen who completed a one-credit introductory course during the fall semester of 2017.
2. Describe relationships among freshmen College of Agriculture students at Louisiana State University' s social self-efficacy and their first-year GPA after completion of a one-credit introductory course during the fall semester of 2017.

Methods

The target population of this study consisted of all students enrolled in a one-credit introductory course during the fall 2017 semester ($N = 237$). Data were collected at the end of semester via Qualtrics using a web-based instrument. Of the participants, 211 students completed the instrument, which resulted in an 89% response rate. To facilitate procedures, we used Fan's and Mak's (1998) social-efficacy scale to measure four constructs: (1) social difficulties, (2) social

confidence, (3) sharing interests, and (4) friendship initiatives. The instrument was comprised of 20-items and presented on a 5-point Likert-type scale. Each of the constructs yielded satisfactory ($\alpha > .70$) post-hoc reliability coefficients. Negatively worded items were reverse coded so that high agreement indicated a higher self-efficacy. Face and content validity were determined by one agricultural education faculty member and four agricultural education graduate assistants for the course. Data were analyzed utilizing SPSS version 26 for Macintosh. Descriptive statistics, including means, frequencies, and percentages were utilized to address objective one. For objective two, we used bivariate correlational analysis in which Pearson's *R* correlational coefficient was employed. Then, Davis' conventions (as cited in Miller, 1994) were used to assess the magnitude of correlation coefficients: $01 \geq r \geq .09$ = *Negligible*; $.10 \geq r \geq .29$ = *Low*; $.30 \geq r \geq .49$ = *Moderate*; $.50 \geq r \geq .69$ = *Substantial*; and $.70 \geq r \geq .99$ = *Very High.*

Results

Regarding participants' characteristics, the majority (74.4%; *f* = 157) of respondents were female and did not live in a College of Agriculture sponsored residential living and learning environment (53.1%; *f* = 112). Further, students were primarily white (78.2%; *f* = 165). The second objective explored relationships among students' social self-efficacy and their first and second semester GPA (see Table 2). Overall, there were no statistically significant relationships ($p > .05$) reported (see Table 1).

Table 1

Relationships Among Student' Social Efficacy and their First and Second Semester GPA

Social Efficacy Construct	*First Semester GPA*			*Second Semester GPA*		
	N	*p*	*r*	*N*	*p*	*r*
Social Difficulties	204	.794	.018	194	.878	.011
Social Confidence	203	.647	.032	194	.612	.037
Sharing Interests	203	.395	.060	193	.501	.048
Friendship Initiatives	203	.835	-.015	193	.968	.003
Social Efficacy Total	199	.443	.055	190	.447	.056

Conclusion/Limitations/Recommendations

Although existing research suggested that social self-efficacy and academic success are deeply intertwined (Bandura et al., 1996), this study's findings reported no statistically significant relationships ($p > .05$) among the variables. It is possible that our analyses were limited due to the unique context as well as other barriers associated with using quantitative instruments. Perhaps, therefore, future studies should consider wether a qualitative approach might yield new insight into this phenomenon. For example, by viewing this phenomenon from a naturalistic lens it could help open-up new possibilities for future research, theory, and practice. Because of the lack of significant findings in this study, we also recommend expanding the quantitative instrument to examine concepts such as students' social support and interaction with peers.

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Is 'Rural' a Risk Factor for Freshmen-to-Sophomore Attrition in a College of Agriculture?

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Introduction

In 2015, 9.7 million students were enrolled in rural public schools (Byun, Meece, & Agger, 2017; Johnson, Showalter, Klein, & Lester, 2014; U.S. Department of Education, 2015). Rural students encounter unique challenges in accessing and completing higher education including a lower likelihood of enrolling in college, socioeconomic hardship, lower parental education and expectations, lack of academic preparation, lower levels of persistence, and difficulty transitioning to college (Byun, Irvin, & Meece, 2012; Byun, Meece, & Irvin, 2012; Byun et al., 2017). Rural students who pursue higher education often experience additional challenges in adapting to both the university and to more urbanized cultures, placing them at greater risk of non-retention, especially early in their academic careers (Schonert, Elliot, & Bills, 1991). Despite the large rural student population, there is a lack of research on rural students' persistence in higher education, especially between the freshman and sophomore years (Schonert et al., 2001). Priority 3 of the American Association for Agricultural Education's research agenda encouraged agricultural educators to determine factors affecting students' decisions to enter and complete postsecondary agriculture programs (Stripling & Ricketts, 2017).

The purpose of this study was to determine if rural students enrolled in a college of agricultural, food and life sciences (AFLS) were more at risk for non-retention between their freshmen and sophomore year in comparison to students from non-rural areas. The following research objectives guided the study: 1) to determine the risk ratio for non-retention for rural and non-rural human environmental sciences (HESC) majors, and 2) to determine the risk ratio for non-retention for rural and non-rural agriculture majors.

Methodology

After IRB approval, the University of Arkansas Office of Institutional Research provided us with a data file containing student demographic (major and home county) and freshmen-to-sophomore retention data (retained or not retained) for all in-state, new freshmen entering AFLS) between 1998 and 2015 ($N = 2639$). We used the Rural-Urban Continuum Code (USDA-ERS, 2013) to classify students as either rural or urban based on their home ZIP code. We analyzed data using cross tabulations and risk ratios. According to Osborne (2006), a risk ratio is the percentage incidence of an outcome for one group (PI_1) relative to the percentage incidence of an outcome for a second group (PI_2). In the context of this study, the two groups were rural (PI_1) and non-rural (PI_2) students and the outcome of interest was non-retention for the sophomore year. We tested risk ratios for statistical significance at $p < .05$. Finally, because of previously identified differences between agriculture and HESC students in AFLS (Estes, Estes, Johnson, Edgar, & Shoulders, 2016)), we ran separate analyses for HESC and agriculture majors.

Results

Among HESC majors ($n = 807$), 13.14% of rural students did not return for their sophomore year compared to 14.72% of non-rural students (Table 1). The risk ratio of 0.89 was not significantly different from 1.0, indicating no difference in the relative risk of freshman-to-sophomore non-retention for rural versus non-rural HESC majors.

Table 1. *Frequencies, Percentages and Risk Ratios for Non-Retention of HESC Majors*

Home	Non-Returners (*f*)	Returners (*f*)	Total (*f*)	Returners (*%*)	Risk Ratio	CI_{95} Risk Ratio *LL*	*UL*	*Z*
Rural	23	152	175	13.14	0.89	0.58	1.37	0.52^{NS}
Non-Rural	93	539	632	14.72				

^{NS} = Not significant ($p > .05$)

Among agriculture majors ($n = 1832$), 12.94% of rural students and 17.98% of non-rural students did not return for their sophomore year (Table 2). The risk ratio of 0.72 was statistically significant ($p < .01$) and indicated rural agriculture majors were only 72% as likely to be non-returners compared to non-rural agriculture majors. Thus, rural agriculture majors were more likely to return as sophomores than were non-rural agriculture majors.

Table 2. *Frequencies, Percentages and Risk Ratios* f*or Non-Retention of Agriculture Majors*

Home	Non-Returners (*f*)	Returners (*f*)	Total (*f*)	Non-Returners (*%*)	Risk Ratio	CI_{95} Risk Ratio *LL*	*UL*	*Z*
Rural	73	491	564	12.94	0.72	0.56	0.92	2.64**
Non-Rural	228	1040	1268	17.98				

**$p < .01$

Conclusions

Previous research indicates that students from rural areas often have trouble in transitioning to college (Byun, Irvin, & Meece, 2012). However, our study found a significant advantage in freshman-to-sophomore retention for rural agriculture majors and no significant difference in retention for rural HESC majors. We conclude rurality is not a risk factor for non-retention among AFLS students and is actually advantageous in the retention of agriculture majors.

