AAAE Poster Session Proceedings

Oklahoma City, Oklahoma – February 5-7, 2023

Acknowledgements:

Reviewers:

2023 Southern Region AAAE Poster Session Accepted Submissions

Innovative Idea Five Moons 4, Sunday, February 5, 2023, 2:45-4 pm

A Career Pathways Web Portal for Student Success	Joseph L. Donaldson, Gabrielle Whorley, & Misty D. Lambert	North Carolina State University
A Proposed Model for an Integrated Three-Component Model of Elementary Agricultural Education	Jason Peake	University of Georgia
A Proposed Model for Providing Elementary Agriculture Teachers with Ongoing Professional Development	Jade Frederickson	University of Georgia
Building Community for Cooperating Teachers	Heather Nesbitt, Dr. Debra Barry	University of Florida
Building Professional Collaboration and Identity Through Pre-service Agricultural Education Teacher Professional Development	Trent Wells; Christopher M. Estepp	Southern Arkansas University; University of Arkansas
Caring Cards: A Peer-to-Peer Mental Health Intervention in Agricultural Communities	Katrina A. Clontz, Carolyn A. Oldham, Stacy K. Vincent, & Kelly J. McFarland	University of Kentucky
Designing for Success: Instructional Design to Support Online Instruction in Agricultural Education	Katlyn Foy, Wendy J. Warner, Travis D. Park, Joy E. Morgan, Bethanne Winzeler, Arlene Mendoza-Moran, Kerri Brown-Parker, Christine Cranford	North Carolina State University
Developing Online Pedagogical Content Knowledge Learning Opportunities for Elementary Agriculture Teachers	Jade Frederickson	University of Georgia
Engaging and Educating Agricultural Educators through In-State Study Experiences	Nikki Miller, Joy Morgan, Travis Park, Wendy Warner, Misty Lambert	North Carolina State University
Escaping a Lecture: Utilizing a Digital Escape Room to Introduce the SAE for All Model	Jillian C. Ford, Misty D. Lambert	North Carolina State University
Facilitating an Early Field Experience via a Regional Career and Technical Education Outreach Event for Underrepresented Students	Trent Wells	Southern Arkansas University
Increasing Intercultural Competence Through Food	Elizabeth Abati & Casandra Cox	University of Arkansas

Innovative Idea Five Moons 4, Sunday, February 5, 2023, 2:45-4 pm

Integrating Agriscience: Using Hands-on Teaching to Develop Hands-on Teachers	Jennifer Brown and Kristin Stair	Louisiana State University
MOM Groups - Creating Social Presence in an Online Agricultural Leadership Course	Ainsley M. Burns, Summer F. Odom, Jonan P. Donaldson	Texas A&M
Multilevel Modeling: Foundations and Opportunities in Agricultural Communications, Education, and Extension	Jean A. Parrella, Peng Lu, Rafael Quijada Landaverde, Holli R. Leggette, Matt Baker	Texas A&M University
Preservice Teacher's Use of Professional Learning Communities During Their Student Teaching Experience	Jason Dossett, Heather Nesbitt, R. G. (Tre) Easterly	University of Florida
Staying Informed: Using Student Reflections As Teaching Tools	Casandra Cox, Daniela Medina, Elizabeth Berner	University of Arkansas
The Compost Learning Laboratory: A Laboratory for Experiential Learning and Informal Teaching of Solid Waste Management to Adult Learners.	Joshua Campbell	Oklahoma State University
The Growth in Leadership Skills and Development of Fellowship through Literacy.	Rachelle Andreatta, Joy Morgan, Wendy Warner, Travis Park, Rachel Vann, and Brent Jennings	North Carolina State University
The Use Challenge Coins to Address Teenage Mental Health Among Secondary Agriculture Youth	Kelly J. McFarland, Stacy K. Vincent, Katrina A. Clontz, & Dale Dobson	University of Kentucky
Tools for Another Time: Using a Weekend Course to Build Teacher Efficacy in Training Career Development Events in School-Based Agricultural Education	Tyler J. Price and Jon W. Ramsey	Oklahoma State University
Using a Cognitive Apprenticeship Approach to Prepare Successful Grant Writers	Holli R. Leggette, Dara M. Wald, Jean A. Parrella, Peng Lu, Miguel Diaz Manrique	Texas A&M University
Who Wants to Bring Agriculture into Their Classrooms? An Online Professional Development Program	Josey M. Webb, Carley C. Morrison, Stephanie M. Lemley, Shannon K. Allen, Allyson K. Moore	Mississippi State University

Research Five Moons 4, Monday, February 6, 2023, 3:15-4:30 pm

A Systemic Review of Queer Representation and Critical Paradigms Within the Journal of Agricultural Education	Eric M. Moser, Stacy K. Vincent	University of Kentucky
Advancing Agriculture: The Impact of an American Fellowship Program on Ghanaian Teachers	Jessica R. Spence, Meikah Dado, Dr. Jack Elliot	Virginia Tech, Texas A&M University
An Overview of Mental Health Research in Agricultural Education	Carrie N. Baker, Sarah A. Bush, Rafael Landaverde	University of Florida, University of Florida, Texas A&M University
Analyzing Demographic Data to Support and Promote Livestock Science Camp Participation	Madison Adams, Carrie Pickworth, Joy Morgan	North Carolina State University
Assessing Preservice SBAE Teacher Needs for Working with English Language Learners	Maggie Salem & Will Doss	Texas A&M University-Commerce & University of Arkansas
"Blazing the Trail" for the Future: BIPOC Students' Experiences with Colleges of Agriculture	Logan G. Moss, Christopher M. Estepp	University of Arkansas
Bumpers College Of Agricultural, Food And Life Sciences Student Perceptions Of Career Preparedness	Jessica Wesson, Samantha Jones, Casandra K. Cox, K. Jill Rucker, & Jefferson D. Miller	University of Arkansas
Content Taught in Agricultural Mechanics Courses, 1980 to 2021: A Survey of Nine 1862 Land-Grant Universities	Kristopher Robert Lee Rankin III & M. Craig Edwards	Oklahoma State University
Defining the Employability Skills of Agricultural Educators: A Quantitative Look into the Confidence Levels of Agricultural Educators on Their Personal Employability Skills	William Norris and Emily Sampson	New Mexico State University
Describing Agricultural Communication Content Training for SBAE Teachers	Tyler J. Price, Aaron J. Giorgi, and Quisto Settle	Oklahoma State University and West Virginia University
Determining The Professional Development Needs Of School Based Agricultural Education Teachers In Oklahoma	Kayla Marsh, Kristopher R. L. Rankin III, Christopher J. Eck, and Nathan A. Smith	Oklahoma State University

Research Five Moons 4, Monday, February 6, 2023, 3:15-4:30 pm

Evaluating Long-Term Outcomes of an Agriculture and Natural Resources Leadership Development Program	Rachel Biderman, Laura Greenhaw	University of Florida
Evaluating Psychometric Properties to Advance Agricultural Education Scholarship	Robert Strong, James Lindner, Clare Hancock, Karissa Palmer	Texas A&M University; Auburn University
Examining if the NSF INCLUDES Aspire Alliance Teaching Mentorship Promotes Ethnic Minority Faculty Mentees' Community College Teaching Efficacy, Career Confidence, and Skill Utilization	Millicent Oyugi; Alexa Lamm; Elizabeth Litzler & Jana Foxe	University of Georgia, University of Georgia, University of Washington & University of Washington
Examining the Relationships Between Self-efficacy and Information Sources Among Texas Agriscience Teachers	Millicent, A. Oyugi; Catherine, E. Dobbins; Alexa, J. Lamm	University of Georgia
Food Waste Behaviors of College Students	Kacy Wright, Donna Graham, Donald Johnson, George Wardlow	University of Arkansas
Parental Perceptions of the Equine-Assisted Therapy Program in Mississippi	Ashlyn Kiker, Kirk Swortzel, Donna Peterson, Marina Denny	Mississippi State University
Personal Agricultural Literacy: Auburn University Students' Label Identification and Response	Clare Hancock, James Lindner	Auburn University
Rewriting the Rural Narrative: A Media Analysis and Community-based Comparison	Anthony C. Caruso, Lauren Lewis Cline, and Audrey E. H. King	Oklahoma State University
School-Based Agricultural Education Teacher Aspirants Interest in CASE Curriculum Training to Support Early Career Success	Christopher J. Eck, Kristopher Rankin III, Kayla N. Marsh	Oklahoma State University
Science Communication Training Workshop for College of Agriculture Master's Students	Amy Wampler, Mason Martin, & Quisto Settle	Oklahoma State University
Social Network Analysis of an Agricultural Leadership Program	Laura L. Greenhaw & Matthew Gold	University of Florida
Statistical Power in the Journal of Agricultural Education, 2012 - 2022	Henry Akwah, Christopher M. Estepp, Donald M. Johnson	University of Arkansas

Research Five Moons 4, Monday, February 6, 2023, 3:15-4:30 pm

Teacher Confidence in Instructional Methods	Hiliary Viguet, Will Doss, John Rayfield	University of Arkansas, Texas Tech University
The Product is in the Training: Describing the Deficiencies in Agricultural Teacher Preparation Programs as Reported by Agricultural Educators	William Norris	New Mexico State University
The Struggle is Real: Identifying Prejudice and Discrimination Perceptions	Casandra Cox, Elizabeth Abati, K. Jill Rucker, & Hanna Estes	University of Arkansas
The Teaching Techniques of Alabama Agricultural Science Educators	Garrett T. Hancock, Clare Hancock, Jason D. McKibben	Auburn
Training The Trainers: Effects Of Stem-based Professional Development Training For Sbae Professionals In Louisiana	Jennifer Brown, Abigail Greer, Kristin Stair, Richie Roberts, K. S. U. (Jay) Jayaratne	Louisiana State University, North Carolina State University
"Walkin' on Eggshells": Black Doctoral Women and Gendered Racial Microaggressions in Agricultural and Life Science Disciplines	Torrie Cropps	The University of Texas at Dallas
We Speak for the Corn: An Analysis of organizational use of the "corn kid" meme	Adriana Hodges, Elizabeth Parks, Emma Richwine, Whitney Sangster, & Austin Moore	Abraham Baldwin Agricultural College
Who Will Hear Me? The Study of a Migrant Worker Turned AgricultureTeacher	Rigo Chaparro, Carla Jagger	University of Florida

A Career Pathways Web Portal for Student Success

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A Career Pathways Web Portal for Student Success

Introduction

Career development is an important topic for undergraduate education in the food and agricultural sciences, and career development is key to addressing the shortage of baccalaureate graduates for the nation's projected agricultural career opportunities (Goecker et al., 2015). A number of initiatives, including undergraduate research (Hamilton et al., 2016), major-specific advising centers (Trivedi et al., 2021), experiential learning and study abroad (Jean-Philippe et al., 2020), and career preparation courses (Fike, 2019) are aimed at helping agricultural undergraduates to secure careers in their field. These initiatives underscore the need for academic departments to help students connect with varied career information and experiences. At North Carolina State University (NC State), we developed a dynamic *Career Pathways* web portal to foster career development among current and potential agricultural undergraduates. Web portals are highly structured web pages that provide users with organized content about a distinctive subject. An open format characterizes web portals whereby users see all of their options. Research has demonstrated that web portals engage users in searching and using concordant information to a greater extent than wide-open search engines (Edgerly et al., 2014). The web portal provides agricultural students a convenient place for career exploration and engagement.

How it Works

The *Career Pathways* web portal highlights varied career opportunities, academic and career development programs, and helpful publications for obtaining and advancing in food and agricultural careers (Whorley et al., 2022). The web portal's content, inclusive of NC State's academic, research, and outreach missions, is presented via a career matrix, blog posts, publications, and programs.

- Career Matrix: We developed an online career matrix to engage students with agricultural baccalaureate programs and agricultural careers. The online matrix aligns three primary sources of online information: (a) Holland's (1997) six occupational themes (Realistic, Investigating, Artistic, Social, Enterprising, and Conventional); (b) O*NET occupations specific to food and agricultural sciences; and (c) academic programs at NC State's College of Agriculture and Life Sciences. O*NET (National Center for O*NET Development, 2022) is a free database that contains occupational information, including skills, work activities, required credentials, and more for approximately 1,000 jobs in the United States. Strong Interest Inventory® is an assessment based on Holland's six occupational themes, illuminating students' specific interests for work, leisure, and learning; personal work preferences (such as working alone or with others); and career opportunities (Donnay et al. 2005). Undergraduates may complete the Strong Interest Inventory® to understand themselves and build career management skills. Additionally, the matrix provides sufficient background information to use successfully without the formal Strong Interest Inventory®. Students review the themes to understand work preferences while discovering academic pathways in the College of Agriculture and Life Sciences and their alignment to various O*NET careers (Whorley et al., 2022).

- Blog Posts: To inform students about the abundant food and agricultural careers, we share monthly blog posts. Our blog posts highlight careers of recent Agricultural Science graduates, career development opportunities, and internship programs. One of our most popular blog posts is titled "USDA Reports a High Demand in Jobs for Agricultural Graduates". Likewise, the next most popular blog post explains the increased agricultural salaries delineated in the recent National Ag Graduates Salary Survey. Both blog posts magnify research about favorable employment opportunities for agricultural graduates.

- Publications: The *Career Pathways* web portal spotlights current publications related to career exploration and professional development. Currently, the web portal features professional development tools for Extension professionals.

- Programs: The *Career Pathways* web portal serves as a platform for new career development programs in our department. Currently, the web portal presents the Career Pathways in Agriculture for Community College Students (Career PACCS). Community college students use the website to apply for the Career PACCS program and explore the website's varied career resources. The website provides an important entry-point for community college students to connect with NC State's agricultural programs.

Results to Date

To date, the web portal's content that captures the most views have been blog posts about future career opportunities, namely the continuing high demand for agricultural careers. This emphasizes the need for academic departments to showcase resources to help students traverse college and careers. The web portal provides a feedback tab encouraging users to review each resource. To date, an article highlighting an Extension professional conducting farmworker safety and health programs has received the most favorable feedback, underscoring interest in career information and resources. An important implication of this initiative is that current and potential students seek and use career information from academic departments.

Future Plans

In the future, we plan to use the *Career Pathways* web portal to link students with pertinent career experiences, including internship opportunities. Notably, research has indicated that agricultural undergraduates perceive relevant career experiences, such as internships, as more important for their career preparation than their coursework (Feldpausch, 2019). Research is needed to understand students' web portal usage and how it can address their career-related needs. An intended goal for the *Career Pathways* web portal is to provide agricultural professionals with career development in the agricultural industry, further strengthening linkages among agricultural faculty, undergraduates, and employers.

Costs and Resources Needed

The university hosts the web portal using a WordPress® platform. NC State provides professional development in web portal creation and management. The major cost for this innovation is a grant-funded graduate student who produces and manages updated content.

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A Proposed Model for an Integrated
Three-Component Model of Elementary Agricultural Education

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**A Proposed Model for an Integrated
Three-Component Model of Elementary Agricultural Education**

Introduction

Georgia is one state that recently formalized the teaching of agriculture education at the elementary school level (Georgia House Bill 1303, 2022). Traditionally, formal agriculture education has been taught at the middle and high school levels with teachers certified accordingly (National Association of Agricultural Educators, 2022). A common practice among these teachers is to use the three-component model, which clarifies that any agriculture education classroom should utilize the related components of formal instruction, experiential learning, and leadership development to create real-world learning experiences. Though a notable and recognizable tool, the model has not been tested among teachers or as a classroom practice at the elementary level. The purpose of this poster is to propose a model for an integrated three-component model of elementary agriculture education (EAE) based on how Georgia EAE teachers are currently implementing EAE in Georgia. This project met the American Association for Agricultural Education's National Research Agenda Research Priority 4, "Meaningful, Engaged Learning in All Environments" (Roberts, Harder, & Brashears, 2016).

How it works/Methodology/Program phases/Steps

Croom (2008) illustrated a manifestation of the Agricultural Education Total Program, which has previously been considered most appropriate for those in secondary education. The three-component model illustrated in Figure 1 is based on the philosophical underpinnings listed in Table 1, which represent the secondary level manifestations of agriculture education as proposed by Croom. Adjacent to Croom's hypothesis are the proposed same philosophical underpinnings for elementary agricultural education.

Figure 1
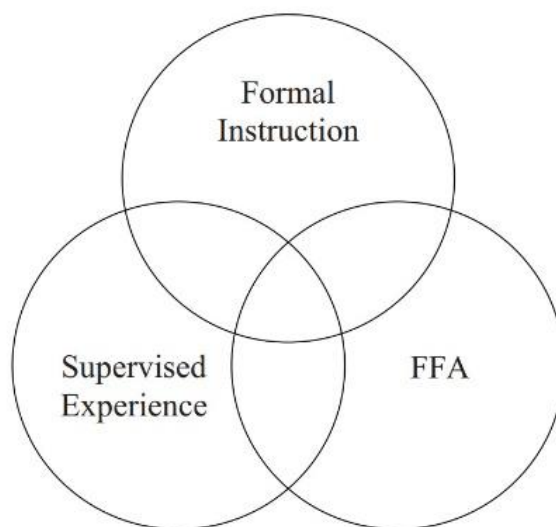*Diagram of the Integrated Three-Component Agricultural Education Model*

Table 1
Describing Philisophical Underpinnings and Manifestation at Secondary and Elementary Levels

Philosophical Underpinning	Manifestation at the Secondary Level (Croom, 2008)	Manifestation at the Elementary Level (proposed)
Cognitive Development	Formal Instruction	Formal Instruction
Experiential Learning	Supervised Experience	School Garden/Farm to School
Leadership Development	FFA	Citizenship (4-H, student org)

Cognitive Development: Formal Instruction has been adopted as the most appropriate mechanism to facilitate cognitive development in elementary age students by Georgia EAE teachers. While Georgia EAE teachers do not have an agreed upon lexicon to describe their formal instruction methods most EAE teachers use the terms: experiential learning, hands-on learning, inquiry-based instruction, and problem-solving.

Experiential Learning: Farm to School is a multi-faceted education program created to teach children about healthy practices around agriculture, food, nutrition, and the environment (National Farm to School Network, 2021). Several activities allow teachers to employ Farm to School, which are generally categorized under local procurement efforts, school gardens, and hands-on education.

Leadership Development: Citizenship is an activity that happens when citizens have power, influence, and responsibility to make decisions to positively impact their community (reference). The National FFA Organization currently does not recognize FFA below grade six; however, the Cooperative Extension Service's 4-H program has an existing curriculum focused on civic engagement as well as a long history of working with the elementary age students.

Results to Date/Implications

All 30 EAE programs in Georgia utilize formal instruction with an emphasis on experiential learning. Most EAE programs have some type of school garden and implement some Farm to School activities. Previous focus group studies conducted, but not yet published, among EAE teachers in Georgia support that school gardens are widely used and effective tools for implementing experiential learning at the elementary level. Leadership/citizenship education is the hindermost of the three components: some EAE teachers have started local FFA chapters while others have opted to start 4-H programs in their schools. Still others have decided to start new local organizations such as Garden or Ag Clubs.

Future Plans/Advice to Others

Local, School-Based Agricultural Education programs, including EAE, are community-based programs which should rely on the local teacher to determine the "best" way to implement the Total Program in their unique community. This model aims to demonstrate the functional as well as theoretical underpinnings of EAE so that administrators, new teachers, and parents understand possible best practices for implementation.

Costs/Resources Needed

There are no costs associated with this project.

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**A Proposed Model for Providing
Elementary Agriculture Teachers with Ongoing Professional Development**

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**A Proposed Model for Providing
Elementary Agriculture Teachers with Ongoing Professional Development**

Introduction

In 2019, Georgia initiated a pilot program to formally integrate agricultural education into public elementary schools serving grades K-5. The pilot included 30 teachers, all of whom needed professional development to increase their own pedagogical content knowledge (PCK) so they can develop agricultural literacy among their current and future students in K-5 agricultural education (Bailey et al., 2021). Professional development is important for all teachers' professional growth but is especially important in innovative and emerging educational areas such as Elementary Agricultural Education (EAE). One of the many challenges in implementing EAE teacher professional development is that *current* EAE teachers require hands-on professional development synchronously while *future* EAE teachers will need similar/same training each subsequent year. Traditional professional development models among middle and high school agriculture teachers may not be appropriate for EAE teachers because EAE teachers have different backgrounds, views, and resources regarding professional development. Therefore, the objective of this poster is to share one proposed model for providing EAE teachers with professional development. This project addresses the American Association for Agricultural Education's National Research Agenda Research Priority 5, "Efficient and Effective Agricultural Education Programs" (Roberts, Harder, & Brashears, 2016).

How it Works

The proposed model utilizes three components working together: an asynchronous repository website, an asynchronous online teaching platform, and synchronous face-to-face instruction. As much content as possible from each of these workshops is recorded and archived on the EAE website and Google Classroom for asynchronous delivery to future EAE teachers.
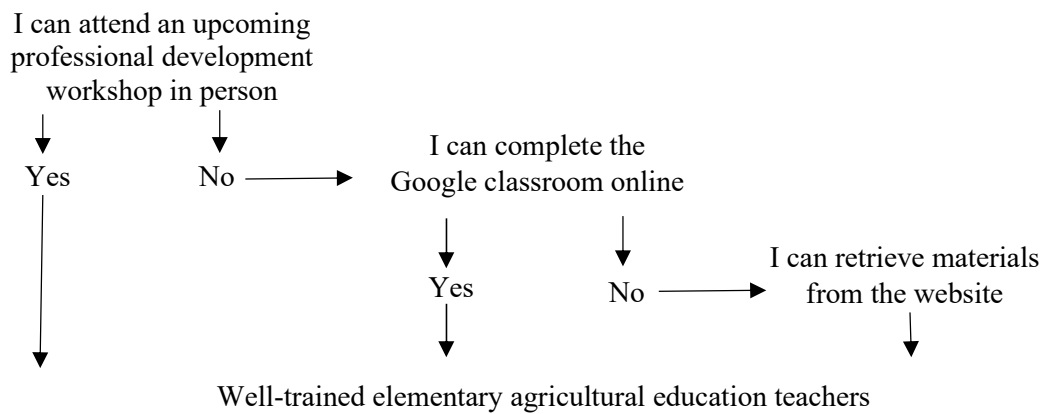
The first component is professional development workshops delivered synchronously by the Department of Agricultural Leadership, Education and Communication at the University of Georgia, Georgia Farm Bureau, and the Georgia Foundation for Agriculture. These workshops serve as practical examples of how new EAE teachers can conceptualize their local program. Each workshop is recorded and archived within the Google Classroom for absent and future EAE teachers. The second component, the Google Classroom, serves as an asynchronous component primarily focused on providing online workshops that teachers can continually attend or reference, especially if they are unable to attend an in-person training. The Google Classroom further acts as an archive of all professional development and training videos. Finally, the third component is a website that serves as a repository for EAE resources (e.g., curriculum, grants, etc.) As it is continually updated, it serves as a central-point of information for the EAE teacher. Relevant materials include professional development workshops, garden and agriculture-based curriculum, funding opportunities, and other related resources. Figure 1 depicts the interaction of these components over time.

Results to date

Approximately 10 of the 30 current EAE teachers have actively engaged in the professional development workshops, all of which (past and future) train EAE teachers in building community support (highlighting Cooperative Extension); establishing and utilizing school farms; establishing a farm-to-school program; and developing student interests in food, agricultural, natural resources, and human (FANH) sciences, experiential learning, and environmental education, as recommended by Bailey (2021). Workshop one piloted the Google Classroom. Upon completion of modules, teachers were eligible to apply for a mini-grant, and 5 teachers received mini-grants of $2,500 each. Updating the Classroom has been manageable, but there is a challenge in providing timely feedback for participants as the program lacks personnel to provide daily feedback. The EAE repository website grows as resources are added and EAE teachers increase adoption. However, a challenge that is foundational to continuing this training is identifying new EAE teachers who need training. The EAE program is new to Georgia, so teachers do not report to a state level agricultural education entity and are difficult to locate.

Figure 1

A Proposed Model for Accessing EAE PCK Professional Development Material

I can attend an upcoming professional development workshop in person

Yes   No → I can complete the Google classroom online

Yes   No → I can retrieve materials from the website

Well-trained elementary agricultural education teachers

Future Plans

This model currently operates in Georgia and may serve as a national model. A specific objective of the USDA/NIFA grant (Peake, 2021-2024) is to host five synchronous professional development workshops. Future plans involve workshops focused on the integration of experiential learning and environmental education into EAE. Observations of and feedback from these workshops will guide the development of a proposal of this model for a national level.

Costs

Several costs are associated with the synchronous professional development workshops, including travel reimbursements, workshop materials, and meals. Each synchronous workshop costs $6,000 - $8,000 to conduct. Additional costs include mini-grants to encourage teachers participation ($2,500 x 5 = $12,500). There are no costs associated with the asynchronous website and Google Classroom as they are available resources free to use.

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Building Community for Cooperating Teachers

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Introduction

One of the most powerful influences in the student teacher's internship experience is their cooperating teacher (Norris et al., 1990). Cooperating teachers can work to develop and strengthen their mentorship skills through professional development and mentorship programming (He, 2010; Young & MacPhail, 2005). Positive internship experiences can help student teachers improve their self-efficacy and potentially remain successful in their teaching career (Edgar et al., 2011; Hamman, et al., 2006; Rocca, 2005; Swan et al., 2011).

Beyond the preparation and support of cooperating teachers, efforts are also being made to help cooperating teachers feel valued and appreciated for their important contributions. The Department of Agricultural Education and Communication at the University of Florida has been working to build community amongst their partnering school based agricultural education (SBAE) cooperating teachers. This camaraderie allows teachers emotional and psychological support as they embrace their extensive cooperating teacher role and responsibilities (Erickson, et al., 2006; Kram, 1988). The use of building community has been found to be an effective pedagogy (Kraus & Sears, 2008). Lieberman and Miller (2008) support the use of work communities to aide in teachers' want to apply and embrace new skills learned in professional trainings. To build this community, Brown's (2001) three-stage process of community building was utilized with the 2022 cohort of cooperating teachers. These steps include: (1) building friendly relationships and (2) "community conferment" through pre-internship professional development and (3) "camaraderie" through monthly zoom meetings and a cooperating teacher recognition program.

How it Works

This program was designed to support SBAE teachers in their role as cooperating teachers and has grown to foster a community of SBAE cooperating teachers within the state of Florida. Prior to the spring internship, the cooperating teachers are brought together for an onboarding meeting via zoom. This is the first time they can connect with one another and begin to connect with others taking on this same professional responsibility. The onboarding meetings also introduce them to their mentor role as cooperating teachers, the expectations in this role, and provide guidance through a mentorship manual. Next, the cooperating teachers are brought together face-to-face to participate in mentoring professional development and are provided time to work closely with their student teacher to plan for the spring internship. Experienced cooperating teachers and student teachers share their insight on what worked best for them in their internship. Once the spring internship begins, the cooperating teachers utilize a cooperating teacher website as a support tool for the mentoring of their student teacher. Additionally, they are given the opportunity to participate in monthly zoom sessions with their fellow cooperating teachers. In these zoom sessions, their conversations revolve around celebrating their growth as a mentor, as well as some of their challenges and ways to approach them with their student teachers.

To continue to build the community of cooperating teachers, the SBAE mentors are recognized and celebrated by the university, their students, their student teacher, and the Florida FFA association. The teachers are highlighted on the Department of Agricultural Education and Communication at the University of Florida's Teach Ag website. The cooperating teachers are also recognized on stage at the Florida FFA association convention with their student teacher and presented with their agricultural education family tree. This family tree showcases their former agriculture teacher and cooperating teacher, as well as their current and past student teachers and

past students who have become teachers. Finally, the cooperating teachers are given a tuition waiver by the Department of Agricultural Education and Communication at the University of Florida that is good for one graduate course for every student teacher that they have supervised.

Results to Date

The program originated in 2018 to support school based agricultural education teachers in their role as cooperating teachers and mentors. Since then, a community of SBAE cooperating teachers has grown with the addition of professional developments, zoom meetings, and recognition. In 2022, 15 cooperating teachers participated in the Department of Agricultural Education and Communication at the University of Florida' cooperating teacher program. On a scale of 1 = extremely useful, 2 = very useful, 3 = moderately useful, 4 = slightly useful, and 5 = not at all useful, cooperating teachers rated resources and support that were provided during the internship. Cooperating teachers reported that the most useful resources were reminders for upcoming forms and assignments ($M = 1.33$, $SD = .49$), reminders for upcoming student teacher seminars and topics ($M = 1.47$, $SD = .52$), and mentoring tips ($M = 1.67$, $SD = .72$). Additionally, cooperating teachers participated in interviews where they expressed their appreciation for the support program, as well as how the monthly zoom meetings allowed them space to build a "family" of teachers willing to support each other.

Future Plans/Advice to Others

Future plans for this program involve the continuation of the cooperating teacher support program and the building of community amongst cooperating teachers. We are currently partnering with teacher preparation program in other states around the country in implementing cooperating teacher support programs of this kind. We have found this program to be effective in Florida and hope that this multi-state view will provide a broader perspective.

As we look to the future, funding opportunities for expanded support are being pursued. The funding would be utilized to provide substitutes teachers for cooperating teachers during professional development, as well as travel expenses for a two-day cooperating teacher training. Expanding from the current one-day training to a two-day training would allow for expansion of the mentorship training, time with their student teachers, and more time to build relationships with one another. Our hope is that addition funding would be utilized to supplement cooperating teachers with an honorarium for the time invested in this important role.

Our advice to teacher preparation programs is to identify a faculty member that is interested in spearheading this program and who is committed to its development. This faculty member should also work closely with the student teaching coordinator. We also recommend implementing this program in stages, potentially beginning with onboarding and professional development, a mentor manual, and then the addition of an online support platform, bi-weekly communication, monthly zoom sessions, and cooperating teacher recognition.

Resources Needed

The main resources needed to build a community of effective cooperating teachers include time for a faculty member, a budget for program implementation (~$500) and cooperating teacher recognition expenses (~$150), a collaboration with the state's FFA organization to coordinate cooperating teacher recognition on stage at convention, and the development of an online platform to house the website-based resource tools (~$200). Estimates total about $850 for the program. Graduate assistantship support is highly recommended to help with all aspects of this program.

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Building Professional Collaboration and Identity Through
Pre-service Agricultural Education Teacher Professional Development

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Building Professional Collaboration and Identity Through
Pre-service Agricultural Education Teacher Professional Development

Introduction

To be considered effective, school-based agricultural education (SBAE) teachers must possess a wide range of traits, including knowledge of agricultural subject matter, active planning of instruction, and professional engagement (Eck et al., 2019). Professional engagement activities, such as attending annual teacher conferences and participating in specialized professional development (PD) events, are vital to the development of competent SBAE teachers, as they help fill gaps in teachers' knowledge and skills (Phipps et al., 2008). However, to maximize the positive impacts of PD on teachers, programming should be conducted intentionally and proactively (Wells & Hainline, 2021).

Teachers' engagement in PD can impact their professional identity. According to Shoulders and Myers (2011), professional identity refers to SBAE teachers' perceptions of themselves as teachers and their place in the larger context of the profession. Shoulders and Myers (2011) noted that several factors influence SBAE teachers' professional identity development, including gender, the nature of the agricultural education profession, instructional practices, and societal expectations. Moreover, they suggested that agricultural teacher education programs can be especially influential in developing teachers' professional identity. Because of the social nature of professional identity development (Shoulders & Myers, 2011), self-segregation can occur as a social support mechanism among people with similar backgrounds, interests, and ideas (Moore-Jones, 2022). But, such practices can cause division and may hinder the "spirit of unity among classroom teachers" ascribed to by the National Association of Agricultural Educators ([NAAE] 2022, Our Mission section, ¶ 1).

With this in mind, there are currently four active agricultural teacher education programs in Arkansas. Historically, interactions between the programs and their respective faculty have been professionally cooperative; yet, student recruitment efforts between the four programs have tended to be quite competitive, particularly in recent years. Anecdotally, this competitive atmosphere between the four programs has helped foster university-related divisions among the SBAE teachers in Arkansas. Consequently, teachers have tended to gravitate toward engaging more frequently with their fellow university alumni versus with colleagues who graduated from other universities (i.e., self-segregation). To overcome barriers related to self-segregation based on agricultural teacher education program and positively impact the professional identity development of pre-service SBAE teachers, perhaps providing highly-collaborative PD for pre-service teachers might be a useful approach. Such programming could intentionally and proactively build a mindset of professional unity and cohesiveness, regardless of the agricultural teacher education program attended.

How it Works

The Arkansas Pre-service Teacher Conference was created to bring together pre-service teachers from each of the four agricultural teacher education programs for PD. Workshop sessions were designed to maximize involvement and collaboration among participants in order

to facilitate professional identity growth among the group. Workshop topics pertained to classroom management, working with community members, using social media to promote the complete SBAE program, Arkansas reporting requirements, professionalism, and using resources provided by the National FFA Organization. Additionally, joint experiences outside of the workshop sessions, such as meals and free time, were intended to foster relationship-building among the pre-service teachers.

Results to Date

In January 2022, state staff with the Arkansas Department of Education hosted the inaugural Arkansas Pre-service Teacher Conference, which was an intensive, two-day PD event designed for pre-service teachers completing their student teaching experience during either the Spring 2022 semester or the Fall 2022 semester. The event was held at Camp Couchdale, a centrally-located campground owned by the Arkansas FFA Association. Participants checked-in to the event mid-morning of the first day and ate lunch together.

Workshops were conducted throughout the first afternoon, followed by dinner. The participants were given free time after dinner and were encouraged to socialize and visit with each other. Several pre-service teachers from various universities used the free time to leave camp together and travel into the surrounding town. Breakfast was provided to participants on the second morning, which was followed by workshops both before and after lunch. The event ended in the late afternoon of the second day. This was the first year to host this event; however, anecdotal evidence provided by conversations with pre-service teachers was the event helped them develop relationships with future colleagues from other universities. Many of the pre-service teachers exchanged contact information and planned to contact each other during their student teaching experience for advice or help.

Future Plans and Advice to Others

The state staff at the Arkansas Department of Education plan to continue this event in the future. We recommend that in the future, planners seek out more sponsors (e.g., Arkansas Farm Bureau, Arkansas Cattlemen's Association, etc.) to help lower the overall cost of the program's delivery. Involving additional sponsors and inviting them to the event could help introduce the pre-service teachers and sponsors to each other, thereby fostering additional opportunities for relationship-building. We found this event to be a useful, practical approach to collaboration and professional identity-building between pre-service teachers from different universities. We recommend that other states consider adopting a similar approach if they do not currently do so.

Costs / Resources Needed

Pre-service teachers attended this PD event at no cost beyond their travel to and from the venue. The primary costs for event organizers were meals, workshop supplies, and giveaways, which equated to about $1,300.00 total. A curriculum company sponsored one of the meals. Because the Arkansas FFA Association owned the campground, lodging and workshop space were available at reduced cost. The cost to host this type of PD event will vary depending upon available resources.

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Caring Cards: A Peer-to-Peer Mental Health Intervention in Agricultural Communities

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Introduction/Need for Innovation

Less than 25% of Kentucky's mental health professional needs were met as of the fourth quarter of FY 2021 (Health Resources and Service Administration, 2021). Access to mental health professionals within Kentucky's agricultural communities is even more limited as services cluster around urban areas. Thus, farmers face significant chronic mental health care and outcomes disparities due to the lack of access to and distance from clinicians, as well higher health-care costs due to rural area low patient volumes (Taylor, 2019). Community-based mental health, as well as suicide prevention programs, have been cited as key to addressing the increasing worldwide suicide rate and are essential to addressing morbidity and mortality in the agricultural sector (Coppens et al., 2014; Kral et al., 2009). Communities can implement specific suicide prevention strategies relevant to their context and cultures. The Caring Cards program seeks to strengthen interpersonal connections within agricultural communities by providing a space for personal correspondence to promote peer support and network building.

Thwarted belongingness and perceived burdensomeness are the major interpersonal risk factors for suicide according to Joiner's Interpersonal-Psychological Theory of Suicidal Behavior (Van Orden et al., 2010). Caring Cards are a way to address thwarted belongingness by bolstering farmer social networks and peer-to-peer support. Caring Cards initiatives are based on the idea of "Caring Contacts," where individuals who are admitted to a hospital following a suicide attempt receive semi-regular contact from hospital staff or other caring individuals. Many individuals contacted as part of Caring Contacts expressed positive feelings of being part of the program (U.S. Department of Veterans Affairs, 2021). Caring Contacts has been shown to decrease rates of suicide in individuals who were admitted to a hospital after a suicide attempt over a two-year period: 1.80% of patients who had received letters went on to suicide compared to 3.52% of patients who did not receive letters (Motto & Bostrom, 2001). Studies that evaluate the effect of various post-discharge interventions generally show reductions in suicide deaths, attempts, and ideation as a result of the intervention (Luxton et al., 2013). Caring Cards takes support out of a clinical setting and into a peer-to-peer setting. Originally implemented in the veteran community to address high rates of suicide, Caring Cards initially involved veterans with mental health concerns by sending handwritten cards to their peers. According to the 2017 Census of Agriculture, 11% of the nation's producers are veterans or are currently serving in the armed forces as compared to 6.9% of the general US population (USDA, 2020).

How it Works/Methodology

The Southeast Center for Agricultural Health and Injury Prevention (SCAHIP) has developed 5 Caring Cards for distribution. The design and messages of the cards were evaluated at numerous community-level events. Upon approval of pilot funding, the team will identify 3 small, bounded communities through agriculture extension in which to test the cards (e.g. gardening club, cattleman's club, 4-H club leaders. etc.). Once a partnership is established, the Caring Cards and envelopes will be sent to the organizations for them to distribute and disburse. Participants are asked to write personalized messages on the inside of the cards and either mail or hand deliver the cards to someone whom they believe is facing a difficult time. Each card has a QR code on the back which, when scanned by the recipient, will take them to a brief survey.

The cards have simple designs with positive messages inspiring gratitude, comfort, and positive affirmations. For example, one message, "Thinking of You," was included to address

geographic, occupational, and social isolation present within agricultural communities. The insides are left blank for the senders to write personalized messages to the recipient. In fact, personalization is encouraged. The cards were designed to have minimal influence on the sender's message while still being aesthetically appealing.

Results to Date/Implications

To address mental health concerns within the agricultural community, the team developed 5 Caring cards for distribution and introduced them in a number of agricultural domains, such as county Farm Bureau meetings, the Kentucky State fair, and farmer appreciation days where the cards were made available to community members for free. A total of 1439 cards were distributed. During these events, community members were polled on their opinions about the cards, such as which cards they felt were most visually appealing and which messages they felt were most important for farmers to hear. Many individuals stated that they would like to be involved in the program and that mental health and suicide were important concerns to address within their communities. Based on positive reception at these events, Caring Cards are now pending pilot funding where they will be piloted in 1-3 bounded communities. New cards will be designed and distributed to the partner communities where they will be available for members to send to one another, sharing messages of compassion and support. Since cards will be sent and received from within the community, interpersonal connection and integration should be increased among participating individuals.

Future Plans/Advice to Other

Pending pilot funding approval, Caring Cards will be implemented in 1-3 bounded communities, such as commodity subgroups within a county. Cards will have a printed QR code which participants can scan and take a quick survey which will inform the social networks participants are a part of as well as impact of the cards on mental wellbeing. The period of pilot testing will be used to gauge effectiveness and allow for adjustments to be made. Following the pilot study, further dissemination and implementation of Caring Cards throughout the Southeast region and into other regions would be ideal. Besides the identified bounded communities, various organizations could create and send Caring Cards in the future, such as teachers, youth organizations, Farm Bureau, and Women in Ag. Due to the personal, community-level nature of the Caring Cards program, uptake by individual communities is necessary for farmers in that community to reap the benefits.

Costs/Resources Needed

The designing, purchasing, and printing of the cards was the largest expense. Through funds provided by the Southeast Center for Agricultural Health and Injury Prevention, the cards and envelopes were funded for each participating youth organization. The cost was approximately $0.17 per 1-2-color card, $0.26 per 4-color card, and $0.10 per envelope. Additional costs may be incurred through dissemination of the cards (do cards need to be mailed or shipped), while resources (space, displays) may be needed if the cards were to be housed at different sites. For the sustainability of the project, organizations will be asked to provide resources to assist in the production costs of the Caring Cards.

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Designing for Success: Instructional Design to Support Online Instruction in Agricultural Education

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Introduction

The popularity of distance education continues to grow. Research indicates an increase in both the number of college courses being delivered and the number of students enrolling in online offerings (Allen & Seaman, 2017; National Center for Educational Statistics, 2022). The online learning environment can be both convenient and challenging to learners. Participants of online learning courses described that the design of a course, familiarity with online technologies, and time management are helpful when participating in an online learning environment. Students reported the design of a course contributed the most to a successful online learning experience (Song et al., 2004). Participants of online learning courses also noted that a lack of community, difficulty understanding instructional goals, and technical problems were among the challenges of participating in an online environment. From these various challenges, participants identified that the biggest challenge is being prepared for and troubleshooting technical problems (Song et al., 2004).

NC State University offers numerous online opportunities, from individual courses to entire online degree programs at both the undergraduate and graduate level. To provide high-quality and innovative learning experiences when completing online courses, faculty at NC State have the opportunity to participate in the Course Quality Program. Through this program, faculty members can pursue "professional development, instructional consultations, resources, course and program reviews, and pathways to recognition and certification of high-quality online courses and programs" (NC State University, 2022). One specific certification is offered through Quality Matters (QM). Quality Matters is a global organization that strives to support faculty in the development and delivery of quality online education. QM has established guidelines and recommendations to encourage continual review and improvement of distance education courses and the opportunity to validate the quality of courses through participation in a rigorous peer review process (Quality Matters, 2022).

As members of the Agricultural Education faculty have participated in the Course Quality Program, numerous ideas and suggestions have been shared and implemented to improve online courses. Specifically, two innovative ideas will be highlighted, which can benefit any online courses whether pursuing Quality Matters certification or not.

How it Works

Innovative Idea One - Development of a Course Map

In any course, it is helpful for students to understand the alignment between how module objectives, instructional materials and learning activities, and assessments all align to support course objectives. In order to illustrate these connections, course maps were developed and included in the introduction of the course to help students better recognize the overall goals of the course and how the learning activities and assessments relate to objectives. Additionally, the creation of the course map has been helpful in providing a more thorough explanation of each module and assessment and structuring the learning management system.

Innovative Idea Two - Development of Detailed Assessments and Discussion Forums

Assignments and discussion forums, especially in asynchronous distance education courses, may not always provide explicit instructions and lack clarity of the connection to the module and course objectives. In response, assessments were updated to include the specific module objectives met by completion of the assignment. Additionally, the contribution of each assignment to the overall course grade was added, as well as a reminder of the grading rubric or guide and how feedback would be provided. The same information was added to discussion forums, along with criteria to help structure forum posts and feedback. The indicator for activity completion was also set up in the learning management system.

Results to Date

To date, three Agricultural Education faculty members have participated or are currently participating in online course improvement efforts. Course maps have been developed and implemented in one undergraduate and three graduate courses. The assessments and discussion forums have been updated in two graduate courses. The development of a course map is in progress for an additional undergraduate course and the assessments and discussion forums are currently under review in two undergraduate and one graduate courses. Two courses have received QM certification.

Future Plans

The efforts to update and improve the distance education course offerings are ongoing. Program faculty intend to make similar revisions to the two remaining distance education courses offered for agriculture teacher preparation at the undergraduate level and also the three remaining courses required as part of the alternative licensure program. Ultimately, the goal is to have all of these courses QM certified.

Costs/Resources Needed

The creation of course maps and the update of assessments and discussion forums require an investment in faculty time. Also, to submit a course for QM review, the cost is $1300. Fortunately, NC State provides one-on-one support from their instructional design team, a stipend to support faculty time, and covers the cost for the QM course review.

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Developing Online Pedagogical Content Knowledge Learning Opportunities for Elementary Agriculture Teachers

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**Developing Online Pedagogical Content Knowledge Learning Opportunities for
Elementary Agriculture Teachers**

Introduction

Agricultural education teachers are traditionally certified to teach at the middle and high school levels (National Association of Agricultural Educators, 2022). Georgia, among other states, recently sought to formalize teaching agriculture at the elementary level because of the touted benefits for young children (Georgia Senate Bill 330, 2018). For example, a growing concern is a lack of agricultural literacy among today's youth, a problem because agriculture and its related production influence numerous areas of life (Hess & Trexler, 2011; Koy & Tarpley, 2020). Though acknowledged as important, no corresponding certification for elementary agriculture education (EAE) teachers exists as it does for secondary agriculture teachers. Currently, in Georgia, some elementary agriculture teachers are certified in elementary education, while others are certified in agriculture education. Previous research by Peake et al. (2020) aimed to develop standards for elementary agriculture education, but no corresponding research exists on how to train elementary or agriculture teachers in these standards. Addressing this knowledge gap is one goal of *Professional Development for Agricultural Literacy in Elementary Agriculture Teachers* (Peake, 2021-2024), a NIFA/USDA grant supporting training for elementary agriculture education at large. A specific objective of the grant is to "develop EAE teachers to apply Pedagogical Content Knowledge (PCK) within teaching Food and Agricultural Sciences," where PCK is the result of knowing *how* to teach (pedagogy) the *what* to teach (content) (Shulman, 1986). The following innovative idea is an explanation of "Ag Ed 101," an online Google classroom designed to prepare elementary agriculture teachers with appropriate PCK. This project aligned with the American Association for Agricultural Education's National Research Agenda Research Priority 5, "Efficient and Effective Agricultural Education Programs" (Roberts, Harder, & Brashears, 2016).

How it Works

The "Ag Ed 101" Google Classroom is an easy-to-use training site for those interested in teaching agriculture at the elementary level. There are six learning modules total, which include: 1) Ag Ed for Georgia's Future; 2A) Cross Curriculum and Ag, 2B) EAE Curriculum Standards; 3) Put the "A" (Ag) in S.T.E.M.; 4) Hands-on Learning; 5) External Resources; and 6A) Community Partnerships and 6B) Local Steering Committees and Advisory Boards. Introductory and concluding modules also accompany the learning modules and provide teachers with an overview of the course and relevant contact information. Within each learning module, teachers will find one to four videos featuring a professional or expert from a different organization across the state (e.g., Georgia Farm Bureau, University of Georgia, University of Georgia Extension, Georgia Department of Education, etc.). Some videos have an accompanying task, assignment, or short quiz. For example, Module 2B guides teachers through the website of Georgia's elementary agriculture education standards. The corresponding assignment asks teachers to complete a lesson plan based on one or multiple of these standards.

Results to date

Thirty-three teachers enrolled in the pilot round of the Ag Ed 101 Google Classroom. Of the 33 teachers, five applied for and received mini-grants. Several in-person events followed the pilot round, including an all-day field trip focused on learning about how to implement agriculture in an elementary classroom (20+ attendees) and two focus groups dedicated to learning about elementary agriculture educators' school gardens (6 and 11, respectively).

Future Plans

The Ag Ed 101 Google Classroom first operated as a pilot program and is one of the first attempts to provide EAE teachers with PCK. The next step is to conduct a program evaluation. Stufflebeam (1971) suggested that the Context, Input, Process, and Product (CIPP) evaluation model can guide improvement and decision-making in the education setting. The goal of the entire evaluation is to answer, "What should we do? How should we do it? Are we doing it correctly? and Did it work?" (p. 5). Each component also consists of three steps: determining, attaining, and sharing of pertinent information. The following briefly outlines how CIPP will be used to evaluate Ag Ed 101. The context evaluation will examine the precursory idea for the project versus where it stands now (Stufflebeam, 1971). For example, the initial idea was conceived as a training course that elementary or agriculture teachers could participate in to learn more about either designation. Given the COVID-19 pandemic, the classroom was conceptualized in an online format. If the program is to continue in this format, program developers should ask what its current unmet needs, potential opportunities, and main problems are. The input evaluation will focus on gathering information pertaining to personnel, resources, and procedures, and examining research about any similar programs (Stufflebeam, 1971). Regarding gathering information, personnel, for example, would include program administrators and video presenters, many of whom are no longer in these same positions. A relevant question becomes, should the videos be redone to more effectively highlight the presenters' roles in supporting elementary agriculture education? Process evaluations seek to examine how well the program functions, where the overarching questions ask how well the plan is being implemented and if there are barriers to this process (Stufflebeam, 1971). Data in the form of reaction forms or surveys, pre and post-questionnaires, among other methods, can be used to guide future revisions. The product evaluation seeks to determine how well the program met its goals (Stufflebeam, 1971). Clear criteria and objectives should be set for the success of the program so that administrators can decipher if the program accomplished its intentions.

In sum, using questions listed in Stufflebeam's (1971) CIPP evaluation will guide the future directions of the program and the development of new PCK materials and modules for elementary agriculture teachers. Another important consideration for the program's longevity is participant recruitment. Although the Ag Ed 101 Google Classroom is an online platform, a further future goal of the CIPP evaluation is to determine how the material could be used in-person or otherwise by those in other states also looking to train elementary agriculture teachers.

Costs

There is no anticipated cost associated with this project as university faculty intend to conduct the evaluation as part of their regular duties. However, individuals considering taking on this project should consider whether they have the support of their state's agriculture specialists and if they would have time to continually review and refresh such a website.

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Engaging and Educating Agricultural Educators through In-State Study Experiences

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Innovative Idea

Engaging and Educating Agricultural Educators through In-State Study Experiences

Introduction/Need for Idea

As FFA members, we can all recite the words of the FFA Creed, however, today many of our students pursuing agricultural-related degrees do not come from farms or have the agricultural background knowledge that the creed describes. For students majoring in Agricultural Education or Extension, this background knowledge is incredibly important as they embark on careers that ultimately will place them in situations where they are leading classrooms and programs specifically focused on agriculture. While students enroll in university courses and many contain labs, these experiences often only offer a glimpse into the real-world component. Immersive experiences with farms, ag ed programs, Extension programs, and agricultural industries allow students to connect content knowledge with real-world opportunities and perspectives that can be integrated into extension programming and curriculum development. Immersive field trips provide an experience that is unattainable within the classroom while strengthening them personally and professionally (Bruening et al., 2002). Further, it is important that the most up-to-date agricultural practices are known and future educators share these experiences with their students (Luckey, 2012).

How It Works/Methodology/Program Phases

After generating the idea to develop an in-state study experience, team leaders researched grant opportunities that were available to support a fall break study tour. The team applied and secured funding through the North Carolina Tobacco Trust Fund Commission to support the extended field trip experience and cover the majority of the costs for students. It was important to secure funding that supported almost all costs so as to not prohibit students from attending due to financial constraints. The group selected fall break as the time for the trip to avoid conflict with popular spring break excursions or summer study-abroad experiences. From there, team leaders reached out to farmers, Extension agents, agriculture teachers, and industry representatives to develop a schedule that highlighted all four equally. Visits were encouraged to have a hands-on component if possible to allow students an opportunity to experience equipment and technology while "seeing" themselves in this career. The team leaders were split into two different groups and two in-state study experiences occurred. One group headed west and another group headed east. During the study tour, students engaged in conversations with agricultural leaders to learn more about why they chose that particular career path while also increasing their agricultural awareness. Following the trip, each participant selected one visit from the trip and developed lesson plans that could be used by an Extension agent or agriculture teacher. The lesson plan was aligned with the North Carolina course of study and promoted student learning and higher-order thinking skills. The lesson plans were distributed to teachers and agents in hopes of providing real-world context and examples that highlight the most up-to-date practices, emphasize agricultural career opportunities, and increase ag awareness.

Results to Date/Implications

During the fall break in-state study experience, twenty students participated and were led by four faculty members. All students have an interest in pursuing future careers related to agriculture and were majoring or minoring in Agricultural Education and/or Agricultural Extension, or were considering seeking a career as an agriculture teacher or Extension agent. Visits included both small and large family farming operations, processing facilities, farm markets, secondary agricultural education programs, Extension programs, research facilities, commodity organizations, historical locations, and state parks. All students indicated that the experience opened their eyes to new careers and expanded their knowledge and awareness of agriculture. Student A stated, "It was my first time in a cotton picker. I was amazed at the technology and the process involved from the field to our clothes." Another individual indicated being surprised at the challenges that farmers experience, yet their dedication and devotion to the profession are unwavering. The four faculty saw another benefit to this experience that was not part of the original objectives. Student participants grew together as a cohort and the discussions that took place after each visit in the van were reflective and showed a deeper understanding of agriculture. In addition, several of the students had never traveled to the parts of the state that were visited. One student never had imagined wanting to student teach anywhere farther than an hour away from home. She now wishes to student teach in the mountains and find a teaching job there due to this experience. This will be approximately four hours from her home.