Implications/Recommendations/Impact on Profession

Our results do not support previous studies concerning rurality and retention (Byun, Irvin, & Meece, 2012; Byun, Meece, & Irwin, 2012; Byun et al., 2017). However, because these studies were conducted across academic colleges, while our study was conducted within a college of agriculture, the possibility exists that rural students have an affinity for colleges of agriculture that both draws them to these colleges (Estes et al., 2016) and promotes retention. This may be particularly true for rural agriculture students and may be the result of a self-identity with agriculture and agricultural careers (Shoulders & Myers, 2011). In addition, faculty and staff in AFLS and similar colleges may hold values and norms more consistent with those of rural students, decreasing their difficulty in adapting to the college environment (Shonert et al., 1991). We recommend additional research to test these hypotheses.

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Poultry Labeling: Knowledge and Perceptions among Adolescents

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Poultry Labeling: Knowledge and Perceptions among Adolescents

Introduction

The popularity of niche markets in the poultry industry have been on the rise as consumers have become more concerned about the issues involved with the production of their food (Bernard, Pan, & Pesek, 2007). This involves issues like food safety, animal welfare, and sustainability. Products labeled in regards to these attributes come with a higher price tag. It is commonly argued these trends in consumer preference are based primarily on perception more than scientific fact (Cervantes, 2015). Another study by Pew Research Center (2015) concluded 88% of scientists surveyed agreed there was no food safety risk in GMO foods, however, only 37% of the public agrees with this view. Examples of education gaps between the scientist and the general public are common in the poultry industry (Pray, 2016).

The knowledge of participants is important to understand in order to assess the understanding of what is required of regulated food labels. The accuracy of this knowledge will impact the consumers' perceptions of the product and those perceptions will guide buying behavior. The theory of planned behavior (TPB) showcases the link between these beliefs and behavior. This model was developed to predict an individual's intention to engage in a behavior. In Ajzen's (1991) model, three considerations impact an individual's intention to perform a behavior: attitudes toward the behavior, subjective norms, and perceived behavioral control, which are each addressed through the objectives of this study. When these factors become known, recommendations to increase purchase behavior of poultry products can be developed. This study works to address the AAAE National Agricultural Education Research Agenda research priority 1, which address the public's understanding of agriculture (Roberts, Harder & Brashears, 2016).

The purpose of this study is to determine the knowledge and perceptions of adolescents about the labeling of poultry products. Objectives that guided the study included: (1) Describe adolescents' knowledge and perceptions of the labeling of poultry products; (2) describe adolescents' perceived trust in labels of poultry products; and (3) describe important attributes to adolescents when purchasing poultry products.

Materials and Methods

This study was conducted in a descriptive research design. Quantitative data was collected to numerically represent the preferences of the adolescents in the population. The subjects selected were youth involved in the [State] 4-H State [Convention] competition. All subjects were between the ages of 14-18. Students were chosen because of the accessibility of a large population of youth (N=400) with access to consent from a parent or guardian to participate in the study. Initial permission was obtained to collect data at this event by event organizers. Parental consent forms were turned in with [Convention] participant registration materials to ensure parental consent for all subjects under the age of 18. Data was collected during the opening and closing ceremonies presented at the [Convention] by administering paper surveys. This instrument was originally created by Samant (2015) and then adjusted to meet the objectives of the study surveying youth. The modified instrument was reviewed by a panel of experts for face and content validity. This panel of experts consisted of three professors in agricultural communications and one in human and environmental sciences with expertise in youth development and cognitive thinking. The resulting instrument was tested in a pilot study

of 12 participants in a local church youth group. The pilot study was conducted by youth aged 14-18 who would not be attending [State] [Convention]. The youth participating in the pilot completed a cognitive analysis to ensure clarity and validity of the instrument. Internal consistency was confirmed based on the responses of the pilot study. Using SAS, a coefficient of stability of 0.175 was determined. This coefficient helped to establish the reliability of the instrument. The resulting survey consisted of four parts: 1. Label on chicken products, 2. Consumer behavior for chicken products, 3. Consumer Preference, and 4. Demographics

Results

The demographics of this study focused on 4-H students at a [State] [Convention]. The sample consisted primarily of white (81.7%, n = 67) females (64.6%, n = 53) who lived on a farm (59.8%, n = 49). There was a high correlation between responses of understanding and trust. The higher the participant rated understanding of a label, the higher they rated trust. While participants claimed to have an above average understanding and trust of the product labels, presence of the label did not have as great of an impact on purchase decision. Knowledge of the meaning of each label varied with 26% (n = 21) of participants answering correct for *no added hormones*, 61% (n = 49) answering correct for *non GMO project verified*, 47% (n = 38) answering correct for *USDA organic*, and 44% (n = 35) answering correct for *no antibiotics ever*. Although perceived understanding was rated above 50% for each of the labels, actual knowledge was determined to be lower than 50% for three of the four labels. Participants also ranked the importance of six attributes in purchase decisions. The most important attribute was taste, followed by price, nutritional benefit, label, brand, and packaging design.

Discussion

Results of this study help us understand the outcomes of the desired objectives. These objectives focused on adolescents' knowledge, perceptions, and perceived trust in labels on poultry products. An additional objective was to determine important attributes to adolescents when purchasing poultry products. The results showcase a gap between actual knowledge and perceived understanding of participants. This creates an opportunity for education. When consumers are confused about what a label means, it is more difficult to be confident in decisions or justify spending extra on a product with a niche market label. The low score on knowledge of the meaning of the *no added hormones* label was not surprising. It is common to hear claims birds are given hormones to increase body weight. Few people know hormones have been banned from the poultry industry since 1906 (Watkins, Clark, & Thaxton, 2011). The correlation between understanding and trust is interesting as well. Being knowledgeable increases trust in a product. The perceived trust in the product label very closely matched participants understanding. When trust is absent between a company and consumer, all credibility is lost. To sell a product with labels that relate solely to production processes, trust has to be present. These labels represent attributes of a product that cannot be seen at the point of sale. Any added cost a consumer is willing to pay is because a trust created by product label claims. While the participants showed some partiality to products with the production labels, they did not claim labels to be among the primary deciding factors in the purchase decision. These adolescents placed a higher priority on taste, price, and nutritional benefit. These are attributes that are clearer to understand and trust. Credibility of these attributes can be established much easier through previous experience and nutrition labels.

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Ringing the Schoolhouse Bell: Identifying Competencies, Attitudes and Perceptions of Teacher Success and Longevity

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Introduction

Agricultural education journals are replete with the causes and factors limiting agriscience teacher's tenure in the classroom. Therefore, the value of successful agricultural education teachers and their longevity in the secondary classroom is vital to the continued training and development of future agricultural professionals. Agricultural Education teacher shortages create negative consequences on secondary agricultural education programs and student learning nationwide. A potential solution to the attrition of agriscience education professionals is the assessment of repeatable experiences found in successful agriscience teachers. Walker, Garton, and Kitchel (2004) investigated agriscience teacher retention in relation to the level of job satisfaction at different career stages. After their first year of teaching, agriscience teachers were generally satisfied with their position (Walker et al., 2004). Job satisfaction is only one piece of the puzzle when it comes to teacher retention. The characteristics determining teachers' expectations of teaching longevity was examined by Edwards and Briers (2001). Relationships between departmental size, agricultural work experience, and gender were found to be significant when examining additional expected teaching years (Edwards & Briers, 2001). Knobloch and Whittington (2003) investigated teacher efficacy related to different levels of career commitment. Teachers with higher career commitment did not experience a change in their teacher efficacy during a ten-week period, while teachers with lower career commitment did experience a decline in their teacher efficacy during the same period (Knobloch & Whittington, 2003). The need for agriscience teachers is well documented. Replicable traits and experience impacting teacher retention in agriscience classrooms is worthy of further examination.

Theoretical Framework

Weiner (1972) conceptualized Attribution theory as an assumption of why people make the choices and actions leading to an event or behavior. Attribution theory (Weiner, 1972) served as the conceptual framework for this study and was bound using Wiener's (1972) three-stage process: 1) behavior must be observed or perceived, 2) behavior must be determined to be intentional, and 3) behavior should be attributed to internal or external causes. Each process supports successful habits and classroom longevity of secondary agricultural education teachers and provides context for teacher choices and experiences. Schunk (2008) reported attributions are the "perceived causes of outcomes" (p. 455). Knowing that teachers make professional and personal decisions based on experience, education, family, and career needs, understanding the rationale for these decisions is paramount for teacher retention and success. Heider (1958) cited by Weiner (1972) distinguished behavioral choice as a means of two determinants: "can: the characteristics of the individual including intelligence and ability" (p. 204) and "try: determined by the momentary intentions and effort expenditure of the individual" (p. 204). The purpose of this research study alights closely with research priority three of the American Association of Agriculture Education's research area, question two "what methods, models, and practices are effective in recruiting agricultural leadership, education, and communication practitioners (teachers, extension agents, etc.) and supporting their success at all stages of their careers" (Stripling, et. al., 2016, p. 31).

Methodology

This qualitative study had a semi-structured interview discussion approach. Ten secondary agriscience teachers from Alabama participated in this study aimed to identify factors

influencing teachers to remain in the classroom. Participants were selected based on geographic location in Alabama, a minimum of five years teaching experience in agriscience education, and were certified through undergraduate or graduate training in agriscience education. Two of the questions pertained to teacher satisfaction in the classroom; 1) how would you describe your feelings of satisfaction in the teaching and advising you provide to students as a factor of your remaining in the classroom? 2) In your opinion, how has assisting students to attain their individual goals been an important factor of your remaining in the agricultural education classroom?

Results

Given the two questions pertaining to teacher satisfaction, three themes emerged. Participants indicated their desire to teach as a calling. Participants emphasized that they couldn't imagine doing anything else than teaching. Teaching was indicated as a passion and participants noted they felt drawn to teach. Participants also felt more involved in community events. This helps them feel more connected to their students and a desire to stay in the classroom because of the students they teach. Participants also indicated their students' success as a driving factor for remaining in the classroom. Student success was indicated to be closely linked to teachers' job satisfaction. The success of their students fuels agriscience teachers. Participants emphasized how you cannot put a price on seeing your students achieve.

Conclusions

Participants in this study indicated the reason agriscience teachers remain in classroom is related to their connection with the students and their students' success. The unique nature of agriscience teachers contributes to their ability to feel more connected with their students. Feeling more connecting and being more involved in your students' achievements, directly relates to teachers' feelings of job satisfaction when seeing their students succeed.

Implications and Recommendations

This study was completed with a small sample size and focused on only one geographical area of the county. Future studies should be completed in differing geographical areas. They should also include larger sample sizes. Follow-up also needs to be conducted with study participants on the nature of what techniques they use in the classroom to promote the success of their students. Their teaching methodology and practices should be evaluated for impacts on student success.

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Risk and Dread Perceptions of Secondary Agricultural Student: An Exploratory Study Using the Psychometric Paradigm

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Risk and Dread Perceptions of Secondary Agricultural Student: An Exploratory Study Using the Psychometric Paradigm.

Introduction/ Need for Research

Agriculture continues to be considered a hazardous industry that results in fatality, injuries, and health concerns. According to the National Institute for Occupational Safety and Health (2018), over 700,000 youth completed farm work and, in 2014, an estimated 12,000 were severely injured. A comprehensive understanding of safety is needed in the secondary agriculture classrooms. A continuous concern of high school educators is safety in the laboratory setting (Chumbley, Hainline, & Haynes, 2018). Even though, laboratory activities serve as a main portion of curriculum in many agricultural programs (Phillips, Osbourne, Dyer, & Ball, 2008). Literature suggests a greater need for safety training in the preparation of preservice agricultural teachers (McKim & Saucier, 2011; Ridolphi & Retallick, 2015). Without a perceived safe environment in the laboratory, learning and skill acquisition cannot take place (McKim & Saucier, 2011). Threeton, Ewing, and Evanoski (2015) emphasized that safety in the classroom and/or laboratory directly influences the success of the learning environment. The purpose of this study was to understand risk and dread perceptions of secondary agricultural students.

Risk perception in youth has been explored in timely hazards including the use of tobacco (Ambrose et al., 2017), marijuana (Stratton et al., 2015), texting and driving (Rhodes & Pivik, 2011), and obesity (Ranzenhofer et al., 2008). In the same regard, an exploration of students' perceived risk (probability of danger, hazard, or threat) and perceived dread (extent of fear, distress, or concern) within secondary agricultural education students might provide insight for making classrooms/laboratories a safer environment. The goals of the exploratory study were threefold: (1) To what extent is the perceived risk of laboratory, farm, and safety skills in high school agricultural education students; (2) to what extent is the perceived dread of laboratory, farm, and safety skills in secondary agricultural education students; and (3) what is the correlation between perceived risk and dread within the respected skills?

Conceptional/Theoretical Framework

The psychometric paradigm model explores the gap in risk perception between experts and citizens on hazards: natural and societal. The psychometric paradigm consists of seven constructs: (1) overall perceived risks, (2) voluntariness of risk, (3) knowledge about risk, (4) chronic-catastrophic, (5) calm-dread, (6) severity of consequences, and (7) control over risk (Slovic, Fischoff, & Lichtenstein, 1980). Slovic, Fischoff, & Lichtenstein (1980) imply the main limitations of the psychometric paradigm is the lack of contributions of socio-demographics and cultural influences on risk perception. Yet, the psychometric paradigm remains renowned in efforts to understand risk perception.

Methodology:

The study was conducted in eight agricultural mechanic classrooms in seven states throughout the Southeast. One hundred and fourteen students represented the convenient sample. The original instrument developed by Lichtenstein et al. (1978) measured the perception risk in societal hazards. Written permission was granted to modify the instrument to perceived risks of secondary laboratory and safety skills in agricultural education classrooms. In the scope of an exploratory study, the modified instrument included the overall risk perception and calm-dread frameworks of the psychometric paradigm. The authors developed three themes that reflected the

laboratory, farm, and safety skills and one theme of interest among teenagers not related to agriculture. Eight activities were identified in each of the four themes: 1) Laboratory activities (cleaning the shop, cutting metal, drilling, electrical work, measuring, painting, plumbing, and welding); 2) safety activities (hydration, lifting, proper clothing, protecting your hearing, protecting your skin, protecting your vision, reading labels, and time management); 3) farm activities (changing a tire, feeding livestock, halter breaking, hauling grain, operating a tractor, record keeping, riding a horse, and working livestock); and 4) nonagricultural youth activities (dating, driving, eating school lunch, going to a party, hunting, making a new friend, playing sports, and taking a test). The goal was to compare students' perceived risk and dread in relation to laboratory tasks. All questions were designed as a 7-point Likert scale: overall perceived risk from 1 (Extremely Not Risky) to 7 (Extremely Risky) and calm-dread from 1 (Extremely Calm) to 7 (Extreme Dread). The anchor "4" served as neutral in both areas.

Results/Findings

The secondary students from the preselected eight classrooms perceived most activities as low dread and low risk. Participants considered all 32 activities to be calm (absent of dread). The majority of activities (28 of 32) were considered low risk by participants. The four activities that were perceived high risk were electrical work, cutting metal, welding, and working livestock. Electrical work was the only activity considered extremely risky by the participants. Electrical work, halter breaking, and working livestock were the only items that students did not identify as dreadful or calming. When taking the average of the summated constructs, Laboratory activities were considered to be calm (absent of dread) and moderately high risk. The remaining constructs of standard safety activities, working livestock, nonagricultural, youth activities were all considered calm and low risk, as perceived by the students.