Future Plans/Advice to Others

This study experience was incredibly beneficial for all who participated. The team leaders hope to make this experience a course offering similar to a study abroad experience. Without the grant funding, a few students indicated that they would not have attended due to financial constraints so it is imperative to secure funding that can assist with the costs. While this grant was a one-time funding source, several of the commodity organizations would be willing to sponsor a meal or component of the trip in the future. In addition, an hour per stop was budgeted, however, the majority of the stops took longer than an hour, especially when students had additional questions. Further, it greatly helped that most of the tour stops and presenters who spoke to the students were viewed as leaders in [State] agriculture. Their stories and explanations highlighted the "joys and discomforts" and encouraged students to think about their impacts.

Costs/Resources Needed

The grant provided $24,000 to lead two study tours. The major costs associated with the trip were hotels, meals, and transportation. The trip utilized university vans, but there was still a cost associated with using those for trips. Students were encouraged to room together at hotels, but due to COVID concerns, some students opted for single rooms which placed that budgeted item slightly higher than expected. The majority of the meals were supported by the grant with the students paying for only three total meals. Hotels with breakfast included were also a determining factor to cut down on costs.

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Escaping a Lecture: Utilizing a Digital Escape Room to Introduce the SAE for All Model

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Introduction and Need for Innovation

In the experiential learning course for pre-service and alternatively certified school-based agricultural education (SBAE) teachers at North Carolina State University, the SAE for All model (The National Council for Agricultural Education, n.d.) has been introduced early in the semester since its adoption by The National Council for Agricultural Education. This initial introduction has included a lecture and a worksheet where students explored the SAE for All Teacher Guide (The National Council for Agricultural Education, 2017). For the fall 2022 semester, the instructors wanted to be more intentional in having students move through the stages of the experiential learning cycle (Kolb, 2014). After seeing a presentation at the North American Colleges and Teachers of Agriculture conference (Riedel, 2022) and in an effort to also differentiate instruction and introduce gamification to their students, the instructors chose to introduce the SAE for All model through a digital escape room built in Google Slides.

How it Works

The digital escape room was created in Google Slides and began with a relatable scenario followed by a "room" where students had to find the hyperlinks to a Google Form where they would enter the secret code to "unlock" the door and to six separate puzzles that needed to be solved. Each puzzle was related to the SAE for All model or content found in the SAE for All Teacher Guide. The puzzles were designed to challenge students to identify information about SAE for All and then decode the answer from the puzzle that would be used as a "key" to escape the room. The puzzles were numbered and had to be entered chronologically into the Google Form "lock" in order to enter the next piece of the passcode to successfully "unlock" the door.

The instructors utilized this activity with two sections of this course in fall of 2022. The in-person section contained 12 undergraduate students and the online section contained 26 students that were a mixture of undergraduate and graduate pre-service and current SBAE teachers. The instructors first used the activity with the in-person section to be able to answer questions and address any issues or items to fix for students to successfully "escape". This strategy worked well, allowing instructors to clarify and fix several small items prior to assigning it to the online students. The following week, the digital escape room was assigned to the online section, where they had a week to complete the activity.

Results to Date and Implications

Out of the 38 combined students, 36 completed the activity and "escaped" the room. Several weeks after the assignment was completed, the instructors surveyed the students using an anonymous Google Form, receiving feedback from 26, which was mostly positive.

When asked for positives, many students indicated that they enjoyed being able to do puzzles and the change from their typical college classwork. One student from the online section shared that they enjoyed "The puzzle activity and the creativity of the activities." noting that "It is nice to step away from typical papers and discussion posts." Another stated, "I'm personally not very techy so the Google interactive escape room was a cool element. I liked how it was like pieces to a puzzle." Many shared that they would love to learn how to make a digital escape room to use with their students. One participant shared, "I really enjoyed the activity and it gave

me a great idea that I can incorporate in my future classroom. I thought it was fun and engaging and very memorable!"

When asked about areas of improvement, students from both sections identified that they did not like the additional step of having to "make a copy" of the puzzle documents to be able to edit and decode the answers. Several participants from both sections indicated that a specific puzzle tripped them up and it needed more clarification on the instruction page. Since the in-person class was only given 30 minutes of class time to work, several students shared that it felt time consuming because they were unable to finish it during class. One student suggested, "Maybe make it a little bit shorter considering how short class time is or doing it over 2 class periods." One student that did not successfully "escape" the room shared why they chose to not finish the assignment stating, "I also did not like that you could not submit the next puzzle on the Google Form without having the correct answer. I ended up leaving it incomplete even though I did have some answers because I could not move on and add what I understood for partial credit."

Future Plans and Advice to Others

Overall, this activity was well received by students and the instructors plan to continue to use this activity in the future and incorporate digital escape rooms into their other courses. This digital escape room was an effective way to familiarize students with the SAE for All model for both in-person and online classes. As the instructors reflect on this experience and the feedback from their students, offering training on how to make an escape room could be a useful topic in a teaching methods course or in a seminar during student teaching.

For others considering incorporating digital escape rooms into your courses, be sure to give yourself plenty of time to build it. To start, consider watching some YouTube videos or reading blogs from secondary teachers for ideas and best practices for the mechanics of a digital escape room. Think through the learning objectives you want your students to achieve through their completion of the digital escape room, then plan ahead by designing the questions and puzzles before building the actual escape room and lock. When designing puzzles and clues, be as specific as possible without giving away the answers. When setting up the puzzles within different Google Slides or Google Docs consider changing the share settings to "force copy" so students can automatically edit the files instead of having to "make a copy" themselves. When you have finished building your digital escape room, consider having someone with limited knowledge of the topic complete it prior to having students attempt it to gauge how long it may take your students to complete and to identify potential barriers for completion. When implementing a digital escape room with an in-person course, be prepared to provide encouragement when students initially push back against the challenge.

Costs and Resources Needed

The major resource needed to build a digital escape room is time. While the initial input of time can be significant, it took the instructors over ten hours to build the activity, once it is established it should not need a significant time investment in the future. Students will need a general understanding of escape rooms and Google Workspace to avoid unnecessary questions and frustrations during the activity.

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**Facilitating an Early Field Experience via a Regional
Career and Technical Education Outreach Event for Underrepresented Students**

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**Facilitating an Early Field Experience via a Regional
Career and Technical Education Outreach Event for Underrepresented Students**

Introduction

Agricultural teacher education programs should provide opportunities for pre-service teachers to develop and hone their knowledge and skills (Wells et al., 2018; Whittington, 2005). Because the list of technical skills that early-career teachers should have is quite lengthy and diverse (Albritton & Roberts, 2020), it is vital that there exist practical opportunities for pre-service teachers to grow and develop into well-prepared, competent professionals. Early field experiences (EFE) are used to help expose pre-service teachers to the realities of teaching public school students while allowing them opportunities to refine their teaching-related knowledge and skills (Wells et al., 2018). Perhaps the implementation of an EFE that combines pre-service teachers honing both their technical skills and teaching skills while serving the needs of underrepresented high school students would be pragmatic.

Project Phases / How it Works

Females are often underrepresented in many areas of Career and Technical Education (CTE) programming (Hamilton et al., 2015). Thus, therein lies an opportunity to collaborate with others to help address this issue. During the Spring 2021 semester, I began collaborating with personnel at a local educational cooperative who were pursuing state-level grant funds to help develop female high school students' interest in technical careers (e.g., welder, electrician, etc.) and CTE more broadly. They sought to partner with educational institutions across Arkansas to help deliver engaging, hands-on experiences in different areas of CTE to female students enrolled in high schools throughout the region via a series of one-day, on-campus events. As part of Southern Arkansas University's (SAU) contribution to the project, we concluded that such experiences could be delivered by well-prepared, technically-competent pre-service teachers. Using this approach to deliver the event's activities provided a practical opportunity to address the need for pre-service teachers to engage in an in-depth, high-quality EFE while serving underrepresented students.

Upon receiving confirmation that the grant was funded, I began working with a team of 14 carefully-selected pre-service teachers to plan for the specific activities that would be conducted during the event. Serving as the event coordinator, I recruited each pre-service teacher based on their individual background, expertise, and interest regarding teaching technical skills. Ten of these pre-service teachers were female and four were male. Considering the human capital, facilities, consumable materials, tools, and equipment that I had available in comparison to the available funds for SAU's portion of the project ($12,000.00), I consulted with the pre-service teachers and the educational cooperative personnel to determine the most suitable activities to develop. When viewing all of the aforementioned factors holistically, we concluded that the following six agricultural mechanics activities would help to both address the scope and intent of the grant-funded project and facilitate a high-quality EFE for the 14 pre-service teachers: (1) wiring electrical circuits, (2) using a plasma cutter, (3) using an oxy-acetylene torch, (4) using an arc welder, (5) using woodworking equipment, and (6) performing routine vehicle maintenance procedures.

Numerous planning activities were undertaken by various event stakeholders. The educational cooperative personnel were responsible for both disseminating information about the event to high schools throughout the region and handling event registration. They submitted all registration information to me for processing and student activity scheduling. I consulted with various SAU personnel to: (1) arrange for campus ambassadors to lead student through their event rotation activities, (2) procure meeting room, classroom, and laboratory spaces, and (3) provide lunch for the pre-service teachers and the high school students, teachers, and counselors who were on-campus that day. In October 2021, I worked with each pre-service teacher to help them: (1) identify suitable learning objectives for high school students, (2) plan the specific activities that they would be leading, (3) prepare their teaching areas, and (4) procure the necessary safety items and consumable materials for their respective activities. The event took place in the SAU Agricultural Education Facility (AEF) Shop on Friday, November 5, 2021 and directly served 80 high school students. Each high school student participated in three activity rotations based on their self-reported activity interests. Each activity rotation was facilitated by at least two pre-service teachers and lasted for approximately 45 minutes. Fifteen minutes was allocated between each rotation to allow the pre-service teachers time to prepare for the next incoming group of high school students.

Implications, Future Plans, and Advice to Others

After the event concluded, I met with all 14 pre-service teachers to debrief and discuss their experiences related to the event activities. They shared myriad positive comments about their work preparing for and delivering their respective teaching activities and consistently indicated that despite the struggles they encountered (e.g., student disinterest in particular activities, unexpected issues when using a piece of equipment, etc.), they enjoyed the process of teaching high school students. They expressed ideas about how to improve upon their own skills for teaching technical subject matter. They also shared suggestions for improving the event's layout and indicated that they would be interested in helping to facilitate the event again in the future, all of which engaged them in the reflective component of EFE, which is critical for their continued evolution into competent, prepared, and effective teachers (Wells et al., 2018). I plan to continue hosting this event each academic year as the availability of state-level grant funds permits. I plan to continue working with the appropriate aforementioned stakeholders to successfully deliver this event. I recommend that other agricultural teacher educators explore opportunities to use events like this one as EFE activities for their pre-service teachers. Anecdotal evidence suggests that doing so helps to better inform pre-service teachers about their own career decisions while making direct impacts on underrepresented high school students.

Costs

To support this event and its aligned EFE activities, it cost approximately $12,000.00 to procure the additional tools, equipment, and consumable materials beyond what was already available in the SAU AEF Shop. I wish to note that many of the items purchased to support the event activities (e.g., 10 new welding helmets, two new welding machines, etc.) will likewise support future iterations of the event and facilitate agricultural mechanics instruction for pre-service teachers at SAU. The impact of these funds will have lasting results. Beyond monetary expenditures, time was the most significant investment.

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Increasing Intercultural Competence Through Food

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Introduction/need for innovation

International students are still migrating to the United States at an increasing rate (Institute of International Education, 2019). International students are an invaluable financial benefit to universities in developed nations, but they are also individuals who enhance these nations with their diverse heritage and perspectives, increasing cultural awareness and respect (Bevis, 2002; Harrison, 2002). The diversity of students in Unites States schools is growing, which points to the need for intercultural competence development to engage students from different cultural backgrounds and establish cross-cultural relationships. When interacting with others who are linguistically and culturally different from oneself, intercultural competence refers to the "abilities needed to perform 'effectively' and 'appropriately' (Fantini, 2009). According to a complete definition, intercultural competence is the capacity to successfully navigate cultural differences and effectively use practical communication skills to accept the diverse identities of people in their surroundings (Chen & Starosta, 1996).

Food items are considered the most culturally sensitive since patterns, national tastes, and preferences differ significantly (Whitelock & Pimblett, 1997). The National AAAE Research Priority 7: Addressing Complex Problems guided this activity (Roberts et al., 2016). This priority area underscores informal learning beyond the classroom to develop contextual understanding (Roberts et al., 2016). This cross-cultural non-formal learning activity aimed to increase cultural awareness and enhance intercultural competency among domestic and international agricultural students from the United States, Ghana, and Nigeria by connecting them through discussions about food items and commodities. The objective of this innovative activity was to: (a) identify the different food items and commodities each person was most familiar; (b) identify differences and similarities in these food items; and (c) identify how students access and utilize commodities in their "home" regions.

How it works

The idea for this activity came from a discussion about food items between an international graduate student and her advisor. This conversation made them realize the cultural differences between international and domestic graduate students and how to use a shopping experience to foster cultural awareness. This project was designed to create an experiential learning opportunity for students and deepen relationships between international and domestic students.

Participation was voluntary, and all on-campus graduate students (18 total) received an email invitation overviewing the goal of the activity. Eight students expressed interest and availability based on recruiting emails, and six participated in the actual experience. Three participants were international students, two students from Ghana and one from Nigeria, and three domestic students all from different states (Arkansas, Georgia, & Texas) participated. A supermarket, with a variety of food items, was selected. The experiential learning activity included a worksheet completed before the supermarket visit, an icebreaker at the start of the activity, a worksheet to guide participants, and written reflection questions completed at the end of the activity.

The pre-worksheet sought to capture information about common food items accessed in participant's home locations, products used weekly, types of food prepared with the food items, and food preservation techniques used. During the one hour and thirty minute supermarket activity, participants completed an icebreaker and the first question on the worksheet together. One adjustment was made as all participants visited the fresh, alternative, and dried milk sections

together. This adjustment was made as the facilitators recognized hesitation among participants about the process. This ensured everyone understood the process, since people would be in different locations and would not have access to the facilitators to ask questions. Next, an international student was randomly paired with a domestic student, and went through the rest of the activity by visiting each section of store for the food items listed in the worksheet (eggs, maize, beans, rice, fruit, vegetables). In the end, participants gathered and debriefed about their overall experiences. This was participant driven and sparked conversations about food similarities, differences, and what participants learned from their peers. The final part was a post worksheet to collect thoughts about what was learned, feelings about interacting with others and discussion about their "home" food products, and perceptions about cultural food considerations.

Results to date

This was completed one time with six students, three domestic and three international students during the second month of fall semester courses. Based on the worksheet designed to collect informal feedback on the experience; overall, domestic and international students recorded a positive experience and enjoyed the ability to talk about food not only because of their involvement in agriculture but because it is a universal topic (Whitelock & Pimblett, 1997). One participant stated he liked to learn about different cultures through food and it made him appreciate other different foods and their storage method. One student reported, "it opened my mind to think about the differences in how food production exists in different countries". Another stated it was a great experience that exposed him to the uniqueness of different cultures and how similar food items are uniquely processed and consumed in different cultures. The facilitators of the activity have observed a shift from formal role-defined relationships (formal peer-to-peer interactions) to more relaxed and friendship-based interactions between the participants.

Future plans/advice to others

It is advised that faculty include intercultural learning opportunities, beyond the classroom, and work to foster and strengthen relationships between international and domestic students as the number of international students studying in the United States rises. The facilitators suggest experiential activities that bring students together around shared but unique experiences, like food. Additionally, the facilitators plan to repeat this activity with new international and domestic students because it fostered relationships beyond professional and academic responsibilities.

Costs/resources needed

Financially, there was not expense for this activity. The major resource investments were the activity plan and the worksheets developed to get people to fully engage in the experience. The total time spent was one hour and a half in the store doing the whole process and three hours developing the activity and recruiting participants. The facilitators provided copies of the worksheets, pencils, and clipboards to improve ease during the experience. A faculty member provided a ride for students, if needed, due to university transportation being time intensive for off-campus locations. A supermarket that offers a wide variety of food items is beneficial.

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Integrating Agriscience: Using Hands-on Teaching to Develop Hands-on Teachers

Introduction/Need for the Idea

Science, Technology, Engineering and Math (STEM) concepts have been identified as beneficial to increasing student knowledge in science (Ricketts, Duncan, & Peake, 2006) as well as being seen as an integral part of agricultural education (Stubbs & Myers, 2016). In a national study conducted by Shoulders and Myers (2013) it was reported that agriscience teachers spend approximately 43% of their time providing concrete experiences and only 12% of their class time engaging learners in active experimentation.

Kolb's (1984) Experiential Learning Theory (ELT) is a method by which learners use experience to enhance learning. According to Kolb, ELT can be defined as "the process whereby knowledge is created through the transformation of experience. (Kolb 1984, p. 41). Kolb's ELT allows for learning through four modes with the facilitator or instructor being responsible for guiding learners through the experiences. The model consists of grasping learning through concrete experiences and/or abstract conceptualism and then transforming that learning through reflective observations and/or active experimentation (Kolb & Kolb, 2017). The completion of all four stages of experiencing, reflecting, thinking, and acting provides a complete learning cycle by which learning can occur (Kolb & Kolb, 2005). However, in a study conducted by Shoulders & Myers, only 30% of teachers surveyed reported using all four stages of ELT to support learning within their classrooms (Shoulders & Myers, 2013).

In Louisiana, few teachers were implementing STEM content or lab assignments in their courses, and many expressed discomfort since they were relatively unfamiliar with conducting the labs themselves (Personal correspondence, Smith, H., 2019). To develop divergent knowledge, teachers should not only provide opportunities for students to grasp new knowledge but must also experience that knowledge actively (Knapp & Benton, 2006). With that in mind, [UNIVERSITY] developed a course focused on teaching scientific concepts, as well as encouraging hands-on participation in agriscience laboratories.

How It Works

The purpose of the Agriscience Applications course was to assist students in developing teaching strategies needed for teaching agriscience and STEM laboratories. The instructor provided lectures on agriscience content, including ways to implement content into school based agricultural education courses, followed by student engagement in a relevant laboratory assignment the subsequent class period. Students were also required to submit two laboratory reports on labs of their choice throughout the semester, which encouraged students to develop skills in scientific writing and communications that can be used to discuss scientific content with formal and non-formal audiences.

In Fall of 2020 and 2021, the course was offered as a special topics course for 6 students. In Fall of 2022, the course was expanded and offered as a full course with 12 students enrolled. In total, 12 scientific methods laboratories were offered as part of the course with content including scientific methods introduction laboratories, plant science laboratories, animal science laboratories, microbiology laboratories, and entomology laboratories.

In addition to required laboratory participation and laboratory reports, students were asked to complete an Agriscience Fair project for their final exam grade which included a scientific paper, a poster, and a presentation of their project. Students were instructed to follow the National FFA Agriscience Fair handbook when developing their projects, and the final project was graded using the National Agriscience Fair rubrics. Sections of the paper were due throughout the semester to allow students to get feedback on their writing which could then be applied to their final paper.

Results to Date

When asked about the impact of the class, students reported a highly favorable attitude about the course and the course content. Selected comments included:

"I loved this course and it created new passions for me to use in my classroom"
"A project heavy class that requires a lot of hands–on work but is a very fun class"
"I loved the opportunity to do an agriscience fair project. I never did this in high school but feel like I could have my students participate in it now."
"This class gave me a ton of ideas to use in my own classroom"

Future Plans/Advice to Others

The course will continue to be offered in alternating fall semesters to help support STEM integration for students at [UNIVERSITY] along with professional development trainings of the labs included in the course for in-service teachers. Additionally, follow-up data will be collected to determine if labs are being implemented once students begin teaching and if not, identify barriers to implementation.

Before beginning a similar course, universities should identify essential lab content that their teachers may be able to integrate as part of their state curriculum. In Louisiana a new curriculum and laboratory guide was recently developed for teachers that works in conjunction with state credentialing requirements. Therefore, lab assignments were designed to tie into that curriculum. Also, since school budgets vary, laboratories that are easy to run without extra equipment and with inexpensive materials, should be used primarily within this course to make the laboratories usable for the majority of teachers when they enter the classroom.

Cost/Resources Needed

The overall cost of the course is dependent on which labs are being conducted during the semester. Most labs are designed to use materials that can be found at a grocery store or obtained inexpensively through online supply companies such as Lab-aids or Carolina Biological. Ideally, the labs for this class should be ones that students can easily replicate in a classroom environment with a very low budget. In 2022, the course cost was $657 of which, the largest cost of materials for gel electrophoresis lab ($384). It is important to note that many of the higher costs associated with scientific labs are one-time costs for materials, equipment, or kits and that the cost of the classes is lower once you only need to purchase refills or perishable supplies from year to year.

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MOM Groups- Creating Social Presence in an Online Agricultural Leadership Course

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Background

During COVID when classes were moved to online formats, the impact of relationships between peers on learning was made clear (Baber, 2021). This idea stemmed from needing a way to foster relationships in online courses during COVID. A need exists to create meaningful, engaged learning in all environments (Roberts et al., 2016) and this idea strives to better engage learners who are taking a leadership course online. Social presence theory refers to the degree of prominence of others in an interaction and the importance of those resulting interpersonal relationships (Short et al., 1976) and has been found to have a positive relationship to learning outcomes for online courses (Tu & McIssac, 2002). It has been recommended that agricultural education eLearning course instructors design assignments that encourage social interaction between peers in order to increase their social presence and thus more positive learning outcomes in the course (Strong et al., 2012). This innovative idea sought to increase the social presence of students with their peers in an online agricultural leadership course. MOM stands for Meeting of the Minds and allows students to take an asynchronous class while still actively engaging with peers within that class. These groups allow students to meet with a learning community at a time that works best for them. This creates opportunities for students to have meaningful conversations about class content, while making connections with their classmates.

How It Works

The MOM groups were utilized in a five week summer session for a personal leadership education course. These learning communities consisted of three to four students each. Two days prior to class starting, the instructor sent a Google Sheet out via an email allowing students to pick which days and times would work best for them to have an online meeting through Zoom (or another online platform with similar functionality). After students responded, the instructor team sorted students into learning communities based on what times they were available to meet throughout the week. Students who did not respond to the survey were put in groups together, and encouraged to reach out to the instructor team if they could not find a meeting time that worked for every group member. Students were expected to meet 30-60 minutes every week. During these meetings they were provided with a list of prompts, referred to as Curiosity Q's, to help generate conversations about course content. The Curiosity Q's were structured in a way that encouraged students to connect to the course content as well as to their peers. Some sample questions are: *How balanced does your life feel right now? Any particular areas you need help with? What quadrant do you currently feel like you are living in with regards to life balance? Do your community members have any suggestions on strategies for balance for you?* After each meeting students had a discussion post that included both group submissions and individual submissions. The group submission included a summary of their group meeting, questions discussed, and a screenshot from their group meeting. The individual submission included an individual reflection of learning that occurred from the group meeting.

At the beginning of each meeting the groups assigned roles to delegate responsibilities for the group submission, and students were encouraged to rotate responsibilities. Roles consisted of: proof provider, summarizer, initiator, reminder, liaison. Students had the opportunity to request a teaching assistant join their meeting to answer any questions about

course content or assignments they had. At the end of the semester students presented individual presentations via Zoom within their learning communities and a member of the instructor team.

Results to Date

Based on student reflections about the MOM groups, many students expressed having a positive experience. According to one student, "The LC Meeting of the Minds was very impactful on my learning in this course because there were many times I was unsure about information and my LC would help me understand what the content was. The biggest challenge with the LC Meeting of the Minds was finding time in our busy weeks to meet, but they were fun and they served as a reminder that we all have the same time struggles."

Although most students expressed an overall positive experience, the instructor team acknowledges that not all students enjoyed the MOM groups. However, based on student feedback, some students who did not enjoy the meetings acknowledged they gained something from them. This student stated, "Also, like everyone else in my group, I utilize summer to work as much as possible to save for the fall and spring when working is more challenging, so scheduling was a significant conflict for us since most of the time, we are working. However, that being said, having a designated group of people that I have been in contact with and worked with all summer consistently has been primarily positive, as we can help each other remember when assignments are due, figure out how [*sic*] instructions together, and help each other find resources needed for the class."

Advice to Others

We recommend collecting input from students as early as possible (even prior to the course beginning) about their general availability prior to creating the learning communities as this will better ensure they are able to find a time to meet. We also recommend creating authentic questions (Curiosity Q's) that the MOM groups can discuss at each meeting. These questions help spark conversation about the course topics as well as the assignments in the course. The questions should be worded in a way that encourages metacognition at the community level as well as the individual level.

Overall the biggest complaint or thing students found challenging was finding time to meet. This could possibly be fixed by reinforcing the requirement of a weekly meeting in the syllabus and by discussing with students early in the semester about how previous students benefited from the MOM groups.

We are engaged in design-based research which analyzes data to find problems, and then designs and implements solutions in order to maximize this experience for students. To date, we have implemented the MOM groups in two separate summer semesters. Thus far, our research indicates that MOM groups may be fostering learning outside the group more than within.

Resources Needed

The main resource needed for this project is time. There must be time to create and send out the spreadsheet, as well as analyzing the spreadsheet once it is filled out to create the groups. It also takes time to create the curiosity Q's to help guide the groups in their discussions. No additional funding is required for this project.

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Multilevel Modeling: Foundations and Opportunities in Agricultural Communications, Education, and Extension

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Introduction

People function within social contexts where they are part of a hierarchical system, nested within groups (Kwok, 2022a), and the system can be observed at different hierarchical levels. For example, students are nested within schools, farmers are nested within formal and informal associations, and consumers are nested within countries. Repeated measures in a longitudinal study are also considered a nested data structure because multiple observations are nested within individuals (Peugh, 2010). Multilevel modeling (MLM) allows researchers to preserve the hierarchical population structure itself in the analysis (Goldstein, 1991). The term *multilevel* "refers to the random variables in the model which are defined as varying between units at different levels of the hierarchy" (Goldstein, 2021). Therefore, researchers would use a two-level model if, for example, there was random variation between students (level 1) and between schools (level 2; Goldstein, 2021). MLM was developed to extend regression modeling. Traditional multiple regression techniques only allow researchers to model variable variance at one unit of analysis (e.g., student level or school level, but not both; Peugh, 2010). Kwok (2022a) explained three reasons why researchers need multilevel analysis techniques: 1) To obtain correct standard error estimates of model parameters; 2) to allow variables (or predictors) at different hierarchical levels to be included in the same model; and 3) to determine how relationships between level 1 (e.g., student level) variables vary across level 2 (e.g., school level) variables and what level 2 (e.g., school level) variables can explain variation in the dependent variable. After searching the *Journal of Applied Communications* and the *Journal of Agricultural Education*—the designated journals for agricultural communications and education research—we found no studies that used MLM. Because research conducted by scholars in the discipline often lends to nested data, we believe MLM provides a rigorous approach to analyzing the data through a novel lens.

How It Works

Usually, researchers pose research questions focusing primarily on a level 1 (e.g., student level) variable, a level 2 (e.g., school level) variable, or an interaction between variables (Peugh, 2010). MLM can be conducted when independent variables are continuous or categorical. Dependent variables can also be continuous or categorical; however, we limit our explanation of this analysis method to datasets with continuous dependent variables because additional complexities are involved when the dependent variable is categorical. Basic requirements associated with MLM include a clear grouping criterion (i.e., each level 1 variable should have a clear group membership to a level 2 variable), and variables should be unequivocally assigned to one level (Kwok, 2022a). The four basic models include the random intercept model, the means-as-outcomes model, the random coefficients model, and the intercept- and slopes-as-outcomes model (Kwok, 2022b). To fit a model, researchers tend to start with the random intercept model, also considered the baseline model, to determine how much variance is at each level (Centre for Multilevel Modeling, n.d.; Kwok & Chang, 2022). Results from a random intercept model also allow researchers to calculate the intra-class correlation, which is the proportion of variance explained in the dependent variable attributable to the level 2 variable (Kwok, 2022c; Stawski, 2013). After fitting the random intercept model and calculating the intra-class correlation, the next step or model involves adding the predictor(s). The appropriate model is determined based on the research question. For example, researchers would fit a means-as-outcomes model if they sought to explain the variance in the dependent variable as a function of a level 2 predictor, or they would fit a random coefficients model if they sought to explain the variance in the

dependent variable as a function of a level 1 predictor (Lee & Sbarra, 2010). Of course, there are other important considerations researchers must address when conducting MLM (e.g., choosing an estimation method, centering continuous predictors).

Results to Date

We used MLM to determine how gender affected critical thinking style scores between agricultural students in the U.S. and China. Critical thinking style was measured using the University of Florida Critical Thinking Inventory (Lamm, 2015). We collected online survey data from Texas Tech University students in the U.S. (n = 104) and Hebei Agricultural University students in China (n = 103). Most U.S. students identified as female (64.4%) and most Chinese students identified as male (67%). Students were nested within two countries—the U.S. and China. We first fit a random intercept model with *critical thinking style* as the dependent variable and no predictor. The mean of *critical thinking style score* was 79.27 and statistically significantly different from zero ($p < .001$). The between country variance was 1.73 and the within country variance was 25.07. Country accounted for 6.4% of the variance in students' critical thinking style scores. We then fit a random coefficients model with *critical thinking style* as the dependent variable and *gender* as the predictor. The mean critical thinking style score was .64 lower for female students compared to males students ($t(206) = -0.82$, $p = .414$). Only .16% of the variance in students' critical thinking style scores between countries could be accounted for by adding *gender* to the model, which could be because students were nested within a small number of groups. These results indicate gender does not influence the variation between U.S. and Chinese agricultural students' critical thinking style scores.

Advice to Others

We believe there are significant opportunities for scholars to use MLM in agricultural communications, education, and Extension research contexts. For example, agricultural communications scholars may be interested in investigating how consumers' trust in the agricultural industry (level 1 variable; predictor) influences their frequency of purchasing locally produced food (dependent variable). By collecting data from consumers in various states (level 2 variable), they could fit a random coefficients model (since the predictor is at the level 1) to determine the amount of variation in the relationship between trust in the agricultural industry and purchasing frequency across states. As another example, Extension services use programming to support farmers with their mental health and stress levels. Therefore, agricultural Extension scholars may be interested in exploring how environmental risk factors (level 2 variable; predictor) influence farmers' willingness to participate in mental health programming (dependent variable). If data are collected from farmers in various agricultural production sectors (level 2 variable), it could be analyzed using a means-as-outcomes model (since the predictor is at the level 2) to determine if there is a significant difference between farmers' willingness to participate in mental health programming between production sectors.

Costs & Resources Needed

The only resource, and associated cost, required to conduct MLM is a general purpose statistical software (e.g., Stata, SAS, SPSS, R). For our applications of MLM, we use Stata.

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Preservice Teachers use of PLC's During Their Student-Teaching Experience

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PRESERVICE TEACHERS USE OF PROFESSIONAL LEARNING COMMUNITIES DURING THEIR STUDENT-TEACHING EXPERIENCE

Introduction/need for innovation or idea

There is an increasing importance of professional development for teachers. For preservice teachers learning to be professionals in education, the role of professional development reinforces the role of professionalism. One of the most critical components of being a preservice teacher is building a professional identity in a K-12 school. Professional teachers are actively engaged in their schools, and one example of their engagement is in professional learning communities (PLC). A PLC is a group of people sharing and interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, growth-promoting way (Mitchell & Sackney, 2000; Toole & Louis, 2002).

The [State] Educator Accomplished Practices (EAPs) are [State]'s standards for effective teaching. While providing guidance to teachers, they also provide a framework for evaluation of teaching ([State] Department of Education, N.D.). University supervisors at the [University] noticed an opportunity to enhance continuous professional development of preservice teachers. Specifically, the EAPs say, "the effective educator consistently examines and uses data-informed research to improve instruction and student achievement." [University] agriculture preservice teachers meet for reflection throughout the student-teaching semester, but it was felt that the time together could be more purposeful.

Previous research has shown that professional development that focuses on content knowledge and allows teachers to be a part of active and collaborative learning has been shown to provide changes in teacher knowledge and practice. (Birman et al., 2000, Desimone et al. 2002, Desimone 2009, 2011, Garet et al. 2001).

Preservice teachers have an expectation to meet throughout their student-teaching semester, and the idea to turn those meetings into a PLC was put into practice during the Spring 2022 semester. The Preservice teachers used this time to build their content knowledge, share ideas relating to classroom management, and develop relationships with fellow preservice teachers.

How it works/methodology/program phases/steps

Four PLC meetings were held throughout the were held the student teaching semester. The first meeting provided an introduction to the process before student teaching, then the preservice teachers participated in the PLC throughout their student teaching experience. Preservice teachers were given a topic to discuss during their PLC's. They were expected to set measurable goals for student learning and were expected to collect data to measure their progress. Upon completion of student-teaching, preservice teachers shared their data and reported the findings from the semester.
Preservice teachers were grouped initially based on the level they were teaching. There were three groups; middle school, foundations, and upper level. Once students were grouped, each group was provided with a topic related to a teaching practice. Middle school preservice teachers discussed formative assessment. Foundations preservice teachers discussed motivating students to learn. Upper level preservice teachers discussed problem-based learning.

Results to date/implications

Overall preservice teachers felt having a PLC to participate in "was a great opportunity to work with their peers for a common goal." Another preservice teacher said:

> "I think going through the process of the PLC is really going to help me so that when I get into a school and I begin a PLC I'm not that naive first year teacher, like I'm going to understand what's going on."

Preservice teachers stated one of the most prevalent strengths of this innovation was learning what a PLC was and how to work with others in their professional teaching career. Students also remarked on how the PLC helped with their knowledge of formative assessment. Preservice teachers spent time answering questions such as why formative assessment is important and how to implement it into their classes.

Participants had multiple thoughts about their PLC. One participant said the PLC "gives me some different ideas that I didn't necessarily even have in my brain before this." Another participant said, "we could exchange ideas and frustrations." The PLC allowed students to share experiences with those in similar situations and helped them feel like they were not alone and having similar experiences. Another participant said the PLC "made me talk to people about teaching in a professional way". Another participant learned about teaching strategies and other things to impact their classroom teaching.

Future plans/advice to others

While the reception of this innovation was positive, there are some areas that should be adjusted when implemented next time. Making the PLC an integral part of the student-teaching experience could help with buy-in. One solution that could help with integration is grading the PLC involvement. One preservice teacher remarked "her buy-in could have been higher, but because the PLC was not tied to her grade it made it more difficult."

One preservice teacher remarked "having expectations for topics you'd want these PLC's to be based on would be valuable." Ensuring topics are thoughtful and worth the time spent discussing is especially important for this process.

Costs/resources needed

While there was no direct cost in doing the PLC's, there was a need for time and travel for the supervisor. Time was spent developing the PLC group, questions, and securing a location for the group meeting. There was also time spent traveling to and from the PLC location.

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Staying Informed: Using Student Reflections As Teaching Tools

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Introduction/Need for Innovation

Students engage in experiential learning during the process of website design and development. Kolb (1984) identified four abilities learners must use to be effective. These abilities included learners engaging in new experiences, reflecting on their experiences, integrating their reflected observations, and applying them to decision making or problem solving directly connected to the learning experience (Kolb, 1984). Harder et al. (2021) identified experiential learning theory as common across all specialization areas. Student reflection related to the experiential learning cycle has received much attention, but little is available about using student reflections as part of an educator's experiential learning process. The closest term to yield results related to teacher learning was "student feedback" which included studies and the implications of end of semester formal university feedback mechanisms.

Thus, this project engaged students in experiential learning and used student's written reflections to allow the instructor and teaching assistants to engage in the learning cycle as well. This occurred as the students provided written reflections which called on the instructor and teaching assistants to engage concrete experience abilities as they engaged fully with each student's project. Reflective observation occurred during weekly meetings where the instructor and teaching assistants reviewed student reflections and discussed all of the possible options for addressing student needs. The team brainstormed options for curriculum and instructions and direct solutions for students. Finally, they employed their solutions to improve student learning outcomes through the generation of resources to support student learning.

How it works

Students were instructed on how to design and develop websites as part of a combined section course of graduate and undergraduate students. The only prerequisite was a sophomore level computer applications course, and students from various majors were enrolled. Students had varying levels of knowledge and experiences based on their responses to a questionnaire completed on the first day of classes. Thus, the course content had to be tailored to meet students where they were at in terms of skill level and basic knowledge of websites. The course enrollment was 33 total students.

Due to the technical nature of website design and development, feedback was collected through reflections throughout the instructional process. Moreover, students were required to incorporate basic website elements, but their website topics ranged from a professional online portfolio site, e-commerce/business site developed for someone, or a site about a topic of interest to them. Additionally, students were allowed to select a content management system (CMS) platform that best met their website goals. Thus, the goals and needs of students were varied.

The instructor and two teaching assistants met weekly to overview upcoming content and develop reflection questions. Each reflection included questions about course content like accessibility or design considerations as well as a question about topics in which students needed clarification (i.e. usability testing), or topics of interest for adding to their knowledge base (i.e. html coding practice). Feedback received through the reflections was used to review topics at the start of each class and develop resources for students. It even allowed one-on-one attention for students who wanted to pursue more advanced website goals. The graduate assistants and instructor located resources after each reflection and made them available for all students. This created an improvement over previous semesters when the instructor provided generic and overarching resources due to time limitations.

Results To Date

The reflections provided three key positive outcomes. First, instruction was improved by collecting and reviewing the reflections after each class. It allowed each student, not just those willing to email the instructor, a channel to express needed support or input. For example, "I would like to learn a bit more about how servers work and how these websites run off different servers." Another student shared, "I am interested in coding, but since we don't need it for this course, could you direct me toward more resources [where] I could learn more?" Second, the instructor noted students were more engaged in the lecture based-content because they knew they had to reflect on class concepts from lectures and demonstrations. Using the reflections provided a way to assess learning without having extra grading from quizzes. Third, students were more independent in their work compared to previous semesters because they had plenty of resources to support their interests and meet assignment requirements. One example of this came from feedback about their confidence levels learning a CMS without direct in-class instruction. One student stated, "I feel 75% confident about my knowledge of designing a website with my content management system. I also appreciated that [instructor] provided videos to learn more about the CMS platforms available for students." Another student expressed, "I might not be learning it directly from my teacher but its not like I was told go learn about CMS without further instruction or resources."

Future Plans/Advice to Others

The instructor will continue to use reflections to collect feedback from students for complex instructional content, regardless of teaching assistant support, at the end of each class. It made the process of supporting student learning more manageable compared to previous semesters when students emailed questions independently between class meetings. Instead of soliciting the class for questions at the start of the following lesson, the instructor was able to build additional instructional content and add it to the course learning platform which decreased the number of students who asked the same questions independently. It is recommended to build in time immediately after each class to review the reflections, so you have adequate time to identify and deploy resources via your instructional platform or develop instructional content prior to the next class meeting. This also provided student with timely support and prevented them from being stuck on a step for several days. Additionally, this provided immediate feedback for improved instruction.

Costs/ Resources Needed

This innovation required no financial costs due to the use of electronic reflection forms. Additionally, the campus has a subscription to Lynda by LinkedIn. It was a resource for supplemental instructional content, so exploring availability through your campus is recommended. The instructor has traditionally taught the course without any teaching assistant support, but was able to utilize two teaching assistants. Having at least one teaching assistant to assist with compiling and posting resources is immensely helpful and improves efficiency for providing the needed resources.

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The Compost Learning Laboratory: A Laboratory for Experiential Learning and Informal Teaching of Solid Waste Management to Adult Learners.

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The Compost Learning Laboratory: A Laboratory for Experiential Learning and Informal Teaching of Solid Waste Management to Adult Learners.

Introduction/Need for Innovation

Food and landscape waste makes up the largest material in municipal waste streams in the United States (U.S.) and this has negative environmental, social, and economic impacts (Pai et al, 2019). The U.S. Environmental Protection Agency (US EPA) says that food waste is responsible for a significant portion of the methane emissions generated by landfills and it poses a threat to ground and surface water resources (US EPA, 2018). The reduction of compostable waste entering our waste stream has been ranked as one of the top solutions for reducing the impacts of climate change (Hawken, 2017). However, there is a general lack of knowledge among the public about waste prevention and diversion, especially at the home and community levels (Thyberg & Tonjes, 2016). Across the United States, local and state governments are identifying waste reduction opportunities and educational programs to engage communities in waste reduction (Levis et al, 2010). These opportunities sometimes include composting, which is utilized as a tool for extending the life span of landfills through the reduction of food scraps, yard trimmings, and other organic materials entering the waste stream (Tedrow, 2018). Cooperative Extension professionals can play a significant role in addressing community waste management problems by targeting composting education (May, 1994). Oklahoma State University (OSU) Extension, through its Master Composter program and partnership with the Oklahoma City Parks and Recreation Department, has addressed the need for community composting.

Rooted in Experiential Learning Theory (Kolb, 2014), the Master Composter program has been offered by Extension professionals in Oklahoma City since 2019 to engage adult learners in environmental education through hands-on experiences. During this time, more than 100 participants have completed the 6-week training course which provides 24 hours of classroom and hands-on instruction. In addition, the establishment of a Compost Learning Laboratory for compost education has served as an experiential learning site for adult learners to engage with different composting methods. This program has helped create awareness of composting and solid waste management issues and equipped participants with the first-hand experiences needed to have success with solid-waste management efforts in their community.

How It Works

Extension professionals partnered with the City of Oklahoma City to develop a composting site at the park for composting park waste, and to serve as an experiential learning laboratory for the Master Composter program, and others interested in learning to compost. The OSU Extension Compost Lab serves as a community education space for composting and small-scale waste management education. Will Rogers Gardens is uniquely positioned to serve as the location for this project. Will Rogers Gardens hosts more than 300,000 annual visitors to the park and in cooperation with OSU University Extension delivers dozens of educational programs for the community each year. The OSU Compost Lab project is a collaborative effort between OSU Extension and the City of Oklahoma City Parks and Recreation Department, modeling what is possible in other community spaces and spurring interest in community composting.

Results/Implications

Pre-test and post-test data has been collected from the program since its inception. While the researchers recognize the problems of reliability associated with pre/post evaluations

(Marsden & Torgerson, 2012), over 100 evaluations have been collected over the four-year period and appear to indicate a strong impact. The most notable, are the increased confidence expressed by participants in their ability to successfully compost and to teach others about composting and waste management. 98% of participants expressed greater confidence in their ability to compost at home and 92% expressed increased confidence in their confidence to share composting knowledge with others. One participant expressed, "*I was unsure about my knowledge of composting before, but this class has given me the confidence to compost at home and to share my knowledge with others.*"

Before the establishment of the Compost Learning Laboratory, most landscape waste from the park was put into the waste stream. This project has expanded the capacity for waste reduction and composting of plant clippings at Will Rogers Gardens and allowed for an outlet for a food bank nearby the park to recycle fresh produce waste that would otherwise be sent to the landfill. The partnership between OSU Extension and the City of Oklahoma City Parks and Recreation Department has also led to increased volunteerism with approximately 20 Master Composters serving at Will Rogers Gardens and contributing 40 volunteer hours each week. In addition, Will Rogers Gardens through its partnership with OSU Extension provides, composting, and related educational programs to hundreds of Oklahoma City area residents each year. This partnership has resulted in numerous composting educational events for the public reaching an estimated 500 participants annually. This project is an example of what can be accomplished through strong partnerships. Extension systems can partner with municipal governments and community agencies in ways that are mutually beneficial. The hope is that the success of this small project leads to larger-scale waste reduction efforts in Oklahoma City, which consistently ranks among the worst major cities for composting and recycling (Moses, 2005).

Future Plans/Advice to Others

Food and landscape waste is an emerging global issue that impacts all aspects of communities and the food system (McCoy, 2019). Reducing waste is an important sustainability strategy for many communities and community composting can be an effective tool for reducing waste and educating the public (Tedrow, 2018). Extension professionals looking to provide innovative environmental education opportunities for their clientele may consider community composting education projects such as the Master Composter Program and Compost Learning Laboratory as models for their own programming.

Cost/Resources Needed

This project was made possible because of the strong partnership between OSU Extension and the City of Oklahoma City Parks and Recreation Department. The City of Oklahoma City and OSU Extension allocated staff time for the project and the City of Oklahoma City Parks and Recreation Department made space available at Will Rogers Gardens for the project. $26,803.96 was awarded to OSU Extension from the Oklahoma Department of Environmental Quality and was utilized to purchase small-scale composting and processing equipment, including a material pulverizer to process bulk material and a sifting machine to sift finished compost for utilization around park grounds.

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The Growth in Leadership Skills and Development of Fellowship through Literacy.

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The Growth in Leadership Skills and Development of Fellowship through Literacy.

Introduction/Need for Innovation

There is an ever-growing need for leadership in the agricultural industry. While these skills are usually honed during high school programs, such as athletics, 4-H, and FFA, there is an even larger need for these skills at the collegiate level. Layfield et al. (2000) found significant growth in leadership skills among students involved in leadership organizations in their collegiate experience.

Within North Carolina State University, rural students make up 34% of the population. With the majority of these students wanting to pursue leadership-based careers and eventually return to their rural communities, program leaders undertook the task of creating an environment for these students to grow as leaders among members of other rural communities. The Rurally Engaged Agricultural Leaders (REAL) program was created to provide students with an opportunity to further develop their personal and civic leadership skills while addressing agricultural and rural issues impacting their state and communities. In addition, students complete an Extension experience to better understand the role of Extension in agriculture and rural areas. It was the hope of the program leaders to provide rural students with a group to which they can belong. Rural students often struggle to find community at larger institutions due to the large populations or universities being the same size as the communities they are from, causing feelings of disconnect or lack of community.

To accompany program sessions, students participate in small group book clubs where they dive deeper into topics of leadership and rural issues. The books included: "The Truth About Leadership" and "Rural People and Communities in the 21st Century". The book club sessions were led by the program's graduate assistant, who met with the book club groups twice a month and facilitated the conversations.

How it Works

The students applied to the REAL program and were selected based on their applications. Students were required to be from rural communities and enrolled in an agricultural-related degree program. Within the applications, students shared their rural community/county, career interests, college department, and potential goals they hoped to accomplish through participating in the program. The applications were then evaluated by program faculty, Extension agents, and community stakeholders, and twelve participants were selected.

Program directors selected the books, with one focused on leadership and one addressing rural communities. Focusing on one book per semester, participants completed the assigned readings and were guided by reflection questions developed by the program graduate assistant. Twice a month, participants were expected to complete the readings and encouraged to use the questions to learn more about themselves as leaders and relate the readings to their leadership development and rural communities. The students meet every other Friday and select five questions from the list to discuss within their small book club groups. The book club facilitator was responsible for assigning readings, providing pre-questions about the readings, and directing the discussion at the club meetings. As facilitators, it was their responsibility to help the students dig deeper into the understanding of the book concepts and further develop reflection questions to help them grow as individuals. Students were also encouraged to use the readings as support for the program field trips. The book club facilitator was able to help students understand the connections between the books and the leaders they met during field trips. In addition, the

readings served as a guide to develop questions to ask guest speakers and those agricultural leaders they met with during the program.

Results to Date

To date, the book club has brought 20 students, from first-year students to doctoral students at North Carolina State University, together to learn about leadership and agriculture and partake in fellowship. These students vary in major, agricultural experience, and future career goals. However, when brought together, the students create discussion from personal experience with respect and integrity. They are able to learn about others' opinions of leadership and agriculture, therefore helping them to grow as individuals. When asked what they have received from the book club, one student stated, "I have gotten a better understanding of what it means to be a true leader and the very important aspects of a leader. I have also gotten to know the people in the program. We all come from different parts of the state, yet we are connected through the world of agriculture." While another student stated, "I feel like the book club meetings have really impacted my leadership qualities personally because of how much I have gained from them. One important leadership quality that the book club has impacted me would be listening. While everyone is sharing their answers to the questions each week, I get to improve my active listening skills. I feel like the course of the months of being in this has helped me carry this into my daily life conversations with friends and family. I just recently got a compliment from a friend for being such a good active listener. I felt like it was so much more than a compliment because I have been able to grow in this area where I once wasn't as strong."

Future Plans/Advice to Others

In the future, we plan to incorporate partners for book club sessions to promote further networking and relationship-building among the REAL cohort. For the partner sessions, the students will grab lunch or coffee and discuss questions provided by the book club facilitator. Then at the larger book club session, students are able to share their partner discussions with greater context. This is suggested to help them improve their leadership ability and keep each other in check and create more profound discussions surrounding their home communities and personal leadership experiences. Research supports that fellowship among students promotes success and establishing community; therefore, by allowing the students to create these friendships, they are more likely to thrive in an environment which they are not familiar with.

We strongly suggest that those interested in establishing book club programs select books relatable to participants. The books selected for our book club have scenarios and situations that college students could relate to, which aided in generating conversation. Also, participants enjoyed having pre-questions to guide their readings. These pre-questions also assisted students in their participation.

Cost/Resources Needed

To support the REAL book club, program leaders paid for the books. "The Truth About Leadership" costs $13.98 per book, and "Rural People and Communities in the 21st Century" costs $29.95 per book. Books were provided for each participant, the program leader, and the graduate program assistant. The REAL program was created through grant funding which supported a graduate assistant. The graduate assistant who leads the book clubs and assists with the overall program is paid through this grant.

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The of Use Challenge Coins to Address Teenage Mental Health Among Secondary Agriculture Youth

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The of Use Challenge Coins to Address Teenage Mental Health Among Secondary Agriculture Youth

Introduction

Mental health is a growing concern within the agricultural industry (CDC, 2020). As farmer suicide rates continue to rise (CDC, 2020), conversations on the topic become more important. As a major industry group, Agriculture, Forestry, Fishing, and Hunting is the fourth highest in suicide (2020). In addition, 84% of the group's overall population is comprised of farmers (Reed & Claunch, 2020). Suicide is not only rising within agriculture, but among today's youth as well. Between the ages of 15 and 24, suicide rose to an alarming 14.2% per 100,000 in 2020 (CDC, 2022). That is 6,062 young adults who took their life that year (CDC, 2022).

The branches of the military have a special way to recognize their soldiers through a process called *Challenge Coins*. Although it is unknown when the military challenge coins were originated, historians note the use as far back as the First World War (Bledsoe, 2022). The coin started as a method to represent the branches, units, groups or a specific mission. Today, they are used to express appreciation or thanks to a recipient (Mahoney, 2010). The coins serve as a way to keep members connected and build meaningful bonds that last a lifetime. Each challenge coin is accompanied with a "secret" handshake. The purpose of this handshake is to be quiet and discreet, not to draw attention since this is an intimate award. The commander is to walk up, shake the recipient's hand, place the small coin in the palm, and the ceremony is over (Rodriguez, 2022). Often there is a saying or short speech to go along with the ceremony.

Although the military initiated the challenge coin, many organizations have adopted the concept. Firefighter associations and police accompanies have established their own version, commonly called *first responders challenge coins* (Bledsoe, 2022). Now industries are creating their own challenge coin. They can be used as branding, to feel connected to the business. Organizations may create their own coin to give to their strongest supporters and to show their appreciation.

How it works/Methodology

In an effort to acknowledge the mental health concerns among agricultural youth, <u>STATE</u> created an agriculture mental health challenge coin. The coins are a pocket-sized, circular coin. The front of the coin is stamped with the information about the organization while the back

contains the state's suicide hotline. The purpose of the coin is to create opportunities for individuals to express to the recipient how appreciated they are and that their life is valued. The coin is to be passed out to an individual that may be going through a rough time, contemplating/contemplated suicide, or someone that has been touched by suicide in some way. Each passing of the coin is presented with a handshake. Like the military coins, it should be as quite and discreet as possible (Rodriquez, 2022). The handshake is paired with a speech to stress to the recipient their life is valued, and they are appreciated.

In order to give a coin, one must participate in a QPR (Question, Persuade& Refer), a suicide prevention training offered in <u>STATE</u>. The intent of the QPR training program is to improve knowledge of suicide; the ability to identify people in distress and gain confidence; and comfort to intervene when needed (CAFE, n.d.) You will not be able to find the coins on the table at a trade show or in a swag bag. They are intended to only be delivered to individuals who can make a difference or who may be considered in need. Not until a handshake and a face-to-face private conversation occurs, the agriculture mental health challenge coin is not complete.

Results to date/Implications

Since its release in 2021, the agriculture mental health challenge coin has expanded. So far, approximately 1,600 challenge coins are in rotation around the state. In addition, five FFA chapters and five non-profit organizations have created their own coin, with three more in production. To date, 110 coins, handshakes and personal conversations have occurred among the agricultural education community. Recently, agriculture teachers received the opportunity to attend QPR training during the annual teacher's conference and students were able to receive in 2022 during their attendance at FFA Camp. After attending a QPR training, each teacher and/or student receive three coins to hand over to someone who may need it.