Conclusions/Implications/Recommendations

The findings suggested that students are calm about activities in the secondary laboratory and do not perceive these laboratory activities as risky. To properly integrate safety into agricultural curriculum, educators should further seek understanding of student's perceived risks and dread of laboratory activities. The findings may suggest that adolescents do not properly perceive risk in activities that may have high safety concerns. Including all seven constructs of the psychometric paradigm to explore how students form their perceptions about risks should further the research. Additional research that gauges perceived risks of in-service educators may serve value in preparing pre-service educators to bridge the gap between perceived risk and actual hazards of laboratory activities. Such knowledge could open a discussion for correlations between teacher and student perceptions on risk/dread. The question still arises as to whether the low dread/low risk is beneficial to youth or does moderate to high dread and risk equate to higher concern; thus, higher concern would elevate motivation for being educated about the safety risks (Marshall, 1996).

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

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

Introduction

Researchers have documented the many barriers preventing teachers from effectively engaging students in learning experiences within agricultural laboratories (Lambert, Stewart, & Claflin, 2018; Shoulders & Myers, 2012; Williams & McCarthy, 1985). Among these barriers are funding, accessibility, and safety (Lambert, et al., 2018; Ma & Nickerson, 2006; Shoulders & Myers, 2012), leading to innovations designed to overcome these barriers. One of these such innovations is the simulated laboratory, designed to offer students the learning outcomes of a traditional laboratory through a scenario that is analogous to that in the traditional laboratory, but conducted outside the lab (Ma & Nickerson, 2006). The use of analogy-based examples within simulated laboratory experiences has been shown to offer a myriad of positive learning outcomes while overcoming some of the barriers to traditional laboratory experiences (Pyatt & Sims, 2007). The theory of planned behavior (Ajzen, 1991), in the context of curricula, suggests that teacher motivation to teach specific topics are dependent upon their attitudes, perceived control, and subjective norms regarding these topics. Researchers (Johnson & Wardlow, 2017; Paulsen, Han, Humke, & Olde, 2014) have found that teachers who participate through teacher workshops have a progressive impact on enhancing self-efficacy in teaching STEM topics, leading to a positive outcome of incorporating these topics into the curriculum. The purpose of this study was to determine the effects simulated laboratories have on teachers' self-efficacy towards and intent to teach simulated laboratories.

Methods

The population for this study included agriculture teachers, science teachers, and extension agents ($N = 19$) participating in a one day inservice workshop in the fall of 2018. Participants spent the day being actively engaged in the simulated laboratory experiences. Participants first went through a session containing information about simulated laboratory experiences and analogies. University undergraduate pre-service teachers then facilitated participants' experiences as they performed each of four simulated laboratory experiences: animal dissection, genetic inheritance in animals, blood collection, and identifying parasites in animal feces. Each of these simulated laboratory experiences was designed to meet the cognitive ability and facility access common to high school agriculture programs. At the conclusion of the workshop, educators completed an adapted version of the Science Teaching Efficacy Beliefs Instrument (Enochs & Riggs, 1989) measuring their self-efficacy and intent to teach with simulated laboratories. Each instrument contained nine Likert-type items with a retrospective pretest (Gouldthorpe & Israel, 2013) and a traditional post-test. Eight summated items measured pre- and post-workshop self-efficacy towards simulated laboratories and one stand-alone item measured teachers' intent to teach simulated laboratories in the next school year. Nineteen participants (100%) completed the evaluation instruments. Data were analyzed using descriptive statistics; Cohen's *d* (Cohen, 1988) was used to describe the magnitude of changes in attitude towards and intent to teach simulated laboratories.

Results

Throughout the workshop, participants developed increased levels of self-efficacy toward and intent to teach simulated laboratories (Table 1). Mean scores for self-efficacy in teaching

simulated laboratories and intent to teach simulated laboratories moved from essentially agree to strongly agree on the four-point scale. The self-efficacy scores indicated a large effect size via Cohen's *d*, while their intent to teach indicated a small effect size via Cohen's *d* (Cohen, 1988). The pretest means indicated teachers agreed they would teach simulated laboratories prior to completing the workshop; workshop participation only slightly increased their level of agreement.

Table 1. *Effects of Workshop Participation on Teachers' Self-Efficacy towards and Intent to Teach Simulated Labs*

	Pretest		Posttest		
Attitude toward teaching:	*M*	*SD*	*M*	*SD*	Cohen's *d*
Simulated Lab Self-Efficacy	2.97	0.43	3.34	0.35	1.27
Intent to teach	2.78	0.78	3.26	0.73	0.46

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

Conclusions & Recommendations

The one day workshop was effective in enhancing participants' attitudes towards and intent to teach simulated laboratories. As a slight increase in self-efficacy and intent to teach was found, we conclude that simulated laboratories can have a positive impact on student learning within the agricultural education program. We recommend other programs conduct similar workshops when introducing teachers to specific simulated laboratory experiences. Further, intent to teach also increased, suggesting the workshop may have addressed participants' perceptions of social norms regarding integrating simulated laboratories, as they conversed with one another during the workshop. Alternatively, perhaps the workshop increased participants' perceived behavioral control over integrating simulated laboratories. Both of these implications align with the theory of planned behavior, suggesting the increased intent to teach can be interpreted as an increased likelihood in a behavioral change (Ajzen, 1991).

In addition to increased self-efficacy towards and intent to teach simulated laboratories, this workshop also provided participants with both instructional materials and a professional network to assist in their progression of simulated laboratories. The labs conducted the day of the inservice are available to be check out by educators to use in their curriculum through the [University] website for free. Future research will be conducted with the participants to determine the extent to which they have incorporated simulated laboratories into their local programs and the effectiveness of the simulated laboratories within the classroom.

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The Benefits of Student-Created Plant Identification Notebooks

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The Benefits of Student-Created Plant Identification Notebooks.

Electronic resources are effective when it comes to the identification of plants in agriculture (Sabota, Beyl & Ghale, 1995; Seiler, Peterson, Taylor, & Feret, 1999, White, Beattie, and Kubek, 1990). However, many electronic resources are designed to replace instead of supplement the instructor (Jonassen, Carr, & Yueh, 1998).

The creation of study tools is a very effective way of creating knowledge and encouraging critical thinking (Leggette, Rutherford, & Dunsford, 2015). Supplementing plant identification with manuals allows for students to study identification outside of the classroom or laboratory environment when plants are not available to the student (Kirchoff, Delaney, Horton & Dellinger-Johnston, 2014).

At the University of Mount Olive, students are required to learn hundreds of plants and pests in an upper-level horticulture class. The class follows the guidelines of the NCNLA Certified Plant Professional (CPP) exam, which allows for students to earn an industry certification upon their success in the course. One of the main assignments that students in the course are required to do is an electronic or printed plant identification notebook that includes identification entries for each plant and pest present on the CPP Exam. While the assignment has been required for multiple classes, it was deemed important by the researchers to see if the student-created notebooks were effective.

Theoretical Framework

Experiential learning theory states that people learn best when they are able to have time to have an experience, reflect on the experience, and apply what they learned from the experience to develop a new experience (Kolb, 1984). The students in the plant identification course modeled experiential learning theory with their assignments. The student experience was represented when they engaged with in-person plant identification. Students demonstrated reflection when they created, added to and modified their notes. The students applied what they learned through self-teaching of the plant characteristics. The students also planned a new experience when they prepared for the next round of in-person plant identification.

Purpose and Research Question

The purpose of the study is to see whether or not it is beneficial for students to create a plant identification notebook when preparing for the CPP Exam. Therefore, the main research question for the study is "What is the benefit of a student-generated plant identification notebook?" The research question addresses AAAE Research Priority 4, Meaningful, engaged learning in all environments (Edgar, Retallick & Jones, 2016).