A few months later, a group gathered to reflect on the process of agriculture mental health challenge coin. Discussion allowed for the participants to discuss their nervous tendencies, the conversation that occurred, and future approaches. After the reflection, each individual received two more coins, pending their need. One chapter created the slogan, *five for life*, representing the five lives each student potentially saved.

Future Plans/Advice to Others

Future plan is to expand the agriculture mental health challenge coin program into more high schools across STATE. Six more FFA Chapters have agreed to receive training and students have begun to develop their own chapter coin. Also, the agricultural education program at the University of STATE is designing their own coin and scheduled QPR trainings to assist agriculture students around campus. Agricultural Education students will participate in the QPR Training and receive their own set of coins to distribute to their peers and hometown community. The students will monitor the progression of the challenge coin.

Cost/Resources Needed

For the entirety of the agriculture mental health challenge coin, financial resources are needed for the production of the coin and the QPR training of each individual. Each coin costs between $3-$5 to produce based upon the size and color needs. In addition, the required QPR training is $249 per person. In STATE, all coins and QPR Training is paid for through a partnership among the Southeast Center for Agricultural Health and Injury Prevention; the Central Appalachia Regional Education and Research Center; and Agrisafe.

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Tools for Another Time: Using a Weekend Course to Build Teacher Efficacy in Training Career Development Events in School-Based Agricultural Education

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Tools for Another Time: Using a Weekend Course to Build Teacher Efficacy in Training Career Development Events in School-Based Agricultural Education

Introduction/Need for Innovation

"Learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 38). The need for this innovation arose when a doctoral student at Oklahoma State University (OSU) recognized the need for preservice school-based agricultural education (SBAE) teachers to put the theory behind the training of Career Development Events (CDEs) in SBAE, gained in prior teacher preparation courses, into practice. This idea supports Kolb's (1984) assertion that learning occurs as learners partake in experiences resulting in the transformation of their understanding. In addition to the perceived need for the innovation, Harris (2008) identified the preparation of CDE teams as one of the main areas of teacher interest for professional development. Garton and Chung (1996) reported preparing FFA teams was a perceived need of professional development by in-service teachers. Additionally, they identified many teachers identified a two-to-three-hour workshop as their preferred delivery method for training, supporting the development of a short course. This innovation aligns with Research Priority 5: Efficient and Effective Agricultural Education Programs (Rogers et al., 2016).

Agricultural education can be defined as the instruction of agriculture, food, fiber, and natural resources to elementary through adult learners with the purpose of preparing them for agricultural occupations, entrepreneurship, and increasing their agricultural literacy (Phipps et al., 2008). CDEs provide this intracurricular opportunity for students to apply the knowledge gained in agricultural education courses to a career context related to their interest and develop college and career readiness skills (National FFA Organization, 2022; Phipps et al. 2008). The Three-Circle Model of Agricultural Education includes: Classroom/laboratory instruction, Supervised Agricultural Experiences (SAE), and student leadership development through the National FFA Organization (Phipps et al., 2008). Successful and effective implementation of this model creates strong programs with the ability to produce individuals capable of becoming leaders in the agriculture industry (National Association of Agricultural Educators, 2022).

How it Works

A one-credit hour weekend short course was developed at OSU. The goals and objectives of *Training Career Development Events in School-Based Agricultural Education* reflected the purpose of CDEs and highlighted examples of training resources and experiences related to the implementation of CDEs. The 12 students enrolled in the course were sophomore and junior agricultural education majors at OSU. The course occurred over the span of three days and included classroom instruction, small group activities, a self-guided CDE resource module, and site visits. Classroom instruction was used to introduce the purpose of CDEs in SBAE and how they can be implemented into courses in Oklahoma agricultural education. In small groups, students created presentations outlining different CDEs. An online *Canvas* module was created to guide students through various online resources for CDE training. Students participated in five site visits throughout the course designed to introduce community resources that may be available to SBAE teachers for training CDE teams. The site visits included: Walmart, Atwood's, Lowes, a local nursery, and the OSU Botanical gardens.

Objectives for the course included: (1) Identify the purpose of CDEs in SBAE, (2) Identify how to implement CDEs in the classroom, (3) Discuss the ethics of CDE team selection, (4) Identify training resources for CDEs in Oklahoma, (5) Develop a training timeline for a CDE, (6) Create training resources, and (7) Locate training opportunities in the community (Price, 2022). Students completed a variety of assignments including CDE team presentations featuring the connection of the CDE to courses taught in Oklahoma, a CDE training timeline to implement in their future program, a site visit reflection, CDE identification photograph submissions, CDE resources worksheet, and a reflective essay. With student permission, resources created throughout the course including the team presentations, training timelines, and identification photos were shared with all students to be used in their future programs.

Results/Implications

When asked to reflect on their experience in the course through site visit reflections and reflective essays, students affirmed their appreciation for the class, the resources gathered, and the knowledge gained. In reference to the course, one student stated: "This class has further opened my eyes into how FFA is setting students up for the real world." Another student offered: "After having taken this class, I understand the importance of needing to invest time in teaching what CDEs are and why we participate in them." When reflecting on the resources gathered throughout the course, one student shared: "There are so many more ways to train a team than just looking at pictures in the classroom and taking practice test." These results align with Harris (2008) regarding the need for more training in preparing preservice teachers for CDEs. When looking back on the knowledge gained from the course, one student reported: "I developed a new realization; career development events teach you valuable life skills." Another student reiterated the importance of tying CDEs to classroom instruction when they stated: "My new understanding of CDEs is that they should be used as a continuation of content being taught in the classroom." This is supported by Phipps et al. (2008) and the integration of the three-circle model of agricultural education. Results of the innovation supported Kolb's (1984) views regarding experiential learning.

Advice to Others/Resources Needed

This course offering was born out of the desire to provide preservice SBAE teachers the opportunity to put theory into practice. Teacher preparation programs working to prepare SBAE teachers are encouraged to promote teaching opportunities to doctoral students with SBAE experiences. This innovation can be applied to other areas of preparing SBAE teachers e.g., preparing proficiency applications, writing speeches, supervising Supervised Agricultural Experience projects, and more. Teacher educators should identify the needs and interests of their preservice SBAE teachers and determine if the short-course approach could meet student needs. Resources included a syllabus, course description and proposal, a learning management system for course material distribution, a university vehicle for transport of students to site visits, and all necessary PowerPoints and videos needed to deliver the content of the course. Students incurred a university fee of $75 associated with a 1-credit hour short course. The only other cost associated with the innovation was the opportunity cost (time) associated with the planning, development, and delivery of the course by the instructor.

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Using a Cognitive Apprenticeship Approach to Prepare Successful Grant Writers

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Introduction

Based on anecdotal evidence from colleagues across the discipline and more than 10 years of experience as research-focused faculty, we know that graduate students in agricultural communications, education, and leadership rarely graduate with grant writing experience. This training gap is problematic considering the importance hiring institutions place on grant funding. The potential benefits of this training include master's students being more equipped to apply for dissertation funding should they choose to pursue a doctoral degree and doctoral students being more prepared for research-intensive faculty positions that require success acquiring extramural funding. Many academic position announcements released in the last few years have a 50% (or greater) research appointment, even those hiring at the rank of assistant professor, with the expectation that the candidate has demonstrated the ability or potential to secure extramural funding. To achieve this and be competitive for these positions, graduating doctoral students today need to show evidence that they have applied for graduate-level grants or contributed significantly to developing a federal grant proposal. Graduate students who are interested in pursuing industry careers can also benefit from active grant writing experience because it is a unique skillset that increases their employability.

How It Works

During the summer and fall semester, we (Science Communications Lab faculty) mentored junior scholars (e.g., doctoral, postdoctoral) through the grant writing process. Although we have previously involved junior scholars in grant writing by allocating certain tasks to them (e.g., developing a logic model, drafting support letters), the described experience was different because we developed a grant proposal specifically for the purpose of providing them with the full experience—from project ideation to proposal submission. To mentor them through the grant writing process, we used a cognitive apprenticeship approach. Through this approach, we enculturated them "into authentic practices through activity and social interaction, which help them pick up relevant jargon, imitate expert behaviors, and gradually start to act in accordance with disciplinary norms" (Brown et al., 1989; Ding, 2008, p. 5). Cognitive apprenticeship is largely associated with the work of Vygotsky (1978), who categorizes skills into three areas. The first category includes skills that the scholars can perform independently; the second category includes skills that scholars cannot perform, even with help; and the third category includes skills that scholars can perform but with help. The third category is referred to as the zone of proximal development, or "the domain in which learners are ready to grow through active and sustained support from experts or more advanced learners" (Ding, 2008, p. 5; Vygotsky, 1978). In the zone of proximal development, collaboration and interaction are necessary for learning to occur (Vygotsky, 1978).

We successfully implemented a cognitive apprenticeship approach to grant writing mentorship through a structured process of modeling, scaffolding, and coaching (Collins et al., 1991). We, as the mentoring faculty, modeled through demonstration of the principles, processes, and strategies involved in grant writing and supported student learning by providing detailed explanations of the reasons behind key decisions (Collins et al., 1991; Ding, 2008). We scaffolded by providing structure through examples from previously submitted proposals (e.g., budget, budget justification, project summary, management plan, data management plan) and links to other

grant-writing resources (Collins et al., 1991; Ding, 2008). Finally, we coached during weekly meetings and through extensive feedback and discussion of said feedback (Collins et al., 1991; Ding, 2008). Another key feature associated with the cognitive apprenticeship approach is social interaction (Ding, 2008). By mentoring the junior scholars together, they leaned on one another, divided the workload, and solved problems more efficiently before seeking input or advice. Expert-novice collaboration is also ideal when implementing a cognitive apprenticeship approach (Ding, 2008). As faculty members who have established themselves as successful grant writers, we were able to provide the junior scholars opportunities to observe and practice grant writing, immersing them in the disciplinary culture at an R1: Doctoral University.

Results to Date

Junior scholars submitted a high-quality grant proposal to the funding program they identified. Because the junior scholars were not able to serve as PI or Co-PI on federal grants projects, per University policy, we included them as funded postdoctoral researchers in the proposal. That way, if funded, they have the opportunity to become postdoctoral researchers on a project they developed and are passionate about. If they take faculty positions elsewhere, we will negotiate a subaward to the universities through which they are hired so they could be project Co-PIs. By becoming Co-PIs on a federally funded grant project during their first year as faculty members, they will likely be ahead of their peers who are competing for the same faculty positions. The goal of the cognitive apprenticeship approach is to empower individuals to accomplish tasks independently (Ding, 2008). Although grant writing is an ever-evolving skill, having now seen the proposal development and submission process through from beginning to end, we are confident that the junior scholars have the skills they need to move forward independently.

Future Plans & Advice to Others

Although we have completed grant writing activities like this in the past, junior scholars' experience this time was more intense and the project directly aligned with their research goals. We will continue this practice with future junior scholars to provide them with grant-writing experience prior to becoming faculty members. This training prepares them to compete for a research-intensive faculty position and to mentor their own students in the grant writing process. For the process to be successful, however, three things must occur: 1) Mentors and mentees must allow time for the cognitive apprenticeship approach because intensive mentoring in grant writing takes time; 2) Mentors should continue to be the point of contact for institutional grants offices and collaborating personnel; and 3) Mentors should meet with the junior scholars post submission to reflect on the process and provide feedback on ways to improve in the process.

Costs & Resources Needed

The primary cost associated with the cognitive apprenticeship approach to grant writing mentorship is time. It takes significant time to model, scaffold, and coach in a deliberate and consistent manner over the course of several months, on top of traditional advising and mentoring responsibilities. It is also important to note that junior scholars should also be willing and able to commit extra hours to writing the proposal.

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Who wants to bring agriculture into their classrooms?
An online professional development program

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Who wants to bring agriculture into their classrooms?
An online professional development program

Introduction

The general population is often not involved with production agriculture and is, therefore, considered to be agriculturally illiterate which impairs their ability to make educated decisions regarding the industry (Kovar & Ball, 2013). And with students being at least three generations removed from the farm, it is important for us to consider the educator's role as they are key to a student's education (Reed Jr., 2019). When students have good teachers, "its impact amounts to an entire year's worth of learning" (Moe, 2011, p. 4). Therefore, in order to make agriculture literacy more prevalent in schools, the willingness and interest of the teachers must be taken into consideration. Consequently, we need to know what types of teachers are interested in bringing agriculture to their classrooms, and we should know why they are interested in doing so.

The Farm to Classroom Program is funded by the USDA NIFA and performed by the School of Human Sciences, with the College of Education, at Mississippi State University. The overall focus of the Farm to Classroom Program is to educate teachers on ways that they can bring agriculture into their classrooms. It is the mission of the project team to institute teacher professional development opportunities to train teachers on how to integrate agricultural education lessons into core curriculum areas. The purpose of this study was to describe the demographics and professional interests of our participating teachers in order to better meet the needs of teachers through future professional development opportunities.

Methodology

The free Farm to Classroom workshop is unique in the fact that it is a fully online educational course. Though the Canvas Learning Management System, participants complete the course at their own pace within the span of a month. This allows us to reach a broader group of educators. The course is made up of four different modules. Each module includes a short lesson on ways educators can bring agriculture into their core subjects, a discussion thread for participants to share what they have learned, and a short hands-on assignment. These lessons eventually lead up to a final assignment of participants creating their own agriculture-based lesson plan.

Advertisement for the workshop began a month in advance using the program's website and social media platforms. Email messages, containing a digital flyer and link to the application, were sent to public school superintendents and extension offices across the state. An incentive of two free CEUs was used to obtain more participation.

The application to participate in the workshop contained demographic questions such as where the participants currently teach and what subjects and age group they have taught. At the very beginning of the workshop, the participants were asked to take a pre-test. The instrument asked the participants questions regarding their interest and background in agricultural literacy. It is from these applications and tests, from the year 2020 to 2022 (three sessions), collected the data needed to describe the demographic information about the teachers who are interested in the program.

Results to Date

From 2020 to 2022 a population of 161 teachers ($N = 161$) have applied to the workshop, with 94.4% coming from across the state ($n = 152$), and 5.6% of teachers ($n = 9$) from other states. Most applicants taught elementary school, making up 45.3% ($n = 73$), with 31.7% teaching high school ($n = 51$), 14.3% teaching middle school *(n = 23)*, 2.5% taught all grade levels *(n = 4)*, and 6.2% specialized in other areas *(n = 10)*. Every core learning subject was represented among the applicants. 6.8% taught math subjects ($n = 11$), 8.1% taught science *(n = 13)*, 0.6% taught social studies ($n = 1$), 11.8% taught ELA *(n = 19)*, and 29.8% taught multiple or all these subject areas ($n = 48$). Surprisingly, 42.9% of teachers ($n = 69$) taught in other areas. Some of these areas included agriculture-based topics, but this group also included culinary arts, elementary art, special education, etc. In total, 111 individuals participated in the program ($N = 111$). 97 of the respondents reported their gender ($N = 97$), 86.6% of the respondents were female ($n = 84$), with 12.4% identified as male ($n = 12$) and 1% preferred not to say ($n = 1$).

Participating teachers were asked if they considered themselves to be agriculturally literate. Of the 97 respondents ($N = 97$), 6.1% replied with "Definitely Not" ($n = 6$), 17.5% replied with "Probably not" ($n = 17$), 33% replied with "Might/Might Not" ($n = 32$), 27.8% replied with "Probably yes" ($n = 27$), and 11.3% replied with "Definitely Yes" ($n = 15$). These numbers show that the majority of the participants are agriculturally illiterate and therefore do not have previous experience with production agriculture (Kovar & Ball, 2013).When asked why they wanted to take a course on agricultural literacy, a few participants stated simply that they were interested and wanted to learn more about it. However, several teachers responded with concern for their students. Overall, teachers seemed to want their students to know where their food comes from and how they can grow their own food to be self-sufficient and experience new opportunities.

Future Plans/Advice to Others

Our future plans include reaching out to past participants to assess the impact of agricultural literacy in their classrooms. We will assist those who reach out for help and continue to provide resources through the website and social media platforms. We will also continue to use the online Canvas platform. Our hope is to continue to reach a broader audience by expanding our social media to gain more interest. By looking at the results of the program, it can be concluded that a wide variety of educators are wanting to bring agriculture into their classrooms, but they often do not feel confident in doing so. Our advice is to encourage extension-based services to conduct their own online workshops for interested teachers within their area. When developing the workshop, make it valuable for teachers on all levels

Costs & Resources

This program is supported by the Agriculture and Food Research Initiative – Education and Workforce Development Program (2020 – 68018 - 1021637), from USDA, NIFA, who provided a total grant funding of 212,784 dollars for the expenses of this program, and we are in the third year of the four year program. Associated costs included creating a Canva Pro account to create visuals for social media, funding for a master-level graduate assistant, and partial summer funding for three faculty members. Resources included free access to Canvas for workshops, free advertising and promoting through social media, and advertising through email communication.

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A Systemic Review of Queer Representation and Critical Paradigms Within the *Journal of Agricultural Education*

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Introduction and Objective

There is currently a vast deficit of scholarship surrounding queer identities and experiences in agricultural education (Murray et al., 2020). However, there have been several multicultural education (ME) studies published in the *Journal of Agricultural Education* (JAE), which may encompass queer identities. Banks (2016) describes the core philosophy of ME as, "the idea that all students—regardless of their gender; sexual orientation; social class; and ethnic, racial, or cultural characteristics—should have an equal opportunity to learn in school" (p. 2). ME assumes certain students or groups have better opportunities to learn because of identities that are privileged in society (Banks, 2016). Therefore, one of the goals of ME is liberatory educational reform (Banks, 2016). Critical paradigms support this goal of ME as they acknowledge the power relations of knowledge creation, and work to emancipate oppressed groups (Tracy, 2020). It is imperative that ME studies utilize critical theories and paradigms to question institutional norms and power dynamics in education. This systemic review analyzed the current representation of queer identities and critical paradigms in ME scholarship published in the JAE.

Theoretical Framework

Queer theory guided this study as it is a critical theory that focuses on deconstructing identity categories privileging some identities over others (Tierney & Dilley, 1998). Studies that include queerness allow researchers to critique institutional barriers to inclusion based upon identities (Tierney & Dilley, 1998). Additionally, *queer* is utilized in this framework as an inclusive term to signify nonnormative sexual orientations and gender identities (Henderson, 2019).

Methodology

A systemic review was conducted among JAE articles published with an emphasis on multicultural education. Inclusion criteria for the systemic review were: (a) empirical research studies, (b) ME focus, and (c) explicit identification of theoretical or conceptual frameworks. The initial search on the JAE database resulted in 21 articles. From this search, three articles did not focus on ME, two articles did not specify a framework, and one article was not an empirical study. After assessing inclusion and exclusion criteria, fifteen (N = 15) articles were included in the review. Articles were read and categorized based upon methodology, study population, and presence of critical paradigms, sexual orientations, and gender identities. Representation of sexual orientation was categorized by level of emphasis in the study, with *primary* = focus of study; *secondary* = included, but not central focus; *tertiary* = emerged in findings. Similarly, gender identity representation was analyzed for presence of binary (i.e., male or female) or non-binary/queer gender identities.

Findings

From the 15 articles reviewed, the majority encompassed a population of undergraduate post-secondary students (*n* = 7), followed by secondary students (*n* = 3), in-service teachers (*n* = 3), graduate students (*n* = 1), and post-secondary institutions (*n* = 1). Every study included racial and ethnic minorities as a primary research focus, with only three including sexual orientations. Further findings are described in Table 1.

Table 1
Presence of Queer Representation and Critical Paradigms

Study #	Methodology	Theoretical/Conceptual Framework	Critical Paradigm	Representation	
				Sexual Orientation	Gender Identity
Study 1	Quantitative (survey)	Theory of Homophily	Y	Secondary	
Study 2	Qualitative (case study)	Critical Race Theory	Y		
Study 3	Qualitative (content analysis)	Transformative Learning Theory	Y		
Study 4	Experimental	Social Identity Wheel, Developmental Model of Intercultural Sensitivity	N	Secondary	Binary
Study 5	Qualitative (content analysis)	Appraisal Theory, Model of Cultural Experience & Evoked Emotion	N		
Study 6	Qualitative (case study)	Theory of Identity Development, Racial Identity Model	N	Tertiary	
Study 7	Quantitative (survey)	Diversity Inclusive Program Model	N		Binary
Study 8	Quantitative (survey)	Diversity Inclusive Program Model	N		Binary
Study 9	Quantitative (survey)	Social Cognitive Theory	N		
Study 10	Quantitative (survey)	Cross-Cultural Education	N		Binary
Study 11	Quantitative (survey)	Social Identity Theory	Y	Secondary	
Study 12	Quantitative (survey)	Multicultural Competence	N		
Study 13	Quantitative (survey)	Teaching Concern Model	N		Binary
Study 14	Quantitative (survey)	Cultural Critical Consciousness & Self-Reflection	Y		
Study 15	Quantitative (survey)	Inclusion	N		Binary

Note. A missing descriptor indicates lack of representation in the study.

Discussion, Conclusions, & Recommendations

From the systemic review, there were three findings that warranted discussion. First, the deficit of qualitative studies found excludes opportunities of marginalized individuals to share lived experiences that could help MEs goal of educational reform (Banks, 2016). Second, current ME studies published in JAE display heteronormativity through exclusion of queer identities. However, it is important to note that awareness of diverse gender identities may not have been as widespread when some of the older studies were conducted. This conclusion supports work from Murray et al. (2020) that acknowledges the deficit of queer representation. Finally, there was little representation of critical frameworks found. Without the ability of critical theories to critique and deconstruct oppressive systems, ME cannot be fully achieved (Banks, 2016). From the findings, authors recommend an expansion of queer identities and critical theory into JAE research. Additionally, qualitative methodologies should be utilized to learn about lived experiences of marginalized individuals in agricultural education. These lived experiences, in combination with queer and critical theories, can help inform best practices for scholars and educators focused on multicultural education practices.

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"Blazing the Trail" for the Future: BIPOC Students' Experiences with Colleges of Agriculture

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"Blazing the Trail" for the Future: BIPOC Students' Experiences with Colleges of Agriculture

One of the most widely discussed topics in America has been diversity, equity, and inclusion (DEI; Mehta et al., 2020). DEI has also been an issue within agricultural education, as data have shown that Black, Indigenous, and People of Color (BIPOC) have been severely underrepresented at all educational levels (Hartmann & Martin, 2021) and agricultural education has been slow to react (Horst & Marion, 2018). Consequently, many have advocated for changes to help increase BIPOC representation over the years (Bowen, 2002). Understanding BIPOC individuals' motivations for choosing to pursue education and careers in agriculture can provide helpful information to colleges of agriculture looking to recruit, retain, and prepare students from underrepresented groups. Therefore, the purpose of this study was to examine the factors contributing to BIPOC students' choice to major in agricultural-related disciplines. This research aligns with Priority Three of the AAAE National Research Agenda (Roberts et al., 2016).

Methods

The target population for this qualitative study was BIPOC students enrolled in colleges of agriculture in Arkansas. As participants had to meet specific criteria, purposive snowball sampling was used, and the sample consisted of six undergraduate students enrolled in agricultural degree programs in Arkansas. Three participants attended the University of Arkansas-Fayetteville, while the other three attended Southern Arkansas University. Data were collected via one-on-one interviews using a semi-structured interview guide, which was organized to allow the interviewer the opportunity to ask probing questions and guide the flow of the conversation as necessary (Flick, 2006). Each participant was asked about their experiences and to describe their motivation for pursuing postsecondary education in agriculture. Data were collected during the fall 2021 semester, and interviews were conducted until data saturation was reached. The conceptual framework used in this study was Strayhorn's (2013) College Choice Model.

Results

Participants discussed two major themes during the interviews: (1) reasons for choosing their major and (2) barriers faced by BIPOC students in agriculture. Regarding reasons for majoring in agriculture, participants pointed to involvement in youth-based organizations, School-Based Agricultural Education (SBAE), and identification of a mentor. Four participants had participated in either 4-H or FFA, and one explicitly identified their membership as the major factor influencing their decision to major in agriculture. SBAE courses played a role in influencing half of the participants who reported finding their passion primarily through agriculture classes in their high school. They stated that interesting coursework and in-depth explorations of agricultural careers sparked their interest in pursuing agricultural degrees. However, mentorship was the most influential factor on participants' choice to pursue a degree in agriculture. Every participant identified at least one mentor who heavily influenced their decision to pursue agriculture as a career; mentors ranged from parents to family friends and industry professionals.

Participants also discussed barriers faced by BIPOC students in colleges of agriculture, which included stereotyping, lack of minority representation, and finances. Participants reported that these barriers impacted them before and during their university enrollment. Most participants identified having experienced some type of stereotyping from various sources, including classmates, potential employers, and family members. Overwhelmingly, participants reported exposure to the stereotype that minorities have no place in the agricultural industry. One participant stated, "I think it's sometimes not being taken seriously, just kind of like, why are you here?" Additionally, multiple participants reported experiencing microaggressions related to the stereotyping of BIPOC individuals in agriculture; one participant said, "…having to deal with that every day, it just kind of builds up until you want to break." Lack of BIPOC representation in majors was also a barrier, where all respondents reported a low sense of belonging and feeling unwelcome among their peers. Participants were not comfortable speaking up in class when they were the only minority, with one stating they "stick out like a sore thumb." Finances were another common barrier reported by participants. One student postulated that a lack of generational wealth is a major barrier to entry in agriculture that minorities face at a higher rate than Caucasians, and a scholarship could easily be the deciding factor in whether or not a BIPOC student attends college.

Conclusions & Recommendations

This study provided a glimpse into the financial and social burdens placed on BIPOC students within colleges of agriculture in Arkansas, however, the findings of this study only represent the experiences of participants and should not be generalized to all BIPOC students. While each participant's experience in their respective college was different, all perceived that achieving an agricultural degree was more difficult as a minority student, as the results revealed that these BIPOC students faced many challenges entering and remaining in colleges of agriculture. Throughout the interviews, it became evident most of the participants were first generation college students who were from economically depressed areas and backgrounds. The BIPOC students who choose to "blaze the trail," as stated by one participant, face many challenges and do so for many reasons: some individuals desire well-paying, successful careers; some want the opportunity to help others; and others chose this path to prove their critics wrong. Minority students in predominately White universities, specifically in colleges of agriculture, must embody qualities such as perseverance, adaptability, and resolve in order to overcome barriers and endure in the face hardship.