Methodology

A semi-structured interview was used to collect data from students enrolled in a 2017 plant identification course at the University of Mount Olive. All 24 students enrolled in the plant identification course were invited to participate in the study, of which 21 (87.5%) agreed to be interviewed for the study. The interview followed eight sub-questions determined via an *a priori* table (Kahtz, 2000; Karpicke & Blunt, 2011; Kirchoff et al., 2014; Sabota et al., 1995; Teolis, Peffly & Webster, 2007; Uno, 2009; Wilson, Miller, Bloedow, 2017).

The interviews were collected one-on-one by the researchers at times and places that were conducive to the schedules of individual participants. These interviews were conducted by the researchers who were not responsible for teaching the course, so that the students were more willing to open up and share their experiences (Seidman, 2013). The conducted qualitative interviews consisted of questions based on the plant identification notebooks. The participants were interviewed to receive feedback on their opinions of the plant identification notebooks. The

d , 2009). The codes were analyzed using a two-cycle coding method. The first cycle was structural coding, which allowed for " ontent- sed or on e tu hr se " to re te to s e ifi r ese r h question d , 2009, p. 66). The second cycle used for the code was the development of themes based upon the generated codes from the first interviews. The findings reported the main themes generated through the two-cycle coding analysis.

Findings

The creation of the plant identification notebook showed that the students developed critical thinking skills when organizing and collecting information for each plant. The plant identification notebooks also served as a reliable reference that the students could use outside of class time to review previously taught plants and to preview plants not yet taught in the class. One student m de the omment th t "It he ed ide ntify n ts that looked similar using identifying characteristics." Another student m de the st te ment th t " It wou d h ve e en etter with a physical part of the plant like a leaf, in hard copy format". A key factor in plant identification is that physical plants need to be present or available for studying characteristics that are not visible in pictures. Based on the results of this study, 13 of the 21 students used the university arboretum for practice.

Reliability of resources was an issue during the creation of the plant identification notebook. Lack of time was an issue for 18 of the interviewed students. Fourteen out of twenty-one of the students referred to the plant identification notebook when plants were not readily available, even if infrequently referenced. One student's res onse out how often they referred to the notebook when plants were not readily available was, "I didn't h ve it finished for th t ut if you h d it done it wou d've e en he fu i f done right."

Conclusions

The creation of the plant identification notebooks is an effective way for students to gain knowledge. Previous research agrees that that viewing a plant physically allows for students to remember it better (Teolis et al., 2007). When finding information for the plant identification books, the class textbook was very reliable, also some websites were useful and the information the instructor gave was very useful. Although the creation of a plant identification notebook is time consuming, it has been proven to be beneficial. The more time spent using the book as a resource, the greater chance that the individual had an increase in their identification skills. Interview responses and test results both conclude that the more time spent studying the plant identification notebook; there is a better chance at passing the state exam. This is reflected in experiential learning theory that acknowledges that the longer time spent trying to learn something, the better it will be understood (Kolb, 1984).

Implications

In a plant identification course, there should be a main focus on practicing plant identification with live plants. It has shown that incorporating a method that involves the creation of study materials by the individual can be helpful if managed correctly. When requiring a large assignment such as a plant identification notebook, it is important to have an adequate amount of time to complete the creation and set deadlines to assist students with time management. Electronic sources do not replace actual plants; live specimens must be available for viewing by the students in order to learn adequate plant identification skills. Research that focuses on time management for students completing major projects is needed. Procrastination was the main reason why some students were unsuccessful with the creation of the plant identification notebook.

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The Effect of a Teaching in a Laboratory Setting Course on Pre-Service Teacher Self-Efficacy

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The Effect of a Teaching in a Laboratory Setting Course on Pre-Service Teacher Self-Efficacy

Introduction

School-based agricultural education (SBAE) is facing a shortage of qualified agriculture teachers (Smith, Lawver, & Foster, 2018). It has been found that the self-efficacy of teachers is critical for teacher retention (Knobloch, 2001). McKim and Velez (2017) proposed that preservice teacher coursework is one of the elements that SBAE teacher self-efficacy is dependent upon. Agriculture teachers teach a variety of courses in many different settings, including, in the classroom and laboratory. The amount of hands-on experiences that preservice agriculture teachers have varies greatly (Houck & Kitchel, 2010). It is essential that we not only prepare students to teach these hands-on concepts but that we also ensure that they have the confidence to teach these skills. The purpose of this quantitative study was to determine the effects of a laboratory practices course on preservice teacher's self-efficacy when teaching in a laboratory setting. The following research objectives guided this study: 1) determine the self-efficacy levels of University of Florida pre-service teachers on agriculture knowledge and skills, student motivation, and classroom management and 2) determine the effect of a laboratory practices in teaching agricultural education course on preservice teacher's self-efficacy.

Theoretical Framework

This study utilized Bandura's (1977b) self-efficacy theory. This theory evolved from Bandura's social learning theory (Bandura, 1997a). Bandura's social learning theory, the learning can be broken down into 3 main components: 1) previous behavior, 2) the environment, and 3) the personal characteristics of the individual. Furthermore, Bandura defined self-efficacy as "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Bandura believed that behavior is altered by experiences. Specifically, Bandura outlines four experiences, including; mastery, vicarious, social persuasion, and physiological and emotional states.

Methods

The accessible population for this study consisted of students (n = 15) enrolled in a laboratory practices in teaching agricultural education course in the spring of 2018. The instrument used in this study was adapted from the teachers' sense of efficacy scale (Tschannen-Moran & Woolfolk, 2001). This instrument consisted of 38 questions. This instrument was broken down into two main sections that consisted of (1) agricultural knowledge and skills and (2) classroom management and student motivation. The construct validity of this instrument was determined by a review from industry professionals that consisted of faculty members and graduate students in agricultural education at the University of Florida. This study consisted of a pre-test and post-test of this instrument. The pre-test was given on the first day of the course, and the post-test was given on the last day of the course. Data were analyzed using descriptive statistics to observe frequencies.

Results

Due to page limitations, not all of the 38 statements are included until results are presented. Table 1presents results for student self-efficacy levels of classroom management and student motivation. Table 2 presents student self-efficacy levels of agricultural knowledge and skills.

Table 1

Self-efficacy of classroom management and student motivation (N = 15)

Statement	SD %	D %	N %	A %	SA %
How much can you do to monitor safety practices on a swine farm?	13.3 0	6.7 0	46.7 6.7	20.0 40.0	13.3 53.3
How much can you do to control disruptive behavior when working in a laboratory setting?	6.7 0	6.7 6.7	33.3 6.7	40.0 33.3	13.3 53.3
How much can you do to motivate students to become good welders?	46.7 0	20.0 0	33.3 40.0	0 46.7	0 13.3
How well can you ensure safety when a student is using the school's tractor?	33.3 0	13.3 6.7	26.7 13.3	20.0 26.7	6.7 53.3
How much can you gauge a student's comprehension of biotechnology practices that have been taught?	15.9 0	35.9 6.7	20 20.0	28.2 40.0	0 33.3

Note. N = nothing, V = very little, S = some influence, Q = quite a bit, G = a great deal. The first row shows pre-test scores and the second row shows the post-test scores.

Table 2

Self-efficacy of agricultural knowledge and skills (N = 15)

Statement	SD %	D %	N %	A %	SA %
I am knowledgeable about how to clip needle teeth on swine.	73.3 0	13.3 0	6.7 0	6.7 40.0	0 60.0
I can connect the science of electricity with the practical application.	60.0 0	20.0 0	6.7 26.7	6.7 40.0	6.7 33.3
I can apply biotechnology concepts to agricultural practices.	33.3 0	20.0 0	33.3 0	13.3 40.0	0 40.0
I am knowledgeable about basic electrical skills.	73.3 0	13.3 6.7	6.7 13.3	6.7 46.7	0 33.3
I can effectively operate a tractor.	40.0 0	13.3 6.7	13.3 20.0	26.7 40.0	6.7 33.3

Note. SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree. The first row shows pre-test scores and the second row shows the post-test scores.

Conclusions & Recommendations

The purpose of this study was to access self-efficacy levels of students in a laboratory practices in agricultural education course. The 15 students in this course began with relatively low self-efficacy scores. Self-efficacy scores in each of the areas increased. If agriculture teacher educators are going to prepare confident agriculture teachers, self-efficacy needs to be considered. With agricultural education gaining preservice teachers with varying degrees of hands-on agricultural training, increasing self-efficacy in these hands-on activities is essential. This course achieved the goal of increasing self-efficacy of preservice agriculture teachers. These teachers will be more likely to teach skills-based curriculum having higher self-efficacy scores. This will create agriculture teachers who feel confident in teaching in a laboratory setting. Recommendations for further research include accessing self-efficacy of preservice agriculture teachers in other courses and following up with the individuals when they begin to teach agriculture to see if their self-efficacy levels have continued to increase.

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The Role of Living-Learning Communities and University Agriculture Students' Retention

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Introduction

Living-learning communities are designed to increase student involvement and interactions with faculty and peers within their degree program while being housed in college residential halls (Pike, 1999; Stassen, 2003; Tinto, 1998). They provide opportunities that promote involvement and incorporate relevant educational components that extend beyond the classroom (Tinto, 1998; Zhao & Kuh, 2004). Research on living-learning communities has shown they have a positive effect on numerous student outcomes such as (a) persistence, (b) personal development, (c) intellectual development, (d) adjustment to college, and (e) independence (Inkelas et al., 2006; Stassen, 2003; Tinto, 1999; Zhao & Kuh, 2004). If university students are not able to integrate social and academic learning during their college experience, they are less likely to complete their degree (Tinto, 1993, 1998). Therefore, students who regularly participate in varied activities are more likely to develop connections with similar peers, which leads to improved student retention, personal development, and academic success (Zhao & Kuh, 2004). Institutions can improve students' self-efficacy and retention by facilitating student involvement through living-learning communities and freshman seminars (Tinto, 1999).

Theoretical/Conceptual Framework

Bandura (1997) explained that self-efficacy refers to an individual's self-perceived capability to learn or perform actions at a predesignated level. Social self-efficacy, more specifically, is defined by Anderson and Betz (2001) as "confidence in one's ability to engage in the social interactional tasks necessary to initiate and maintain interpersonal relationships in social life and career activities"(p. 101). According to researchers, higher levels of social self-efficacy can lead to greater feelings of social inclusiveness which can have a positive impact on student retention (see Figure 1) (Tinto, 1993). In the current study we examined the role of social inclusiveness, as facilitated by a living-learning community, on Louisiana State University agriculture students' retention.

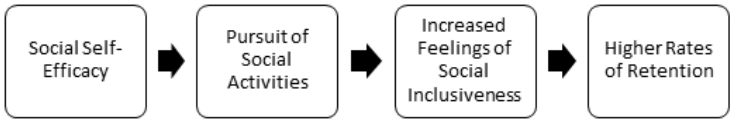

Figure 1. *Social Self-Efficacy Concept Model*

Methodology

The target population of this study consisted of all Louisiana State University students (N-237) enrolled in a one-credit introductory agriculture course during the fall 2017 semester. At the end of semester, data were collected via Qualtrics using a web-based instrument. A total of 211 students completed the instrument, resulting in an 89% response rate. Fan's and Mak's (1998) social-efficacy scale was used to measure four distinct constructs: (1) social difficulties, (2) social confidence, (3) sharing interests, and (4) friendship initiatives. The resulting instrument contained 20-items, and potential response categoties were arranged on a 5-point Likert-type scale. Reverse coding was performed on negatively worded items so that high agreement indicated a higher level of self-efficacy. Each of the constructs held satisfactory ($\alpha >$ .70) post-hoc reliability coefficients, and face and content validity were determined by one agricultural education faculty member and four agricultural education graduate assistants for the course. Data were analyzed utilizing SPSS version 26 for Macintosh. Descriptive statistics,

including means, frequencies, and percentages were utilized to address the role of social self-efficacy on retention.

Results

This study aimed to describe the retention of students to the College of Agriculture (COA) based on their residential status (i.e., on campus-agricultural residence college (ARC), on campus-not ARC, and off campus) (see Table 1). Overall, the majority of students were retained to Louisiana State University (*f* = 186; 88.1%). Also, the majority of students who started their freshman year in the COA were retained the following year (*f* = 137; 64.9%). In regard to residential status and retention, the majority of students who were on campus in ARC were retained to COA (*f* = 65; 69.1%) and to Louisiana State University (*f* = 83; 88.3%). Also, the majority of students who were housed on campus not in ARC were retained to COA (*f* = 35; 61.4%) and 52 (91.2%) were retained to Louisiana State University. Finally, the majority of students who lived off campus were retained to COA (*f* = 37; 67.3%) and retained to Louisiana State University (*f* = 51; 92.7%).

Table 1
AGRI 1001 Retention based on Residential Status Demographics

Residential Status	*Retained to COA*				*Retained to LSU*			
	Yes		*No*		*Yes*		*No*	
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*
On Campus-ARC	65	69.1	29	30.9	83	88.3	11	11.7
On Campus-Not ARC	35	61.4	22	38.6	52	91.2	5	8.8
Off Campus	37	67.3	18	32.7	51	92.7	4	7.3
Total	137	64.9	69	32.7	186	88.1	20	9.4

**Note: Not all percentages equal 100 due to missing data.*

Conclusions & Recommendations

According to Tinto (1993), students engaging in a university living-learning community program are often provided with numerous opportunities that can foster a greater sense social self-efficacy, leading to increased subsequent retention levels. However, our results provided some new insights in the context of agriculture. For example, 69.1% of students engaged in living-learning communities, or ARC, were retained to the COA while 88.3% were retained to the university itself. Compared to non-ARC students, of which 61.4% and 92.7% were respectively retained, these results demonstrate little differences between the two groups. Although a greater percentage of non-arc students were retained to Louisiana State University, it should be noted that a slightly larger percentage of ARC students were retained to the COA. This may potentially highlight the ability of college-specific residential colleges to promote continued interest in the field among its students. Further retention research should address residential programs' effect on student retention in regards to retention theory. Future qualitative inquiry on how living-learning communities shape student experiences and learning is also warranted.

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Research Poster

Victory Gardens: Significance to 4-H, Cooperative Extension, and Agricultural Education

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Victory Gardens: Significance to 4-H, Cooperative Extension, and Agricultural Education

Introduction

"Food Will Win the War and Write the Peace" (Schaub, 1914b). During countless wars of the past, our nation and others have faced food insecurity. Because of the demand for war industry operations, the supply of essential staple food items in households significantly decreased leaving the government to ration foods such as sugar, milk, cheese, eggs, coffee, meat, and canned goods (Reinhardt, n.d.) and encouraged citizens to grow War Gardens and thus the term Victory Gardens was coined (Miller, 2003).

Conceptual Framework

This study was conducted from a historical perspective. Historical analysis brings forth the importance of an era in history and signifies events from which we can learn from today (Rury, 2006) by systematically and objectively identifying, evaluating, and interpreting evidence from which people can learn about the past (Ary, Jacobs, & Razavieh, 2002). The purpose of this study was to document the collaboration victory gardens brought to 4-H, Cooperative Extension, and Agriculture Education. Specific objectives of the study were:

1. Describe how World War I and World War II food shortages and initiatives impacted 4-H members, Cooperative Extension, and Agricultural Education.
2. Identify the contributions that 4-H members, Cooperative Extension Agents, and Agriculture Educators had on the success of victory gardens.