To better recruit, retain, engage, and prepare BIPOC students, colleges of agriculture should be intentional in their efforts to connect with all communities, not just those common among their student bodies. Furthermore, helping BIPOC students alleviate the financial barriers associated with college would be beneficial. BIPOC students should be better educated about existing scholarship and financial aid opportunities, specifically those targeting underrepresented groups. Stereotyping of and microaggressions against BIPOC students in colleges of agriculture are major issues. To combat this, colleges of agriculture should prioritize cultural competence training for students, faculty, and staff within the college. Lack of minority representation also plays a key role in making BIPOC students feel welcome. Colleges of agriculture should attempt to showcase BIPOC students and faculty through different channels including college and departmental newsletters, social media, and various other forms of publications.

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Advancing Agriculture: The Impact of an American Fellowship Program on Ghanaian Teachers

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Advancing Agriculture: The Impact of an American Fellowship Program on Ghanaian Teachers

Introduction

Africa is currently experiencing a "youth bulge," perpetuating a cyclical issue of lack of employment opportunities, causing financial barriers for the continent's youth (International Labour Organization [ILO], 2020; UN Economic Commission for Africa, 2017) Additionally, 27.4% of Africa's population experiences food insecurity, according to the UN FAO. This economic and food security crisis requires innovative solutions to both engage and educate youth on successful agricultural practices and create job opportunities (Roberts, et al., 2016). Additionally, Ghana's food insecurity remains an urgent human development challenge (Mohammed, 2021).

For Ghana's economy to move forward and prosper, education reform needs to occur (Osei, 2006). Holistic education reform of any kind involves understanding relevant issues and educator beliefs towards those issues (Newcomb et al. 2004). Student motivation can be leveraged through authenticity of those beliefs (Mendes, 2003; Schraw & Olafson, 2015).

School-based agricultural education poses a double-barreled solution to these issues, by both addressing food insecurity through the promotion of agricultural excitement and knowledge and facilitating social change through educators. Therefore, the Borlaug Institute partnered with 4H Ghana for The International Agricultural Education Fellowship Program (IAEFP) to bring pedagogically trained U.S. agriculture-degree holding graduates to Ghana to implement 4H Ghana programming into Ghanaian junior and high schools. The objective was to both promote and model student-centered learning and provide an opportunity for teachers to adopt 4H Ghana's agricultural practices and begin or continue a chapter at their school.

The purpose of this study was to assess the impact of IAEFP and 4H Ghana on the Ghanaian educators involved in the program. The research questions guiding this study were:
1. What is the impact of IAEFP on the teachers?
2. How do participant teachers view the impact of IAEFP on their students?

Methods

This study reports on the qualitative analysis of open-ended items about the impact of the [Program] included in a feedback survey as part of a broader study on the program.

Participants were recruited during a national 4H Ghana event in Koforidua, Ghana. All participants had been working with an IAEFP volunteer in their schools for at least nine months. Participants were asked to complete the survey on a physical copy. There was no direct incentive to complete the survey.

Participants were n=14, ages ranging from 27-42, with 8 identifying as male and 6 identifying as female. Qualitative data was analyzed using constant comparative analysis (Lincoln & Guba, 1985).

Results

This survey resulted in two major themes, *personal improvement* and *student improvement*, with three sub themes under personal improvement, and four sub themes under student improvement. Subthemes under personal improvement were: *increased agricultural competencies, improved teaching methods, advanced leadership skills.* Within the student improvement theme, subthemes were: *increased public speaking abilities, advanced leadership skills, improved agricultural competencies, and enhanced confidence*.

Participants in the study discussed their personal improvements by detailing their *increased agricultural competencies* due to their involvement in the program. Participants said they learned practical skills, such as fertilizer application where a participant said, "I have learnt [sic] that agriculture is a time bound activity because the crops should be planted at the right time, right place and at the right rate." Participants also detailed increasing their teaching abilities, within the *improved teaching methods* subtheme, including a participant who said they, "Upgraded myself as a teacher through teacher training organized by 4H Ghana/IAEFP." Lastly, participants explained their *advanced leadership skills*, with one participant who said the program, "Also helped in [me] having some leadership competencies."

Participants commented on the impact of the program with their students, more than any other theme, with the *increased agricultural competencies* sub theme within the *student improvement* theme. It is described by participant stating the program has, "built their passion, skills and attitude towards farming and agriculture as a whole." Additionally, participants commented on their students' *increased public speaking abilities*, stating that due to the program students now, "are able to speak in public." The subtheme, *advanced leadership skills*, was detailed greatly, with one participant stating, "4H Ghana has really opened their eyes in terms of leadership." Lastly the theme *enhanced confidence* was widely commented on, with one participant stating, "students have built self-dependence attitudes working on their own with little or no supervision."

Conclusions and Recommendations

From the perspective of teachers involved in [Program], both their personal and their students' improvement is evident. Skills such as public speaking, leadership, confidence, and teaching abilities are all social skills with the potential to amplify the improved agricultural knowledge, competencies, and attitudes described within this study. These improvements, especially if expanded upon, can make an improvement within Ghana's agricultural sector by impacting students, via supported teachers, to have greater skills in agriculture, and soft skills to support their practical abilities. This change is vital as Africa's population increases, remains holistically youthful by comparison to other global regions, and food insecure.

Based on these findings, we recommend an increase in 4H Ghana's activity's implementation throughout Ghana, and increased support for teachers to become involved with the organization. Based on the direct positive feedback on the [American Organization's] teacher training associated with IAEFP, we strongly recommend increasing the amount of teacher training by qualified and skilled trainers made available. Lastly, we recommend increased research be done from the student perspective on the impact of this program to gain further insight into its reach.

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An Overview of Mental Health Research in Agricultural Education

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An Overview of Mental Health Research in Agricultural Education

Mental illness and risks associated with poor mental health are of growing national concern in agriculture and education. In a 2020 Center for Disease Control and Prevention (CDC) report, Petersen et al. revealed the agriculture, forestry, fishing, and hunting industry was one of five major occupational groups experiencing significantly higher suicide rates. While suicide risk among educators is lower, research indicates teachers experience increased risk of mental health disorders, job stress, and burnout (Li, 2020). These effects have been magnified following the COVID-19 pandemic. According to the CDC Foundation (2021), a combined 64% of teachers self-reported symptoms consistent with clinical depression or anxiety and 53% consider leaving the profession more now than before the pandemic. These phenomena have been lightly explored in the literature among agricultural educators. Research by Shoulders et al. (2021) indicated agricultural educators experienced symptoms of work-related stress including fatigue, worrying, and forgetfulness following the pandemic. While comprehensive reviews on mental health within education have been conducted, most focus on assessing levels of stress and burnout, identifying stressors, or classroom intervention methods (Anderson et al., 2019; Yamaguchi et al., 2019). No reviews have previously been conducted within agricultural education and related fields. The lack of peer-reviewed literature in this space poses an immense challenge to understanding and exploring mental health within agriculture and among agricultural educators (Baker et al., 2022). The purpose of this study was to examine existing mental health and well-being research in agricultural education literature from 2012-2022 to identify knowledge gaps and provide insight for future research inquiries. This study was guided by the following objectives: (1) identify research relating to mental health and well-being in agricultural education; (2) categorize studies based on key words, year published, population served, and study design in agricultural education. This study aligns with National Research Agenda of AAAE Priority 7: Addressing Complex Problems (Andenoro et al., 2016) by summarizing scholarship to advance research and build upon previous findings to support the mental health and well-being of educators and people working in agriculture.

Conceptual Framework

We used the occupational stress model to examine literature under the lens of agriculture and education as occupational groups. The occupational stress model attempts to capture risk and factors in personal, occupational, social, and home environment arenas that contribute to stress outcomes (Davidson & Cooper, 1981). This model provides utility for exploring potential factors in these arenas, taking into account precursor variables contributing to work-related stress and how stress might manifest (Davidson & Cooper, 1981).

Methodology

We conducted a scoping review to synthesize research on mental health and well-being in agricultural education and related fields to identify trends based on publication date, populations of interest, and study design (Munn et al., 2019). We systematically examined research manuscripts published in the Journal of Agricultural Education (JAE) and proceedings from the American Association for Agricultural Education (AAAE) National Conference from 2012-2022 for keywords present in titles and abstracts relating to mental health and mental illness (i.e.,

mental illness, mental health, well-being), mental health conditions, (anxiety, ADHD, bipolar, borderline personality disorder, depression, dissassociative disorder, eating disorder, obsessive compulsive disorder, posttraumatic stress disorder, psychosis, "schizoaffective disorder, and schizophrenia) and associated risks or outcomes of poor mental health (self-harm, suicide, stress). When necessary, all variations of a term were used in a search (e.g., posttraumatic stress disorder/post-traumatic stress disorder/PTSD). The initial search of items ($N = 2,434$) resulted in a sample of 71 units for review (24 journal articles, 24 research proceedings, and 23 poster proceedings). Next, we excluded those not relating to human well-being or stress, misusing or mischaracterizing terminology (e.g., test anxiety) and removed innovative posters, resulting in a final selection of $n = 38$. We categorized the units based on year, key terms identified, population of interest, and study design.

Results

Of those 38 units, there were 17 JAE research articles, 15 research, and 6 poster proceedings from the AAAE National Conference. Of the units, key words included mental health ($n = 2$), well-being ($n = 9$), anxiety ($n = 1$) and stress ($n = 26$). A majority of research conducted over the past decade was either published or presented in 2013 ($n = 7$), with equal representation of studies exploring mental health and related concepts in the first half of the decade (2012-2016), as compared to the second (2017-2022). With respect to populations of interest, four themes emerged. These included: agricultural education teachers ($n = 29$), individuals working in agriculture ($n = 5$), students ($n = 4$), and community members ($n = 1$). Most of the research conducted used quantitative study designs ($n = 22$). Nine studies employed qualitative methods, five used a mixed-method design, and two were undefined.

Conclusions, Recommendations, and Impact on Profession

Despite the importance of mental health in the context of education and the agriculture industry, less than 2% of JAE literature and national AAAE conference proceedings in the last decade related to mental health, related disorders, or associated risk and outcomes. Majority of research focused on assessing stress among populations of agricultural teachers, which is consistent with findings revealed Shoulders et al. (2021), and was quantitative in nature. Future efforts might be directed toward underrepresented lines of inquiry, such as mental health literacy, understanding needs of students with mental health disorders, and mental health-informed teaching strategies. Scholars in our field should also consider research with understudied populations, such as agricultural workers or those in rural communities. Additionally, because mental health is incredibly nuanced and complex, more efforts to qualitatively explore research questions around mental health and mental illness in our field might provide more frameworks for future inquiry. Articles and proceedings included in this study were selected based on keywords, so the depth to which researchers adequately addressed issues varied. Given the rising number of educators experiencing work-related stress and rising levels of teacher attrition following the pandemic, these findings ultimately point to a need to further explore mental health within the discipline (CDC, 2021). We recommend an additional study be conducted to further identify themes in this research to inform future direction of scholarship in this area. Finally, we encourage scholars in our field to explore collaborations with colleagues in medicine, psychology, psychiatry, public health, and sociology to drive research initiatives that address complex mental health challenges in schools and rural communities to elevate the number and caliber of related studies conducted in our discipline.

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Analyzing Demographic Data to Support and Promote Livestock Science Camp Participation

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Introduction

Over 19 million jobs within the agriculture industry provide more than 10% of employment in America (USDA, 2020). The Livestock Science Camp at NC State University aims to provide high school-aged students hands-on experiences focused on the livestock industry and career paths. Over the last five years, 91% of participants claimed to have learned a variety of career options from Livestock Science Camp that they were unaware of prior to the start of camp (Pickworth, 2022). Short-term programming related to high school students' perceptions of agriculture careers has been shown to be effective in increasing knowledge of postsecondary opportunities and career paths in agriculture (Jean-Phillipe et al., 2017). The American Camp Association (2021) reports that the average price of overnight camps exceeds $500; however, 93% of those camps offer financial aid to lower-income families. Livestock Science Camp is a participant-funded camp ($900), meaning the camper's fees cover their room and board, food, bus travel, and counselor supervision. Agriculture organizations in North Carolina are contacted to support a meal or an individual participant who indicated in the application a need of financial assistance. Over the years, potential participants have applied and indicated the need for financial assistance but ultimately did not participate. The reason for non-participation ranges from not being able to receive financial assistance, being accepted into a fully-funded program, or unknown. One goal is to create equal opportunity for minority populations interested in agriculture as a career. The purpose of this study was to assess the demographics of camp participants from 2017 to 2022 in comparison with North Carolina's economic distressed county ranking based on average annual wage. Tier one is the most distressed, and tier three is the least distressed. Data was also sorted into urban versus rural areas, as the USDA (2020) reports that most minority populations are located within urban areas. This study supports Research Priority 4 to provide more meaningful learning for all.

Theoretical Framework

Drawing on the Social Cognitive Career Theory (SCCT) developed by Lent, Brown, and Hackett (1994), we aimed to determine the theoretical concepts of participants who want to seek a future career in agriculture from participating in the Livestock Science Camp. Social Cognitive Career Theory extends from Bandura's Social Cognitive Theory (1986) in which cognitive (knowledge, expectations, and attitudes), behavioral (skills, practice, and self-efficacy), and environmental (social norms, access to community, and influence on others) factors are being considered in relation to components of a person life (gender, ethnicity, social support, and barriers) that help shape their career development (Jean-Phillipe et al., 2017).

Methodology

This quantitative study utilized Livestock Science Camp application data from 2017 to 2022. Two sets of data were utilized, those that applied and participated in the camp and those that did not. Between 2017 and 2022, there were 181 participants (N= 181) and 55 participants (N=55) who applied but did not participate in the camp. The demographic data collected

included age (14-18), race (Black or African American, Hispanic or Latino, White (non-Hispanic), Asian or Pacific Islander, Native American or American Indian, Other, Prefer not to Answer), economic status (less than $30,000, $30,000-55,000, $55,000-80,000, $80,000-120,000, greater than $120,000, prefer not to answer (do not need a scholarship)), and North Carolina county location. Averages of 2017 to 2022 were calculated to analyze overall demographics to support the need for funding and participation.

Results

Of those who applied and participated in the camp, the average number of participants was 30 per camp, and the average age was 16. 72.3% of participants reported being white (non-Hispanic), 14.9% reported being black or African American, 7.1% were Hispanic or Latino, and under 2% reported being Asian or Pacific Islander, Native American or American Indian, and other. Participants whose gross household income is greater than $120,000 represented over 25% of campers (25.9%). Only 7.1% of participants reported that their gross household income is less than $30,000. 54% of participants live in a tier 3 county, and under 25% are from Tier 1 and Tier 2 counties. The percentages of participants from North Carolina's urban and rural areas were calculated, and 72.4% of our participants are located within urban areas. The data set for those who applied to participate in camp ultimately did not show any significant differences compared to the data set of those who did participate. It is essential to note that the reason for the non-participation of the 55 participants is unaccounted for or unknown.

Conclusions

Livestock Science Camp offers a unique learning experience for high school-aged students at a university level with access to university staff members who are experts in their field, extension personnel, industry leaders, current university students, hands-on labs, and university research facilities. There is a need for agriculture workers, and this program allows high school-aged students to learn and get hands-on experience within the livestock industry; however, the findings from this research prove that this learning opportunity is only available to those who can afford it as over 25% of participants' gross household income is more significant than $120,000, not including those who preferred not to answer waiving the option for financial aid. The opportunity to participate in camp should be independent of household income. Even though over 70% of camp participants are from urban counties, over 70% of the participants identify as white (non-Hispanic).

Implications/Recommendations/Impact on the Profession

This data helps to better understand the need for funding and participation in a program producing agriculture learning experiences. We plan to continue seeking funding for the camp from the university and other agriculture organizations. Educators must strive to create and facilitate equal opportunity, bridging a gap between minority populations, socioeconomic status, and the agriculture industry. Scholarships are needed and will become a priority component.

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Teacher Confidence in Instructional Methods

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Teacher Confidence in Instructional Methods

Introduction/Theoretical Framework

Engaging students through effective instructional methods impacts student success (Hunt et al., 2009). The AAAE's research agenda surrounding meaningful, engaged learning asks how educational program delivery in agriculture can evolve to meet the needs and interests of students (Roberts et al., 2016). To address this question, teachers must have a specific set of characteristics, including the ability to offer instruction in a variety of methods (Hunt et al., 2009). Rosenshine and Furst (1971) are known for their research on effective teaching. In their work, they listed variability in instruction as one of the fundamental characteristics of effective teachers. To be able to offer variety in the classroom, teachers must have confidence in carrying out several instructional methods. According to Bandura (1997), people are more likely to engage in activities that they have more confidence in performing.

The purpose of this study was to examine teacher confidence in using instructional methods at different career stages, as recommended by Voges et al. (2020). Framed within Huberman's (1989) model of the professional life cycle of teachers, teachers are categorized as being novice (early), mid-career, and late-career. This theory describes teachers in the novice stage as focusing on their new role and tasks, while mid-career teachers are showing confidence in their teaching pattern. By late-career, teachers are expected to be comfortable in their careers. While these distinct qualities of each career stage exist, Huberman (1989) claims that progression through the career stages may not always be linear. Understanding teacher confidence helps identify areas that can be improved to effectively engage school-based agricultural education (SBAE) students for both preservice and practicing teachers, directly addressing an AAAE research priority.

Methodology

To accomplish the purpose of this study, a descriptive, cross-sectional survey design was employed as part of a larger study (Fraenkel et al., 2019). The population was all SBAE teachers in Texas who were members of the state agriculture teachers association ($N = 2,172$). A sample of 326 teachers was needed according to Krejcie and Morgan (1970), however this was doubled due to anticipated low response rates ($n = 652$). Random sampling was used to develop the list of sample participants. The questionnaire, used with permission from the original researchers (Smith et al., 2015), had six demographic questions and 10 questions in each of the following areas for each teaching method: training received, time spent using the method, perceived effectiveness of the method, and confidence in using the method for a total of 46 questions. The methods listed in Table 1 were included with a definition for reference from Newcomb et al. (2004). The instrument was accepted as valid and reliable as published in earlier studies surveying the same population (Smith et al., 2015; Voges et al., 2020). After obtaining IRB approval from Texas A&M-Commerce the questionnaire was distributed through Qualtrics with five total contacts through email, each one week apart (Dillman et al., 2014). A final response rate of 16.7% was achieved ($n = 109$). Means and standard deviations were calculated in Microsoft Excel for each group of teachers based on early, middle, and late career stages.

Findings

According to the findings, middle career teachers had the highest confidence when using four of the ten instructional methods (field trips, guest speakers, lecture, and role play). Mid-career stage teachers also had the lowest confidence in four of the ten methods (demonstration, discussion, experiments, and independent study). Confidence only showed linear progression through early, middle, and late career stages in two methods (cooperative learning and supervised study). Refer to Table 1 for mean confidence levels reported for using all 10 instructional methods by participants in early, middle, and late career stages.

Table 1
Confidence in Instructional Method Based on Career Stage (N=109)

Instructional Method	Early (1-5 yr)		Middle (6-15 yr)		Late (16+ yr)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Cooperative learning	3.95	0.96	4.00	0.85	4.18	0.78
Demonstration	4.32	0.66	4.21	0.56	4.43	0.58
Discussion	4.12	0.78	3.92	0.83	4.00	0.67
Experiments	3.33	1.03	3.21	0.94	3.38	0.95
Field trips	3.30	1.10	3.64	0.89	3.43	1.14
Guest speakers	3.32	1.09	3.64	0.81	3.42	1.23
Independent study	3.44	1.00	3.29	1.16	3.38	1.21
Lecture	4.11	0.72	4.29	0.70	4.00	0.84
Role play	2.18	1.10	3.00	1.13	2.60	1.24
Supervised study	3.47	1.04	3.50	1.05	3.67	0.84

Note. Scale: 1 = *Very Low Confidence* to 5 = *Very High Confidence*.

Conclusions/Implications/Recommendations

Findings confirm that progression through the professional teacher life cycle is not always linear, as described by Huberman (1989). It is important to revisit the professional life cycle and evaluate inconsistencies. While Huberman describes mid-career as being a time of confidence and experimentation, we found mid-career participants had the least confidence four of the 10 instructional methods when compared to participants in the early and late career stages. Similarly, teachers in the late career stage expressed less confidence than middle career teachers in four categories, showing a decrease in confidence in certain skills throughout the professional life cycle. While early career stage teachers are expected to be in a period of survival, they expressed greater confidence than middle career teachers in four methods. Are some early career teachers over confident? Recommendations for practice that could help improve lower confidence levels would be providing continual training and education specific to middle career teachers. Additionally, providing training in the two methods that teachers expressed the lowest overall confidence in, experiments and role play, could be beneficial for teachers in all career stages. Further research should investigate previous training received in instructional methods, and identify factors leading to lower teacher confidence, particularly in middle and late career teachers. A limitation of this study is the low response compared to the population size, limiting its generalizability. Therefore, this study should be replicated with the national population using increased efforts to encourage participant response.

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Bumpers College of Agricultural, Food and Life Sciences Student Perceptions of Career Preparedness

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Introduction

It is well documented faculty and employers have preferences on skills necessary for college graduates to be successful in the workplace, but inquiries with students' perspectives are limited (Brosnan, 2019; Cox et al., 2010; Irlbeck & Akers, 2009, Kurtzo et al., 2016; Robinson et al., 2007). "While research on employer and teacher perceptions of college and career readiness skills exists, a limited amount of literature has been published regarding the topic from the postsecondary students' perspective" (DiBenedetto & Willis, 2020, p. 46). The AAAE National Research Agenda includes a research priority of "meaningful, engaged learning in all environments" which fits this study.

Conceptual Framework

DiBenedetto and Willis (2020) defined nine career readiness skill clusters: life skills, career skills, social skills, interdisciplinary topics, knowledge competencies, incidental learning skills, dispositions and experiences. Robinson et al. (2007) surveyed recent graduates' supervisors to see how they prioritized employability skills. Problem solving and analytic were the most sought-after skills for these employers, while written communication was ranked the lowest. "Seven of the employability skill constructs had a mean weighted discrepancy score greater than .60, including problem solving and analytic (MWDS = 1.08), risk taking (MWDS = .82), motivation (MWDS = .76), managing conflict (MWDS = .68), decision making (MWDS = .67), lifelong learning (MWDS = .62) and listening (MWDS = .62)" (Robinson et al., 2007, p. 22). The four lowest rated were supervision, coordination, ability to conceptualize, and written communication (Robinson et al., 2007). The National Association of Colleges and Employers' (NACE) uses eight competencies to discuss career readiness: career and self-development, communication, critical thinking, equity and inclusion, leadership, professionalism, teamwork, and technology (National Association of Colleges and Employers, 2021).

Methodology

A quantitative survey instrument was developed based on Robinson et al.'s (2007) study and administered using Qualtrics. Nonprobability voluntary sampling was used for undergraduate students in Bumpers College of Agricultural, Food and Life Sciences at the University of Arkansas (N=1,853). In the spring of 2022, students were recruited using emails and reminders sent out by departmental staff members. An initial email and three follow-up emails were utilized. The researcher had no way of tracking how many students received the emails, but 188 completed the questionnaire. This paper reports two of the larger study objectives by describing the Bumpers College undergraduate students (1) perceived levels of skill importance to their future careers and (2) perceived levels of competence at performing employability skills. Pilot testing data was collected and a Cronbach's coefficient alpha for the student questionnaire was 0.940, which is an excellent score for internal reliability.

Results/ Findings

Students rated 28 skills on importance to their future careers. The four-point scale ranged from no importance to major importance. Six skills had mean scores of 2.75 or higher. Solving problems ($M = 2.87$; $SD = .36$), identifying problems ($M = 2.82$; $SD = .40$), meeting deadlines ($M = 2.77$; $SD = .51$), listening attentively ($M = 2.76$; $SD = .51$), working well with fellow employees ($M = 2.75$; $SD = .51$), and adapting to situations of change ($M = 2.75$; $SD = .50$) were in this category. The five lowest rated skills scored 2.39 or lower. These skills consisted of

contributing to group problem solving ($M = 2.39$; $SD = .70$), assigning/delegating responsibility ($M = 2.37$; $SD = .76$), identifying sources of conflict among people ($M = 2.28$; $SD = .76$), taking reasonable job-related risks ($M = 2.23$; $SD = .70$), and supervising the work of others ($M = 2.18$; $SD = .76$). The other 17 skill mean scores ranged from 2.73 to 2.46.

Students also rated their competence at performing the same 28 employability skills. The four-point scale ranged from no competence to major competence. The six highest skills had mean scores of 2.54 or higher. Working well with fellow employees ($M = 2.65$; $SD = .55$), meeting deadlines ($M = 2.61$; $SD = .59$), ability to work independently ($M = 2.61$; $SD = .62$), empathizing with others ($M = 2.55$; $SD = .61$), understanding the needs of others ($M = 2.55$; $SD = .61$), and listening attentively ($M = 2.54$; .62). The lowest ranked five skills had mean scores of 2.20 or lower. These were assigning/delegating responsibilities ($M = 2.18$; $SD = .72$), identifying sources of conflict among people ($M = 2.18$; $SD = .66$), initiating change to enhance productivity ($M = 2.12$; $SD = .76$), supervising the work of others ($M = 2.05$; $SD = .74$), taking reasonable job-related risks ($M = 1.94$; $SD = .75$).

Conclusions

Student respondents reflected the results of Robinson et al. (2007). That study's results highly ranked solving problems (#1), listening attentively (#5), identifying 51 problems (#6), and working well with fellow employees (#7). This mirrored some of the findings in the DiBenedetto & Willis study (2020). They found solving problems, time management, and teamwork ranked highly among their respondents. Furthermore, the National Association of Colleges and Employers (2021) recommended active listening, demonstrating dependability, adapting, and collaborating with others as needed for career readiness.

Student respondents ranked their competence at performing certain employability skills as high including, working well with fellow employees, meeting deadlines, ability to work independently, empathizing with others, understanding the needs of others, and listening attentively. Most of these were ranked very high in the Robinson et al. (2007) study, with ability to work independently (#1), working well with fellow employees (#3), listening attentively (#4), and meeting deadlines (#8). Respondents had high overlap between the skills rated least useful and low in competence. Four of the five lowest skills included assigning and delegating responsibilities, identifying sources of conflict among people, taking reasonable job-related risks, and supervising the work of others.

Implications/ Recommendations

Students reported competence for only three of the six skills they reported as necessary for career success. Thus, faculty and advisors should assess this for students in their career tracks and encourage learning opportunities where students can learn and apply these skills. Moreover, utilizing assessments to evaluate students' actual competence instead of their perceived competence would be useful. Due to the overlap of skills rated least useful and those in which students had the least competence, the aforementioned use of skill assessments could provide insight on if the perception of usefulness was connected to pre-existing perceptions of low competence. Expanding the sample size and comparing those results to industry studies of needed skills could inform curriculum development and meet student and industry needs for career preparation.

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Content Taught in Agricultural Mechanics Courses, 1980 to 2021: A Survey of Nine 1862 Land-Grant Universities

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Introduction and Purpose

Courses in vocational agriculture mechanics at the collegiate level were offered at some institutions before the Smith-Hughes Act of 1917. The courses have historically ranged from metal fabrication to electricity to structures (Burris et al., 2005; Byrd et al., 2015; Hubert, 1996). Prior studies, however, identified discrepancies in the average number of courses required for teacher education degree completion in agricultural education with regards to agricultural mechanics (Hubert, 1996; McKim & Saucier, 2013). This study's purpose was to identify the agricultural mechanics topics taught in offered or, in some cases, required courses from 1980 to 2021 at select land-grant universities to prepare agricultural education teachers. The year 1980 was chosen for the beginning of data collection due to the 1980s being a decade of great upheaval and change in vocational education with the 1983 *A Nation at Risk* report, as well as enactment of the Carl D. Perkins Vocational Education Act in 1984 (Bell, 1983; Carl D. Perkins Vocational Education Act, 1984). This study aligns with research priority five of the *American Association for Agricultural Education (AAAE) National Research Agenda*, i.e., Efficient and Effective Agricultural Education Programs (Roberts et al., 2016).

Methods

We used historical research methods to collect and analyze our data (McDowell, 2002). This involved accessing online databases and search engines, exchanging personal communications with teacher educators, and reviewing institutional library resources. The study's sample was identified through systematic sampling of 1862 Land-Grant Universities. The three AAAE regions were used as a sampling frame: 1) North-Central, 2) Southern, and 3) Western. Each region had its 1862 Land-Grant Universities alphabetized; such were numbered based on that alphabetical order and a random number generator was used to select three institutions from the respective regions. We created a digital database to organize findings, including detailing all documents received and examining such for accuracy and authenticity (McDowell, 2002), i.e., internal criticism and external criticism were conducted (Johnson & Christensen, 2012).

Findings

An analysis of agricultural mechanics courses required for degree completion leading to certification to teach agriculture found that different topics were taught in the courses offered by the nine universities. However, a common trend were courses involving 1) hot and cold metal working (welding), 2) the teaching of agricultural mechanics topics (pedagogy), 3) agricultural structures, and 4) small gasoline engines content (see Table 1).

Table 1

Topics Taught in Agricultural Mechanics Courses for Degree Completion in Agricultural Education, Teacher Education, 1980 to 2021, at Nine 1862 Land-Grant Universities

Years	ND State Univ.	Purdue Univ.	WV Univ.	Univ. of AZ	Univ. of ID	WA State Univ.	LA State Univ.	Auburn Univ.	Univ. of KY
1980 –1984	[b]	1, 4, 9	[b]	2, 4, 9	[b]	1, 2, 3, 8, 9	1, 4	[b]	[a]

Year									
1985–1989	b	1, 4, 9	b	1, 2, 3, 4, 9	b	1, 2, 3, 4, 8, 9	1, 4 a	b	a
1990–1994	2, 4, 8	1, 4	b	1, 2, 3, 4, 9	b	1, 2, 3, 4, 8, 9	a b	b	a
1995–1999	2, 4, 8	1, 4	6, 8, 9	1, 2, 3, 4, 9	1, 2, 3	1, 2, 9	b	1, 4	a
2000–2004	2, 4, 8	1, 4	6, 8, 9	1, 2, 3, 4, 9	1, 2, 3	1, 2, 9	b	1, 2, 4	1, a
2005–2009	2, 4, 8	1, 4	2, 4, 8	1, 2, 3, 4, 9	1, 2, 3	1, 2, 9	b	1, 2, 4	1, a
2010–2014	2, 4, 8	2, 4	1, 4, 5, 9	1, 2, 3, 4	1, 2, 3	2, 9	b	1, 2, 4	1, a
2015–2021	2, 4, 8	2, 4	1, 4, 5, 9	1, 2, 3, 4	1, 2, 3	2, 9	b	1, 2, 4	1, a

Note. 1 = Intro. to Ag Mechanics; 2 = Welding; 3 = Small Gasoline Eng./Ag Power; 4 = Construction/Structures; 5 = Electricity; 6 = Plumbing/Irrigation; 7 = Ag Computer Systems; 8 = Electives, 9 = Teaching Ag Mechanics. [a]Indicates course(s) was/were not specified and subject to advisor approval. [b]Indicates information not found for required courses' topic(s).

Washington State University and West Virginia University experienced the greatest change in the topics taught in agricultural mechanics courses from 1980 to 2021 (see Table 1). Prior to 1995, West Virginia University required courses that included six of the nine identified course topics, the most of any institution. Louisiana State University, with one, had the fewest specified courses, which included one of the nine topics, with the expectation that students would complete one or more related elective courses pending their advisor's approval (see Table 1).

Conclusions, Implications, and Recommendations

Five of the nine universities experienced changes in course topics from 1980 to 2021, with four modifications the most. Six universities had zero to one course topic change in their agricultural mechanics courses during the period studied. This may imply that the universities found these course topics to be of high importance to their teacher preparation programs, and by extension to their states' school-based agricultural education (SBAE) curricula. However, congruence with relevant industry standards or expectations for entry-level employees was unclear, and that may also warrant investigation. Implications from this study may support the need for professional development on topics not taught in the institutions' agricultural mechanics courses, e.g., drone technology, maintenance, and repair, or advanced sensors and controls. We recommend that universities also identify topics comprising other agricultural courses required for degree completion in agricultural education, teacher education to assess whether the content taught supports SBAE instructors' preparation to teach their states' curricula and how that may have changed over time.

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Defining the Employability Skills of Agricultural Educators: A Quantitative Look into the Confidence Levels of Agricultural Educators on Their Personal Employability Skills

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Introduction, Purpose, and Objectives

According to the National Council for Agricultural Education, the mission of agricultural education is to "prepare students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems" (The Council, 2022, para. 3). With this mission, educators are expected to teach content in the agriculture, food and natural resources (AFNR) areas as well as instill employability skills into students to ensure they are prepared for the workforce. The responsibility to ensure a prepared workforce has largely fallen on CTE and agricultural education (Fristoe, 2017; Martinez, 2007; Symonds et al., 2011). Even with the importance of this longstanding goal, industry has reported that students exiting secondary education programs are not prepared for most entry-level positions (Casner-Lotto et al., 2006; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008). In order to fulfill these expectations, teachers must first possess these skills themselves. Much of the published literature has assessed the traits and qualities of effective agricultural educators but none were found to have considered an agriculture teachers' personal employability skills thoroughly. The purpose of this study was to assess the perceptions of agricultural educators on their degree of confidence in which they possess certain employability skills. The following research objectives were assessed:

1.) Describe the degree of confidence that participating agricultural educators have in their personal employability skills using central tendencies.

Theoretical Framework

For the purpose of this study, we selected the Social Cognitive Career Theory (SCCT) for the underlying theoretical framework. The SCCT has been developed from Bandura's social cognitive theory, and adapted to "the processes of interest information, career selection, and performance" (Lent et al., 2002, p. 258). Relative to agricultural education, this theory does not solely consider the self-efficacy in pedagogical content knowledge but focuses on "four primary sources of information (or types of learning experience): (1) personal performance accomplishments, (2) vicarious learning, (3) social persuasion, and (4) physiological and affective states" (Lent et al., 2002, p. 262). These four sources of information are closely related to both student and educator standards upheld within agricultural education.

Methods

The research study conducted utilized Qualtrics to administer a demographics and self-efficacy assessment to agricultural science teachers across Alabama, Georgia, and Florida regarding their own personal employability skills. Each participant was asked to rank their confidence levels on their personal employability skills using a Likert-type scale, ranging from 1 = "Not Confident at All" to 5 = "Extremely Confident".

The instrument was developed using the Perkins Collaborative Resource Network Employability Skills Framework. The instrument reliability was assessed post hoc using Cronbach's alpha and no reliability issues were found. Overall, a list of 99 viable emails in Alabama, 185 viable emails in Georgia, and 115 viable emails in Florida was compiled ($N = 399$). We received a response rate of 18.30% ($n = 73$) with ($n = 10$) partial responses. This meets the 10% minimum for quality descriptive research (Gay & Diehl, 1992). Furthermore, a MANOVA was used to ascertain any statistical differences among early/late respondents and no differences were found (Lindner et al., 2001).

Results, Conclusions, and Recommendations

With regards to utilizing systems and technologies, agriculture teachers ranked their confidence levels relatively low, with only 50-70% feeling very confident or extremely confident in understanding, using, monitoring, and improving systems and technology. With an increased demand for content knowledge and technology in both the classroom and the industry, these numbers can be concerning.

At least 70% of respondents expressed that they were either very confident or extremely confident in area of general academic skills, which included reading, writing, math, and science. Agriculture teachers expressed the greatest amount of confidence in reading skills for this category with 93.1% stating they were very confident or extremely confident. The same teachers ranked themselves even higher in thought processes such as critical thinking, making sound decisions, and problem solving, where none of the respondents indicated no confidence. Published literature can be found regarding desirable traits for agricultural educators including good community relations, effective management, personal and student motivation (Roberts & Dyer, 2004). Organizational and managerial skills assessed teacher confidence in planning, organizing and managing time, money, and personnel. The overall confidence teachers indicated in these areas had a much wider range than the other categories of the survey with managing materials having the highest confidence levels at 86.6% of respondents stating that they were very confident or extremely confident in doing so. Their lowest confidence levels for this section of the survey can be found in time management skills at 63%.

Agriculture teacher competency in information processing, ranged in marked confidence, with 86.3% of respondents feeling very confident or extremely confident in using information but only 73.9% of the group feeling the same way about communicating the information. Other verbal and written communication skills were studied, and respondents indicated that they felt more comfortable (78.1%) in conveying information in writing than they did communicating information verbally. Other communication skills were marked above 75% for very confident or extreme confidence levels, indicating that teachers are less confident in communicating their content than they are in understanding their content, which could contribute to gaps in the classroom. Other Questions asked agricultural educators to rate responsibility, self-discipline, flexibility, working independently or with a team, their willingness to learn, personal integrity, professionalism, taking initiative, workplace attitude, sense of self-worth, professional growth, responding to customer needs, exercising leadership, negotiating resolve conflicts, and respecting individual differences. In this area, teachers felt a great deal of confidence in all areas, except for negotiating resolve conflicts where less than 70% of respondents felt very or extremely confident.

In conclusion, teachers need more continuous training on classroom and industry technology and communications for their classroom, FFA chapter, and community. More research should be done to first identify if the teachers that felt less confidence in these areas were traditionally or alternatively certified. Furthermore, information regarding industry-level training for teachers should be compiled in order to identify the source of this instructional gap.

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Describing Agricultural Communication Content Training for SBAE Teachers

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Describing Agricultural Communication Content Training for SBAE Teachers

Introduction

Characteristics related to instruction are the largest segment of characteristics suggested for effective school-based Agricultural Education (SBAE) teachers identified by Roberts and Dyer (2004). Specifically, having an "excellent knowledge of the subject matter" is a key characteristic (Roberts & Dyer, 2004, p. 91). Van Driel and Berry (2010) stated there is often a separation in teacher preparation programs between subject matter knowledge and pedagogy. This separation has resulted in an emphasis on the procedures of teaching the subject matter rather than working to ensure pre-service teacher understand the content (Van Driel & Berry, 2010). King et al. (2013) posited that creating new curriculum and lack of teaching materials are often the top stressors for some SBAE teachers.

The quantity of SBAE programs that teach agricultural communication content have been increasing (Miller et al., 2015) though these are newer curriculums for SBAE teachers. Calico et al. (2014) stated that curriculum focused on preparing students for agricultural communication-related careers is important. It was also identified that the areas of most interest to secondary SBAE students in agricultural communications courses were design, multimedia, writing, and careers respectively (Calico et al., 2014). Universities providing coursework in agricultural communication report a steady increase in enrollment, supporting the need for students to be aware of career opportunities through SBAE (Miller et al., 2015).

Purpose and Objectives

The purpose of this study was to describe agricultural communication content utilization by SBAE teachers. The following research questions guided this study: 1) What agricultural communication content is being taught in secondary SBAE programs? 2) What is the SBAE teachers' espoused level of comfort for teaching agricultural communication content? 3) What training have SBAE teachers received in agricultural communication content?

Theoretical Framework

Shulman's (1986) theorization of Pedagogical Content Knowledge (PCK) guided this study. PCK has been described as the application of contextually specific quality pedagogical choices to the subject or content (Shulman, 1986). PCK has also been framed as "…subject specific pedagogical knowledge that enables teachers to represent the subject matter that so that it will be accessible to students," (Darling-Hammond, 2006, p. 82). Types of content in agricultural communication are operationalized as content knowledge. The various trainings that teachers accessed, and espoused comfort are operationalized as representations of PCK. With the variety of content areas in SBAE, it is important to assess the comfortability, knowledge, training opportunities offered to SBAE teachers to ensure the content being taught is accurate and delivered effectively.

Methodology

This non-experimental study used a descriptive, survey research design. The target population was current SBAE teachers, which is roughly 14,000. A cluster sample of 1887 teachers was surveyed. The unit of cluster was U.S. states, and up to 40 randomly selected teachers per state were included. All teachers for states with fewer than 40 teachers were included. Emails were acquired through the National FFA Organization. The Tailored Design

Method (Dillman et al., 2014) guided recruitment to participate in the study via electronic mail Qualtrics links. Agricultural communication content teaching, level of comfort, and trainings were assessed using a researcher-developed instrument. Cognitive interviews were conducted with members of the target population who were not in the sampling frame to ensure that the questionnaire was understandable and met the needs of the research (Dillman et al., 2014). In all, 284 complete responses were returned, resulting in a response rate of 15.1%. Low response rate for this population has been documented (e.g., Hile, 2019; McKim & Sorensen, 2020).

Results

Of the responses, 165 (58.1%) reported teaching agricultural communication content in their SBAE program. For objective one, of those who teach agricultural communication content, the top three areas taught were: (1) *Demonstrate oral communication skills* (95.8%), (2) *Utilize printed agricultural media* (78.2%), and (3) *Utilize photography and graphics* (68.5%). Content areas taught least were *Create an agricultural communications campaign* (27.8%) and *Modify photography and graphics* (30.9%). For objective two, teachers reported feeling the most comfort teaching the agricultural communication content area of *Demonstrate oral communication skills* ($M = 4.34$, $SD = 0.96$), somewhat comfortable teaching to *Utilize printed agricultural media* ($M = 3.95$, $SD = 0.94$), and slightly less comfortable teaching to *Utilize photography and graphics* ($M = 3.90$, $SD = 0.92$). Teachers were least comfortable teaching *Investigate agricultural cooperatives structure and function* ($M = 3.47$, $SD = 1.02$). For objective three, almost half the time when an agricultural communication content area is being taught, teachers reported no training in that area (47.2%). When they reported having training in a content area, the most common response was *preservice* (53.0%), with all other options being less than 20%.

Conclusions, Implications, and Recommendations

Agricultural communication is taught by a majority of SBAE teachers, which is congruent with the projected increase of agricultural communication content in SBAE classrooms by Miller et al. (2015). University faculty, and SBAE support organizations should be conscientious of this increase when designing pre-service and in-service professional development. For objective one, SBAE teachers teach oral communication and utilization of various media sources most often, which mirrors content found to be interesting to students in post-secondary programs (Calico et al., 2014). For objective two, SBAE teachers espouse the most comfort when teaching students oral communication and utilization of print and visual media. As Shulman (1986) describes, PCK can be improved with comfortability of the content leading to a greater ability of a teacher to instruct students in the content area. For objective three, SBAE teachers utilized *preservice coursework* as the predominate training mode. Teacher preparation programs are therefore the primary source for developing PCK, specifically learning to make content accessible to students (Shulman, 1986). It is recommended that research explores association of demographic variables, such as teacher age and location of program, and quality of trainings to content taught since Miller et al. (2015) documented post-secondary programs and noted regional differences of access to those programs.

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Determining the Professional Development Needs of School-Based Agricultural Education Teachers in Oklahoma

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Introduction/Need for Research

Teacher attrition has reached critical levels in the United States and globally, with one in every four teachers not remaining in the profession past year three (OECD, n.d.). Attrition rates increase for teaching positions with greater responsibilities like; special education, science, technology, engineering, mathematics (STEM), and agricultural education (Nguyen & Springer, 2019). For 32 years, research surrounding school-based agricultural education (SBAE) teacher needs have been studied, finding that program management, administrative tasks, public relations, SAE development, instructional technology, behavior management, and work-life balance have been identified as recurring needs, yet these needs have not been addressed to make an actionable change for SBAE teachers (DiBenedetto et al., 2018; Doss et al., 2022; Shoulders et al., 2021).

These historic gaps in specific human capital knowledge and skills, as well as school and community relationships, are further compounded by the stress and anxiety that SBAE teachers face while attempting to manage a complete 21st century program and work-life balance (Shoulders et al., 2021). The purpose of this study was to determine the current needs of SBAE teachers in Oklahoma. Two research questions guided this study; 1) what are the current needs of SBAE teachers in Oklahoma based on the needs developed by SBAE teacher supporters, and 2) do those needs differ based on SBAE teachers' personal and professional characteristics?

Conceptual Framework

The *Conceptual Model of Support for SBAE Teachers* framed this study to provide a human lens for evaluating the depth of 21st century program needs (Marsh, 2022). The conceptual framework is grounded in *Maslow's Hierarchy for Teachers* (Fisher & Royster, 2016), *The Three-Component Model for Agricultural Education* (FFA, n.d.), and *The Effective Teaching Model for SBAE Teachers* (Eck et al., 2019), which provides researchers a lens to identify the level of SBAE teachers needs within their professional roles and responsibilities to provide opportunities to develop their career-specific human capital and increase job satisfaction and career retention. Evaluating SBAE teachers' individual needs based on personal and professional characteristics can influence how professional development opportunities, resources, tools, and skills are developed and implemented to make a more impactful change and satisfy the needs of Oklahoma SBAE teachers.

Methodology

SBAE teachers in Oklahoma who attended one of the five area Chapter Officer Leadership Training (COLT) conferences hosted by the Oklahoma FFA Association ($n = 372$) served as the accessible population (Privitera, 2020) for this study. The 42-item instrument was developed utilizing a previously validated list of items representing the perceived needs of 21st century SBAE teachers by expert SBAE supporters (Marsh, 2022). SBAE teachers attending the COLT conferences were asked to scan a QR code to complete the survey questionnaire, of which, 127 teachers completed the questionnaire, resulting in a 34% response rate. The response rate generated by this study is statistically in line with other response rates from online or digital survey questionnaires (Wu et al., 2022). Statistical Package for the Social Sciences (SPSS) Version 25 was used for the data analysis, including descriptive statistics and an analysis of variance (ANOVA).

Findings

Research question one sought to determine the current needs of SBAE teachers in Oklahoma. With an overall mean of 3.16 across the 42-items, there is a perceived need from Oklahoma SBAE teachers. The identified items representing the greatest need included 1) *assess to essential resources* (3.50), 2) *curriculum resources* (3.50), 3) *support from local school administration* (3.48), and 4) *work-life balance* (3.46). The lowest perceived needs included *support for hybrid teaching* (2.87), pedagogical *content knowledge* (2.87), *diversity, equity, and inclusion (DEI) training* (2.78), and *lesson planning training* (2.72).

The second research question aimed to determine if SBAE teachers' needs differ based on their personal and professional characteristics. Composite needs scores had a potential range from a low of 42 to a high of 168. Females had a higher mean need score of 135.7 as compared to male respondents at 117.5. This finding is statistically significant, with the lower bound of the 95% confidence interval for female respondents at 127.3 as compared to the upper bound for male respondents at 125.4. Analysis by career phase showed that early-career teachers had a higher need score when compared to late-career teachers (F (3,149) = 74.389, $p < .05$). Comparing early-career to mid-career and mid-career to late-career showed no statistical difference.

Conclusions, Implications, and Recommendations

Thirty-six of the 42 items achieved a mean indicating a need associated with SBAE teachers in Oklahoma. The top two items included a*ccess to essential resources,* and *curriculum* resources, aligning to an ongoing need for content, curriculum, and practical resources to support their programs (Doss et al., 2022). In addition, items such as *support from local school administration*, *work-life balance*, and *respect* represent the human need to establish relationships, boundaries, and a level of respect within their professional role as SBAE teachers (Shoulders et al., 2021).

A statistically significant difference was found in SBAE teachers self-reported need scores based on personal and professional characteristics of participants. Early-career SBAE teachers participants corresponded with a higher percentage of female SBAE teachers in the Oklahoma, which represents the population of participants with higher self-reported need scores. While this finding was statistically significant, it also speaks to the practical significance of developing professional development training, curriculum resources, and instructional tools that meet the individual personal and professional characteristics of Oklahoma SBAE teachers. Further connecting to the need to evaluate teachers through a human lens using the *Conceptual Model of Support for SBAE Teachers* (Marsh, 2022).

It is recommended that instructional tools and curriculum resources that are easy to access and provide a structured plan for ease of implementation for SBAE teachers be developed. Additionally, professional development opportunities should focus on furthering the human capital of the complete person for SBAE teachers in Oklahoma. Future research should further investigate the impact of such professional development. Furthermore, the perceived expectations of SBAE teachers from superintendents and school administrators should be evaluated to potentially address the value, respect, and workload of Oklahoma SBAE teachers.

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Evaluating Long-Term Outcomes of an Agriculture and Natural Resources Leadership Development Program

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Evaluating Long-Term Outcomes of an Agriculture and Natural Resources Leadership Development Program

Introduction/need for research

Rural and agricultural leadership development programs have existed since the Kellogg Farmers Study Program was established in 1965 (W.K. Kellogg, 2000). Despite having over a half century of history, research documenting program impacts and outcomes is rather limited. The Kellogg Foundation evaluated 28 programs in 2000, providing a general profile description as well as impacts of the programs. They noted that agricultural LDPs were well positioned to continue developing industry leaders. In their 2016 evaluation of Cooperative Extension System administered LDPs, Lamm et al. noted increasing pressure on program directors to rigorously evaluate their programs and provide evidence of worth but acknowledged that comprehensive evaluation can be challenging. None the less, they recommended robust evaluations to ensure impactful ANR LDPs. To that end, this research is part of a larger, longitudinal study aimed at evaluating the outcomes and impacts of the Wedgworth Leadership Institute (WLI).

Conceptual or theoretical framework

Kirkpatrick and Kirkpatrick (2016) recommend evaluating training programs to improve them and demonstrate their value, but also to "maximize transfer of learning to behavior" (p. 5). Participants should implement what they learned, resulting in measurable outcomes. The Kirkpatrick model (Kirkpatrick & Kirkpatrick, 2016) includes four levels: reaction, learning, behavior, and results. Reaction evaluates how engaging and relevant the training is to participants. Level two determines the degree to which participants acquired the intended knowledge and skills. Behavior is the degree to which participants apply what they learned, while results determine the degree to which the intended program outcomes were achieved.

Methodology

This evaluation research sought to illuminate long-term outcomes and impacts of WLI. WLI was established in 1989 at the University of Florida, with the intent to "develop and refine the leadership capabilities of leaders who, in turn, will be prepared to become increasingly involved in policy formation" (WLI, mission, para. 1). The program involves 12 seminars, incorporating approximately 55 days of instruction delivered over nearly two years. Each class includes approximately 30 participants chosen from a competitive selection process. We explored experiences and perceptions of WLI alumni five and ten years after completing the program. Specific research objectives were 1) describe WLI alumni experiences during and after their participation, and 2) determine participants' perceptions of the WLI. Two focus groups were conducted, one with five-year alumni and one with ten-year alumni. Two researchers facilitated the conversations simultaneously, using a moderator's guide. The focus groups were audio-recorded and transcribed. Two researchers reviewed and analyzed the transcripts separately, then compared their analyses, reconciled codes, and developed themes.

Results/findings

Theme 1: Behavior change credited to WLI. Theme one included two sub-themes: using their voice and taking on leadership roles. Participants noted an increased frequency of "using their voice" to lead in various spaces. Additionally, participants listed multiple leadership roles they had taken on since their completion of WLI, specifically crediting the program. These roles were in agriculture organizations, community governance, and others.

I took on the role of a local chapter [organization] president after going through the program, something that I very adamantly and openly said I would not do because I did not like to be the leader... I don't think I would've done it otherwise. (Class A member)

Theme 2: Expanded network and strengthened relationships. The second theme contained three sub-themes: personal friendships and support, professional network, and obligation by association. Participants gained a great deal from the people they met as a result of the program. There was a strong sense of friendship among classmates, demonstrated by birthday messages, hugs at alumni events, and genuine care for each other. Participants also described the professional network they had acquired, including classmates, WLI alumni from other classes, as well as speakers and those who facilitated learning for the program. A Class B member said, "…it's having that network of people that help you navigate the difficulties of agriculture, and for me, that's one of the biggest, it's been the biggest benefit I got from the program". While the first two subthemes illustrate benefits participants gained in the form of a network, the third theme illustrates expectations participants felt as a result of being part of the WLI network. They are called upon for various activities as a direct result of being a WLI alum.

Theme 3: Broadened perspectives. Theme three emerged as participants spoke about being able to see things differently, between varying commodities, across the agriculture industry holistically, and within their larger communities. Participants credited WLI for their ability to approach issues in more complex ways, and to see others' perspectives. A Class A member noted "It opens up your periphery and looking at Florida, Florida's impact in the nation, and then throughout the world and how do these industries work together to make Florida stronger."

Theme 4: Enhanced awareness of self and others. In the final theme, participants expressed that WLI enhanced their self-awareness, as well as their understanding of and how to work with diverse people. One Class B participant recalled that the program "helped you identify different personalities and leadership styles, that sticks with me."

Conclusions

Kirkpatrick's levels of evaluation can be identified in the four themes that emerged from the focus groups. Participants spoke positively about the program, indicating satisfaction with their experience, even five and ten years after it concluded. The themes illustrate both learning and behavior, as participants credited WLI for specific skills they learned and behaviors they adopted. Importantly, some participants were able to articulate specific results their program participation had precipitated, that impacted their organization, commodity, or industry.