Methodology

Historical research methods were used to guide the objectives of this study. The researcher used primary sources of information whenever possible (Ary, Jacobs, & Razavieh, 2002). These primary sources included documents such as diaries, manuscripts, and data collected by state and federal agencies related to agricultural education or historical information for the United States. The researcher also used secondary sources that included data from published newspaper articles and information provided by institutions in the agriculture education and cooperative extension fields. Secondary sources were prepared for comparison against primary sources only to understand their accuracy. Internal criticism strictly looked at accuracy while external criticism strictly looked for authenticity in all research done for this project. The researcher accessed a majority of the historical publications and documents through the NC State University Special Collections Research Center (NC State University Libraries, 2018). RESEARCH PRIORITY 6: Vibrant, Resilient Communities as defined in the AAAE Research Agenda is applicable (Graham, Arnold & Jayaratne, 2016). This research priority certainly pertains to resilient community volunteers of all ages engaged in a common effort to support and sustain each other and their homeland.

Findings

Weeks before the United States entered World War I, Charles Lathrop Pack organized the National War Garden Commission in March of 1917 because the United States was experiencing the burden of feeding millions of starving Europeans who were on the battlefield (Schumm, 2014a). The purpose of the Commission was to encourage Americans to contribute to the war effort by planting, fertilizing, harvesting, and storing their own fruits and vegetables in order for more food to be exported to our allies (Schumm, 2014a). More than 15,000 children joined clubs organized by the Extension Service and became an army of food producers while "gardens

sprang up everywhere as if by magic - in the backyards, by the railroad tracks, in the cotton patches and in the new ground" (Kilgore, 1917). In 1914, a procedure was written for 4-H Victory Garden Programs instructing every club in North Carolina to participate (Schaub, 1914b).

Because our nation was experiencing exigencies during World War I, the government began looking into enlisting children into the army, not to be in battle, but to fight the war against food shortages. "Every boy and girl should be a producer. The growing of plants and animals should become an integral part of the school program. Such is the aim of the U.S. School Garden Army" (Hayden-Smith, 2006, p. 2). By July of 1918, 1,500,000 boys and girls responded to President Woodrow Wilson and enlisted in the United States School Garden Army. 20,000 acres were converted to gardens and 50,000 teachers were involved (Francis, 1919). During this increase in agriculturally focused school gardens, extension agents were in high demand and between June of 1917 and 1918, the number of extension agents in the U.S. went from 2,200 to 6,000 and the USDA requested their time be spent instructing teachers and students to grow gardens (Hayden-Smith, 2006; Francis 1919). During World War II in 1942, 4-H began a few new programs to entice farm boys or girls with a competition to win $1- $250 through the "Food for Victory" program which offered war bonds or stamps for participating in the "Food for Freedom" extension program (Historical State Timelines, n.d.).

Conclusions

The war effort increased the visibility and underscored a purpose for agriculture education. Specifically, the need to educate people to help feed our nation. Professors authored multiple books which became readily available for the use of instructing students about their gardens. America stepped up by participating in the war effort and victory gardens cultivated a new sense of patriotism in citizens that united them like never before. Just like agriculture education today focuses on producing well-rounded and informed citizens, the school gardens did as well. "1.5 million children were given something to do last summer which helped carry the burden of their country in the struggle for freedom, something that helped build character and something that appealed to and developed their patriotism" (Francis, 1919, p. 3).

Implications/Recommendations/Impact on Profession

The public's newfound interest in "fresh and local" has sparked a huge fire within consumers to be nearest to what they purchase at a market or grocery chain (Edin & Shaefer 2016). This new wave of foodies gives Extension and 4-H a great avenue to break into unreached communities and start helping consumers understand the basics of growing and preserving food.

Each agriculture education course in North Carolina is taught beginning with the history of the FFA and the researcher suggests that victory gardens and the hard work that FFA members contributed to "winning the war" be emphasized in linkage with the "living to serve" character showcased in the FFA motto (Wolf & Connors, 2009; National FFA Organization, 2018). To further this study, the researcher suggests that possibilities of "current day victory gardens" be explored in an effort to supplement governmental food programs such as SNAP, WIC, and EBT (Edin & Shaefer, 2016). The researcher suggests informal and formal agriculture educators could encourage students to engage in present-day victory gardens as an innovative way to emerge solutions to agricultural issues, such as a "victory garden for bees" (Weidenhammer, 2016).

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What Effect Does an Encouraging Email Have on Motivating Students for a Course before the Semester Starts?

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What Effect Does an Encouraging Email Have on Motivating Students for a Course before the Semester Starts?

Introduction

Since Chickering and Gamson (1987) published the seven principles for good practice in undergraduate education, faculty have been encouraged to promote communication between students and faculty. Communication is essential for building rapport with students (Granitz, Koernig, & Harich, 2009). Tickle-Degnan and Rosenthal (1990) espoused that rapport is established through a three-component model: 1) attentiveness – a mutual interst in what another person says or does; 2) positivity – an exhibition of friendliness, kindness, and genuine care between one person and another; and 3) coordination – creating a harmonious, fair, and balanced relationship between what people are asked to do. Faranda and Clarke (2004) stated that faculty should establish rapport with their students by being emphathetic to their needs and being approachable and accessible to them. Faculty also should treat students with respect and dignity (Granitz et al., 2009). When done, both faculty and students can benefit by having better overall relationships with enhanced communications that lead to trust (Granitz et al., 2009).

A positive relationship between student/professor rapport and students' expectancy for success and values has been found in college of agriculture courses (Estepp & Roberts, 2013). College faculty build rapport with their students in various ways – both verbal and nonverbal – to motivate students for success in their classrooms (Wilson, Stadler, Scwhartz, & Goff, 2009). For female instructors, a personal handshake on day one of class motivated students to perform (Wilson et al., 2009). However, the same study showed that a handshake from a male instructor was a demotivator to student success. Because the literature on personal touch is contradictory, other modes of rapport building should be investigated to determine the effect, if any, they may have on students' motivation to succeed.

Theoretical Framework and Purpose of the Study

This study was undergirded using the expectancy-value theory (Schunk, Pintrich, & Meece, 2008). People's expectations and values can affect why "they might engage in a task" (Schunk et al., 2008, p. 44). If people believe they can succeed at a task, they are more motivated to participate (Schunk et al., 2008). Faculty can motivate students through both verbal and non-verbal encouragement (Wilson et al., 2009). Therefore, the purpose of this study was to determine the effect of pre-course communication (i.e., a personalized email) on students' motivation for courses in a [College of Agriculture]. The following question was investigated: Does motivation for a course differ between students who receive a personalized email from the instructor and those who do not?

Methods

A quasi-experimental design (Privitera, 2017) guided this study and included students enrolled in the agricultural college's lower division plant and soil science courses and upper division oral and written communications courses ($N = 630$). The courses selected serve a variety of majors in the college and have diverse student enrollment representative of the college's undergraduate population. One-half of the students from each course were randomly selected to receive an email from their course instructor three days before the first class session ($n = 316$). A template welcome email providing tips for success was addressed individually for each randomly selected

student and distributed by the course instructor. The remaining students (n = 314) did not receive email communication from their instructor before the first day of class.

Instrumentation

Keller's (2006) *Course Interest Survey* (CIS) was adapted for this study. The CIS was developed to measure student's motivation across four constructs of the ARCS model of motivation (Keller, 1984) through a series of 34 Likert-type questions with a response scale ranging from 1 to 5 (Keller, 2006). Internal consistency of the instrument, based on Cronbach's alpha, was .95, with each of the four subscales maintaining a Cronbach's alpha between .81 and .88 (Keller, 2006). Of the four subscales (Attention, Relevance, Confidence, Satisfaction), items related to Satisfaction were removed from the instrument (questions 7, 12, 14, 16, 18, 19, 31, 32, 33, and 34) since students had no prior experience with the course before participation in the study. Additional questions were removed and/or wording slightly edited to fit the context of the study, resulting in a total of 18 questions measuring the Attention, Relevance, and Confidence subscales.

Data Collection and Analysis

Course instructors administered the CIS to all students during the last 10 minutes of the first class meeting day of the Fall semester. A total of 608 students participated in the study. Data were inputted and calculated using SPSS® v.23. After confirming assumptions for homogeneity and normality, a one-way analysis of variance (ANOVA) was chosen to determine if statistically significant differences in motivation existed between the student groups, with statistical significance determined *a priori* (α = .05).

Results

Results from the one-way ANOVA indicated group means were similar among the student groups for course motivation ($F(1, 606) = 0.381$, $p > .05$); therefore, the null hypothesis was retained. According to the Omega squared measure of association, less than 1% ($\omega^2 = 0.001$) of the variability in course motivation could be attributed to whether a student received the pre-course email from the instructor. Similarly, the reported effect size was negligible ($f = 0.03$), confirming the group means did not differ significantly. As a result of the study's low power (0.11), the probability of conducting a Type II error, or concluding the pre-course email intervention did not have an effect on the student course motivation, was 89%. Because any difference between means of the student groups were not statistically significant, a post-hoc analysis was not used to explore and compare the means of course motivation of the two groups.

Conclusions/Implications/Recommendations

An email from the instructor prior to the beginning of class did not have an effect on students' motivation for the course. The College of Agricultural Sciences and Natural Resources at Oklahoma State University is noted for its devotion to teaching. Numerous instructors advise students, have an open-door policy, and participate in hosting students on campus via recruitment events. It is possible that students had already met their instructor prior to receiving the email and that it was not the first point of contact. As such, the results of this study may have been skewed. Future research should assess how emails can be used to encourage and motivate student success throughout the semester.

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What Factors Influence College Students' Proficiency for Career Readiness?

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Introduction

Preparation for career entry has become a major focus on college graduates (Stone & Lewis, 2012) and preparation of independent minded individuals that are academically, technically and socially ready to enter a career where they can solve problems should be the nexus of public education in America (Wardlow & Osborne, 2010). The expectations for students to excel in the workforce are high and demanding (Carnevale, Smith, & Melton, 2011). "Is it possible that colleges and universities are failing in their role to prepare graduates for the expectations of the workforce?" (Robinson, Garton & Vaughn, 2007, p.19). If so, how do we better understand the needs of college students when many are concerned they are exiting high school not fully prepared for the demands of college or a career? (Stone & Lewis, 2012). The purpose of this research was to explore the factors that influence college students' perceptions of career readiness by determining self-reported proficiency levels on select knowledge, skills and dispositions, aligning with priority three of the National Research Agenda of the American Association for Agricultural Education which calls for a "Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century" (Stripling & Ricketts, 2016).

Theoretical/Conceptual Framework

The Conceptual Model for the Study of Student Readiness in the 21st Century posits a systems approach is required to prepare students to be both college and career ready (DiBenedetto & Myers, 2016). Students develop learning, career and life skills by acquiring and interrelating a variety of knowledge, skills and dispositions that help them to become life ready individuals. Life ready individuals are one's that are prepared for work and ready to be responsible citizens in their homes, schools and communities. The guiding theory and framework that was utilized to depict the conceptual model was embedded by the underpinnings of Bandura's Social Cognitive Theory (SCT) (Bandura, 1986) and Bronfenbrenner's Bioecological Theory of Human Development (BBTHD) (Bronfenbrenner, 2005). Jointly SCT and BBTHD were intensely studied and theorized to create the Conceptual Model for the Study of Student Readiness in the 21st Century (DiBenedetto & Myers, 2016), which served as the theoretical and conceptual framework for this research.

Methodology

The dataset for this study was obtained from an online survey instrument distributed to graduate and undergraduate students in the Agricultural Sciences Department at Clemson University. The survey instrument consisted of nine career readiness constructs including: learning skills, life skills, career skills, social skills, interdisciplinary topics, knowledge competencies, incidental learning skills, dispositions, and experiences. In an effort to determine student's perceived level of proficiency for each skill, a variety of knowledge, skills, and dispositions were included for each construct developed from the Conceptual Model for the Study of Student Readiness in the 21st Century (DiBenedetto & Myers, 2016). The survey instrument was pilot tested with alumni, faculty and staff of the department to determine face and content validity, as well as improve the clarity of the questions. The post-hoc reliability coefficient was $\alpha = .91$. The population frame was provided by the department's academic coordinator and included an accurate and up to date list of students enrolled in courses in the department during the fall of 2017. In addition to emailing the students the survey, faculty in the department were encouraged to remind students in their courses about the research. The

population of interest included 370 students with a final sample of 163 survey participants, which translated to an effective response rate of 44%.

Respondents' belief about their proficiency in the different constructs was evaluated on a four point Likert-scale rating ranging from no proficiency to high proficiency. Considering the ordered nature of the responses (from low to high proficiency) an order probit formulation was utilized to estimate relationships between the ordinal dependent variables (life skills, career dispositions, learning skills etc.) and a set of independent variables.

Results/ Findings

The majority of the survey respondents were male (62.7%), between the ages of 17-20 (56.8%), and Caucasian (95.7 %). This result is consistent with the overall gender and race/ethnic distribution in the department. The majority of the survey participants were pursuing a Bachelor's degree (90.7 %). Approximately one third of the students represented each of the three majors in the department (Agribusiness, 31.4%, Agricultural Education 28.0%, and Agricultural Mechanization, 23.5%). Over half (52%) of the students transferred to Clemson University. The types of high schools students attended were public (76.9%), private (18.8 %) and charter (4.3%). When asked to report advanced placement (AP) courses taken in high school 59.3% reported taking at least one. An overwhelming majority of respondents reported involvement in college campus organizations (87.3%) and were mostly represented by participation in student clubs (66.4%). The findings of the ordered probit formulation highlight that students who reported taking AP courses are more likely to consider themselves highly proficient in learning skills ($p = .004$), life skills ($p = .000$), and incidental learning skills ($p = .005$). Second, transfer students were more likely to believe that they are proficient in life skills, compared to students who attended Clemson University after high school. The same was true for students majoring in Agricultural Education, compared to students majoring in Agricultural Mechanization and Business or Agribusiness. Third, transfer students, as well as students who reported involvement in college campus organizations were more likely to regard themselves as proficient in terms of interdisciplinary skills, compared to students who are not actively involved in club activities, or joined the Clemson University after high school. Lastly, students who attended private school were more likely to consider themselves as proficient in experiences.

Conclusions and Recommendations

It was interesting to discover that transfer students in the Agricultural Sciences department at Clemson University consistently reported a higher proficiency in four of the nine constructs of interest related to the knowledge, skills and dispositions identified by the Conceptual Model for the Study of Student Readiness in the 21st Century (DiBenedetto & Myers, 2016). This finding may be related to the fact that students who transfer from a technical college to a university have been provided a variety of coursework that may be more focused on career preparedness rather than academic competency. Additionally, students who reported taking AP courses in high school revealed a higher proficiency in three of the nine constructs. AP courses may assist students with problem solving and becoming more independent learners as they interact with the course content where higher stakes are involved. Students who attended private school, those majoring in agricultural education and those involved in college campus organizations also reported higher proficiency for career preparedness, suggesting involvement in extracurricular activities provided college students with opportunities to enhance their career preparedness in a variety of areas. Further investigation into the factors that contribute to career

preparedness within the conceptual model should be explored. We also recommend this research be extended to students in the College of Agriculture at Clemson University and to others across the nation where similar student bodies exist.

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