Implications/recommendations/impact

Our evaluation results suggest that WLI is effective. Not only are participants learning, but they are also implementing their learning through behavior that, in turn, impacts the ANR industry. Notably, WLI's mission is to increase leaders' contribution to policy formation, which appeared tangentially but not directly in the data. We recommend WLI continue to provide leader development and consider enhancing components that help leaders engage more directly in policy formation. Further, we recommend continued evaluation of this program and like programs to ensure ANR LDPs are impactful.

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Evaluating Psychometric Properties to Advance Agricultural Education Scholarship

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Evaluating Psychometric Properties to Advance Agricultural Education Scholarship

Introduction/need for research

Instrumentation is a critical function in measuring social and behavioral science impacts on stakeholders, teachers, and change agents (Field, 2013). Inquiries on instrument quality offers researchers evidence of the extent measurement attributes were examined, and thereby, assisting the researcher select the best instrumentation tool to use (Dillman et al., 2014). Internal validity and reliability have long been considered the quality gatekeepers prior to collecting any social science data (Ary et al., 2019). Internal validity is as simply as the instrument measures what it is designed to measure (Field, 2013; Strong et al., 2022). Reliability is the internal consistency of the reproductive instrument results when utilized with a similar population (Cronbach, 1951). Reporting both validity and reliability in a study using instrumentation are cornerstones of disseminating social science research (Lindner et al., 2001). Warmbrod (2014) recommended agricultural education researchers document the empirical evidence proving an instrument's variables are both valid and reliable. Priority 2 of our *National Research Agenda* suggested examining research practices to better develop and implement agricultural teaching and learning processes for enhancing sustainable agricultural systems development (Lindner et al., 2016).

Theoretical Framework

The theory of planned behavior (Ajzen, 1991) framed this study by utilizing the constructs; subjective norms, attitudes, perceived behavioral control and resulting behavior. Subjective norms are beliefs individuals or groups will endorse and accomplish a specific behavior. Ajzen (1991) indicated attitudes are developed paradigms of thinking that result in one's behavior. Perceived behavioral control is the discernment of the complexity in carrying out a preferred behavior (Ajzen, 1991). Resulting behavior is predicted by one or each construct. The purpose of this study was to investigate data collection instrument development and reporting subjective norms and resulting behavior in agricultural education literature over the last three years. Specifically, research objectives were: 1) determine the number of articles reporting data collection instruments reporting construct reliability, and 2) determine the numerical range of statements or questions utilized to measure constructs.

Methodology

Wright et al. (2007) indicated a systematic review is a method using a comprehensive search based on explicit protocols to review existing literature with a synthesis of data focusing on key questions. Systematic reviews use five steps; identify the critical question, formulate search parameters, systematically search databases, analyze data, and lastly, summary and data interpretation (Lee et al., 2021). The authors systematically reviewed, using the five steps, all articles from *Advancements in Agricultural Development* (*AAD*), *Journal of Agricultural Education* (*JAE*), *Journal of Extension* (*JOE*), and *The Journal of Agricultural Education and Extension* (*TJAEE*) from 2020 to 2022 to answer the research objectives. Authors reviewed five hundred thirty-one (*N* = 531) articles from the four refereed publications.

Results/findings

JAE reported forty-seven (*N* = 47) articles in 2022 and seventeen (*n* = 17, 36.17%) reported data collection reliability coefficients. Of the seventeen articles, the numerical range of statements or questions utilized to measure constructs extended from 1 to 10. *JAE* reported in 2021 (*N* = 73)

published articles and thirty-two ($n = 32$, 43.83%) utilized data collection reliability coefficients. Of those thirty-two, the numerical range of statements or questions was 1 to 19. In 2020, *JAE* reported eighty-three ($N = 83$) articles published and forty-one ($n = 41$, 49.39%) tested reliability coefficients. Statements numerically ranged from 1 to 32. Thirty-two was the severe outliner.

Thirty-four ($N = 34$) articles were published in *JOE* in 2022 and five ($n = 5$, 14.70%) reported testing reliability coefficients. The range of statements or questions was 1 to 10. *JOE* had eighty-two ($N = 82$) articles published in 2021 and six ($n = 6$, 7.31%) reported data collection reliability coefficients. One to twelve was the range of statements or questions. In 2020, *JOE* reported sixty-eight ($N = 68$) articles and nine ($n = 9$, 13.23%) had data reliability coefficients. The numerical range of statements or questions utilized to measure constructs ranged from 1 to 7.

AAD had fourteen ($N = 14$) articles published in 2022 and seven ($n = 7$, 50%) articles reported data collection reliability coefficients. The numerical range of statements ranged from 1 to 7. Twenty-seven ($N = 27$) articles were published in 2021 and twelve ($n = 12$, 44.44%) utilized data collection reliability coefficients. The numerical range of statements was from 1 to 7. Twenty-three articles ($N = 23$) were published in 2020 and eight ($n = 8$, 34.78%) reported data collection reliability coefficients. The numerical range of statements or questions ranged from 1 to 5.

TJAEE had ($N = 22$) articles published in 2022 and three ($n = 3$, 13.63%) articles had construct reliability coefficients. Statements ranged from 1 to 36. Thirty-six was an outlier given the small number of instrumentation studies in 2022. In 2021, thirty-three ($N = 33$) articles were published and seven ($n = 7$, 21.21%) reported construct reliability coefficients. The numerical range of statements was 1 to 10. There were twenty-five ($N = 25$) articles and three ($n = 3$; 12%) articles tested construct reliability coefficients in 2020. Statements or questions ranged from 1 to 7.

Conclusions

Authors reported fewer construct items produced lower construct reliability coefficients and thus, producing the potential of higher levels of error (Cronbach, 1951). Results indicated the majority of our published scholarship has not utilized data collection instruments over the last three years. If the researchers who have, chose to implement smaller numbers of items to measure constructs.

Implications/recommendations/impact on profession

There are two competing and acceptable, in our professoriate, indicators of construct reliability. Likert's (1932) convention in his quintessential work on measuring social variables suggested that for measurements to be reliable an *alpha* of .9 should be achieved. While Cronbach's (1951) convention postulates that a construct reliability of .7 be achieved. It is easy to see why many would select Cronbach's convention in that the amount of time to increase reliability to the threshold suggested by Likert may be inhibiting to researchers. Besides, what difference does .2 make anyway? With a threshold of .7, a potential variance of up to 30% exists; subsequently with a threshold of .9, a potential variance of only up to 10% exists (Field, 2013). A difference of 20% variance can be a substantial difference in the power of analysis and interpretation of effect size (Ary et al., 2019). As a profession we should seek the highest level of reliability as possible, when possible. When developing an instrument, researchers should include a maximum number of statements and questions and eliminate those that do not contribute to reliability and add additional questions when acceptable levels of reliability are not achieved.

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Examining if the NSF INCLUDES Aspire Alliance Teaching Practicum Improved Community College STEM Teaching Among Underrepresented Graduate Mentees

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Introduction

Improving academic program diversity and inclusion in higher education training programs can be accomplished by preparing and retaining underrepresented groups ([UR] ethnic minorities, women, people from low-income backgrounds, and those with disabilities) for faculty teaching positions (Chaparro et al., 2022). Consequently, several strategies exist to increase the number of teachers from UR in STEM fields (e.g., Chaparro et al., 2022). A mentored teaching practicum is one way to help teachers succeed and advance in their careers (Crawford & Smith, 2005). Correspondingly, exposing UR graduate students to various career paths and opportunities available in community colleges (CC) and universities can help achieve the United States' goal of increasing the representation of UR in higher education (Crawford & Smith, 2005; Thomas et al., 2007). The NSF INCLUDES Aspire Alliance Regional Change Team (RC) works within regional collaborative partnerships (one in Iowa, two in Texas, two in California, and one in Florida, and three new ones in Ohio, Massachusetts, and Wisconsin) to recruit and prepare UR graduate students for STEM faculty positions through two-year-mentored CC teaching practicum (Aspire Alliance, n.d.). The goal is to expose and attract more UR graduates to CC STEM faculty positions.

Conceptual Framework

This study followed Bandura's (1997) social cognitive theory of self-efficacy and Patton's (2010) developmental, formative, and summative evaluation approaches to determine the program's impact, including self-efficacy development. The study quantitively examined the impact of the CC-mentored teaching practicum on UR graduate mentees' CC teaching outcomes, including confidence, skill application, and efficacy development.

Methods

The study sample ($N = 102$) comprised PhD ($n = 37$) and master's ($n = 39$) graduate students purposively recruited from four collaborative regions, including Iowa ($n = 21$), West Texas ($n = 34$), North/East Texas ($n = 16$) and Southern California ($n = 44$) following their participation in the Aspire RC teaching practicum. Some participants ($n = 39$) did not indicate their graduate-degree level. The survey design guided the examination of the cumulative impact of Aspire mentored teaching practicum on the graduate mentees' CC teaching outcomes. Four cohorts of respondents were surveyed retrospectively via Qualtrics between 2019 to 2022. The survey had two pre-post questions on career confidence, each measured on a six-point scale (1 = not at all confident to 6 = extremely confident). The second set of questions examined the impact levels of seven CC teaching efficacy sources on a six-point scale (1 = a little impactful to 6 = extremely impactful). The third question contained one item measuring mentees' likelihood to apply learned skills in future practice measured categorically on a six-point scale (1 = not at all, 2 = a little, 3 = somewhat, 4 = moderately, 5 = very, and 6 = extremely confident). Paired sample t-Test, means scores, Chi-square goodness of fit, and profile plots were conducted. The study sample comprised whites ($n = 20$), Black African/ American ($n = 10$), Hispanics ($n = 23$), and other races grouped, including Asian/ Asian Americans, Pacific Islanders, I prefer not to respond, and Global citizen ($n = 22$). The rest ($n = 40$) did not identify with any race.

Results

RO1 examined the effect of the RC mentored teaching practicum on mentees' career confidence. Data presented as mean, standard deviation with an alpha level of .05, a two-tailed paired samples *t*-test was significant, $t(18) = 8.41$, $p < .001$, indicating that the mean difference (2.14 ± 1.44) between mentees' confidence to teach in a CC before (3.03 ± 1.32) and after $(5.18 \pm .94)$ teaching practicum was significantly different from zero. Similarly, paired samples *t*-test was significant, $t(18) = 8.41$, $p < .001$ for making a career decision, indicating that the mean difference (1.31 ± 1.09) between mentees' confidence to make CC faculty career decisions before (3.71 ± 1.23) and after $(5.02 \pm .94)$ teaching practicum was significantly greater than zero. The mean differences were positive for the two career items, indicating that the Aspire teaching practicum and mentorship enhanced mentees' CC career decisions and teaching confidence.

RO2 described the impact levels of the sources of CC teaching efficacy. Data presented as means and standard deviations—the sources of teaching efficacy with the highest rating of five and above were observing at least one class of a mentor's teaching (5.30 ± 1.12), using at least one observation form during a classroom visit (5.20 ± 1.33), and supporting a mentor's classroom management needs (5.04 ± 1.45). The next highest included reviewing a mentor's course syllabus as an exemplar (4.90 ± 1.45), using at least one observation form during a classroom visit (4.73 ± 1.72), and supporting a mentor's classroom management needs (4.64 ± 1.65) while the least rated was observing other teachers in a CC teaching (3.77 ± 2.47).

RO3 examined the likelihood that the UR graduate mentees would apply teaching skills after the teaching practicum. The Chi-square goodness of fit test was significant at an alpha value of .05, $\chi2(4) = 104.33$, $p < .001$, indicating significant differences in the likelihood that mentees will use mentoring skills in the future. Over 80% of the participants reported they were extremely ($n = 54$) or very ($n = 23$) likely to apply the skills in the future. A few participants ($n = 10$) also reported they were moderately likely to use the skills in the future, while only one reported they were not at all likely to do so.

Conclusions and Recommendations

The results were a subset of data collected from four regional collaboratives collected after the fact between 2019 and 2022. A complete analysis, including data from the class of 2023, will be completed and presented at future conferences. The results showed that mentees' confidence in CC teaching and career-related decisions improved. Furthermore, all mentorship efficacy sources were perceived to contribute to the UR graduate mentees' CC teaching efficacy significantly. Finally, over 80% of mentees said they were very likely or highly likely to use their mentoring skills in the future. The positive attributions of the Aspire teaching practicum on mentees indicate that increasing the diversity of the UR in agricultural education/ communication programs can be achieved through a well-thought-out, intentional recruitment and mentoring of UR graduate students for STEM faculty positions. Future evaluation research should involve more participants from UR in each prospective cohort and determine the role of mentorship relations in the process.

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Examining the Relationships Between Self-Efficacy and Information Sources Among Agriscience Teachers in Texas

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Introduction

Self-efficacy is "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 79). Teaching self-efficacy refers to teachers' perceived ability to plan and carry out teaching responsibilities (Tschannen-Moran et al., 1998). Self-efficacy beliefs result from subjective inferences drawn from four psychological sources of information: mastery, vicarious experience, verbal persuasion, and physiological body arousals (Bandura, 1997; Tschannen-Moran et al., 1998). Self-efficacy is extensively researched in math, science, and psychology (e.g., Mohamadi & Asadzadeh, 2012; Wang et al., 2017) and agriscience teaching because of its positive association with teaching and learning outcomes (e.g., McKim & Velez, 2016; Stripling & Roberts, 2013; Swan et al., 2011; Wolf, 2011). Findings by these scholars affirm Albert Bandura's assertion on the relationship between teaching self-efficacy and the four information sources (e.g., McKim & Velez, 2016; Wolf, 2011). Nevertheless, most studies concur that mastery experience is the most influential source of teaching self-efficacy (e.g., Mohamadi & Asadzadeh, 2012; Tschannen-Moran et al., 1998), while others suggest vicarious experiences (e.g., McKim & Velez, 2016; Wolf, 2011). Most agricultural education studies regard preservice, early career, student teaching, and teacher education courses but affirm prior findings on teaching self-efficacy (e.g., Swan et al., 2011; Wolf, 2011). The current research examined the relationship between self-efficacy and the four information sources using a sample of high school agriscience teachers.

Conceptual Framework

The study followed Bandura's (1997) social cognitive theory of self-efficacy and the cyclical teacher efficacy model (Tschannen-Moran et al., 1998). Four principal sources of information, "enactive mastery experience, vicarious experience, verbal/ social persuasion, and physiological and affective states," create efficacy beliefs through cognitive processing and reflective thought (Bandura, p. 79). The theories postulate a positive relationship between teaching self-efficacy and three sources except for physiological body arousals.

Methodology

The study examined differences in the distributions of agriscience teaching self-efficacy scores and the relationship between them and teaching self-efficacy. A cross-sectional survey design aided in answering the research objectives (Johnson, 2001). An online survey was shared via Qualtrics with a convenience sample of 122 agriscience teachers from high schools in Texas. The instrument's post hoc reliability tests yielded Cronbach's alpha coefficient values well within acceptable levels of .70 and above (Nunnally, 1978). The dependent variable, self-efficacy, was measured using the short version of the Teachers' Self-Efficacy Scale ([TSES] Tschannen-Moran & Woolfolk Hoy, 2001) containing 12 items depicting three self-efficacy domains - classroom management, student engagement, and classroom instruction, each measured on a nine-point Likert type scale (1 = cannot do at all – 9 = certainly can do). The independent variables- sources of self-efficacy were measured using the Pfitzner-Eden's (2016) scale (SSE) containing 16 items depicting mastery experience, social/verbal persuasion, vicarious experience, and physiological body arousal, each measured on a nine-point Likert type scale (1 = exactly false – 9 = exactly true). SPSS was utilized to conduct Friedman ANOVA ([RO1] Conover, 1999), Pearson's product-moment correlation (RO2), and forced multiple linear regression ([RO3] Field; 2018).

Results

RO1 compared agriscience teaching self-efficacy scores. A Friedman ANOVA revealed statistically significant differences in teachers' mean self-efficacy scores for classroom management, student engagement, and classroom instruction at .05 alpha level set a priori, $\chi 2(2) = 35.72$, $p < .001$. Boxplots visually revealed the lowest score for student engagement self-efficacy, necessitating its enhancement. A *post hoc* analysis using pairwise comparisons with a Bonferroni correction on each combination of self-efficacy variables further revealed the largest statistically significant differences between classroom management and student engagement (Conover, 1999).

RO2 determined the strength and magnitude of the relationship between the information sources and agriscience teaching self-efficacy. Pearson correlation analysis showed a statistically significant, strong positive correlation between teaching self-efficacy and mean mastery experience, $r_p = 0.51$, $p < .001$, 95% CI [0.37, 0.63]; a statistically significant moderate positive correlation between teaching self-efficacy and vicarious experience, $r_p = 0.48$, $p < .001$, 95% CI [0.32, 0.60]; and a statistically significant, moderate relationship between teaching self-efficacy and verbal persuasion indicated, $r_p = 0.30$, $p < .001$, 95% CI [0.13, 0.45]. On the contrary, a statistically significant, weak negative correlation was reported between teaching self-efficacy and psychological arousal, $r_p = -0.23$, $p = .011$, 95% CI [-0.39, -0.06].

RO3 examined variance in agriscience teaching self-efficacy due to efficacy information sources. Multiple linear regression analysis was statistically significant at .05 alpha level, $F(4,117) = 15.14$, $p < .001$, $R^2 = 0.34$. $R^2 = 0.34\%$, implying the four information sources collectively explained approximately 34% of the variance in teaching self-efficacy. Further assessment of the unstandardized *beta* values of the independent variables revealed that mastery experience was the most impactful, $B = 0.31$, $t(117) = 4.16$, $p < .001$ trailed by vicarious experience, $B = 0.18$, $t(117) = 2.85$, $p = .005$. Verbal persuasions and psychological arousal did not have an impact.

Conclusions and Implication

The hierarchy of self-efficacy scores across teaching self-efficacy domains reveals low student engagement self-efficacy. This threatens effective agriscience learning and calls for identifying resources to build teachers' student engagement self-efficacy. The relational analysis results corroborate Bandura's (1997) assertion that self-efficacy is positively related to mastery, vicarious and verbal experiences, and negatively to physiological arousals. The findings suggest that the sources are essential for quality learning and that agriscience teachers should be exposed to them, particularly mastery experiences. In addition, multiple linear regression revealed a non-significant impact of verbal persuasion, contrary to prior efficacy scholars (e.g., Tschannen-Moran & Woolfolk Hoy, 2001). The non-impact calls for additional research to help explain the reported statistics and underscores the need to expose the teachers to more verbal persuasion alongside other sources of self-efficacy. Verbal persuasions seemingly lose value in unfriendly school environments (see Greenglass & Burke, 2003). Future research should focus on specific aspects of agricultural science programs that present challenges in engaging students in learning and utilize longitudinal studies and psychophysiology tools to capture realistic measures of self-efficacy as a cognitive process.

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Food Waste Behaviors of College Students

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Food Waste Behaviors of College Students

Introduction/need for the research

Food waste is a significant environmental, economic, and social issue (Devin & Richards, 2018). Globally, 1.3 billion tons of food are lost annually (Food and Agricultural Organization [FAO], 2019), with Americans disposing of over 0.6 pounds of food per person daily (Thyberg & Tonjes, 2016). Disposed foods eventually end up in landfills, making food waste responsible for a significant amount of fugitive greenhouse gas (GHG) emissions (Lee et al., 2017). The primary reasons for food waste in homes include over-purchasing food and not using food promptly (Aschemann-Witzel et al., 2015). These behaviors result from a complex interaction between social and psychological factors influencing food waste. While consumers are the most significant contributors to food waste, research on specific behaviors is limited, especially for emerging adults (Neff et al., 2015; Qi & Roe, 2016; Stancu et al., 2016). Examining emerging adults (ages 18-29) is essential because this age group is a significant contributor to food waste and is more prone to waste food than older age groups (European Commission, 2014; Mondejar-Jiminez et al., 2016; Parfitt et al., 2010; Pearson et al., 2013). This study examined the psychosocial factors influencing food waste behaviors among college-age students, which aligns with the American Association for Agricultural Education (AAAE) National Research Priority Area 7: Addressing Complex Problems (Roberts et al., 2016).

Conceptual/theoretical framework

The theory of planned behavior (TPB) served as the theoretical framework for the study as it specifies cognitive antecedents of behavior. The TPB states that behavior is guided by attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). When these three constructs are measured as aggregates, they represent a more valid measure of the underlying behavioral disposition than any single behavior. To predict whether a person intends to do something (behavior), one needs to know whether the person is in favor of doing it (attitude), how much the person feels social pressure to do it (subjective norm), and whether the person feels in control of the action in question (perceived behavioral control) (Francis et al., 2004).

Methodology

This research employed a quantitative, non-experimental correlational design to study the relationships of psychosocial factors (attitude, subjective norms, and perceived behavioral control) as they relate to food waste behaviors and the demographics of college students. After IRB approval, a sample of intact courses during spring 2022 at the University of Arkansas was selected for the survey. The researcher developed the instrument of 40 items containing statements related to the constructs of TPB with Likert scales ranging from 1=strongly disagree to 4=strongly agree Cognitive interviews were conducted to ensure readability and pilot-tested with graduate students. Content validity was established with faculty knowledgeable of the constructs. Coefficient alpha (Cronbach, 1951) levels were used to determine internal consistency for instrument reliability. The instrument was administered in person and online, and data were analyzed using SAS statistical software (SAS Institute, Inc., 2013). Descriptive statistics and multiple regression were used to determine the correlation between variables.

Results/findings

The study population was students in the College of Agricultural, Food, and Life Sciences at the University of Arkansas in the spring 2022 semester. Of the 804 useable responses (96.3% response rate), more than half (78.6%) were female, with 36.0% sophomores, 29.6% freshmen, 19.5% juniors, and 14.0% seniors. Over half (55.5%) indicated they were responsible for preparing 50% or more of their meals each week, and slightly more than half (50.1%) eat out 1-2 times each week. Most students responded favorably to attitudes toward food waste behaviors. The highest mean score was for the statement, "I feel eating leftovers helps reduce food waste" (M= 3.54, SD=0.58), while the lowest item was "I feel guilty or bothered when I throw away edible food" (M=3.04, SD=0.75). Regarding subjective norms, the item "My parents encourage me to eat leftovers had the highest mean score (M=3.41, SD=0.67). The lowest mean score was "I feel socially pressured to reduce food waste" (M=2.22, SD=0.72). Respondents agreed with their ability to control food waste, agreeing, "I am confident that I can put the effort in reducing food waste" (M=3.22, SD=0.58). The lowest mean score was for the statement, "In my opinion, wasting food is unavoidable" (M=2.50, SD=0.73). Of food waste behaviors reported, respondents asked for to-go boxes, save uneaten food for leftovers, and plan meals before shopping. They disagreed with the item, "I take specific actions to prevent food waste." Gender was significantly correlated (p<.005) with attitudes (r=0.11) and subjective norms (r=0.10), while classification (r=0.12), frequency of takeout (r=0.-11), and preparing meals (r=-0.21) were significantly correlated with behavioral control.

Conclusions

Respondents generally had positive attitudes about food waste. They believed that wasting edible food contributes to food waste, yet it seemed they did not fully understand its implications or consequences. They disagreed with some statements that household food waste is harmful to the environment, or that it was a genuine concern. Regarding subjective norms, the respondents agreed that most people their age waste edible food, and their families think it would be a good idea for them not to waste food. This finding is consistent with other literature. Conflicting results indicate the respondents did not feel socially pressured to reduce waste, yet feel their friends expect them to reduce food waste. Respondents were confident they could reduce food waste and store food properly. However, there were conflicting responses about whether they could avoid food waste in their homes, even though they prepare more than 50% of the meals each week. This conflict may be a result of shared spaces of apartment living. Most felt that throwing away edible food was easy. While correlated to TPB constructs, gender, classification, takeout, and food preparations had weak linear relationships.

Implications//recommendations/impact

Further study on college students using a mixed-methods approach is recommended to seek clarity on specific questions where disagreement seems consistent on all TPB variables. To raise awareness and positively influence food waste behaviors, students need information regarding the environmental effects of food waste through messaging campaigns in dining facilities or food recovery programs to communicate the effects of food waste.

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Parental Perceptions of the Equine-Assisted Therapy Program in Mississippi

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Introduction

Parents who have children participating in therapeutic riding programs are often overlooked when assessing the level of satisfaction of such programs. Parental satisfaction is crucial when assessing the overall impact such programs have on its participants. However, information measuring the improvement of a child's developmental needs through therapeutic riding programs is lacking. Research has shown that therapeutic riding may increase the quality of life and developmental/growth needs for children with disabilities (Kids Health, 2021).

Developmental skills, such as cognitive, physical, social, and/or emotional challenges, can all be improved when children participate in equine-assisted interventions like therapeutic riding (Jacob et al., 2015). Several types of therapeutic interventions take place in private practices, schools, or even in an individual's home. Though not all children benefit from conventional therapies like as physical therapy, occupational therapy, and speech therapy, therapeutic riding programs are a unique experience for children with disabilities as a therapeutic intervention (WindReach Farm, 2019).

Without knowledge regarding the level of satisfaction parents have about their child's participation in therapeutic riding programs, how does one know if such programs are meeting the needs of these children? If parents are not satisfied with their child's development in such programs, then the number of participants in such programs may decrease or most importantly, the developmental needs of children with disabilities may not improve.

The purpose of this study was to describe the perceptions of parents whose children have participated in an equine-assisted therapy program conducted at Mississippi State University. Specific objectives of the study were 1) describe why parents chose equine-assisted interventions for their child, 2) describe their child's development before and after participation in the program, and 3) describe their levels of agreement on the following areas of parental satisfaction: developmentally appropriate care, family centered care, coordinated care, technical competence, and interpersonal competence.

Conceptual Framework

The Multidimensional Assessment of Parental Satisfaction (MAPS) (Ireys & Perry, 1999) guided this study. This developmental and evaluation tool uses five dimensions of care that pertains to parental satisfaction with providers including developmentally appropriate care, family-centered care, coordinated care, technical competence, and interpersonal competence (Ireys & Perry, 1999). While the number of children with disabilities is increasing, there is a warranted need for data on the satisfaction of programs in which children are placed (Ireys & Perry, 1999). Parental satisfaction is often overlooked and is yet important when measuring a child's development (Kittredge, 2020). Satisfaction can be measured and compared across different varieties of disabilities and can play a unique role for personal appraisal that cannot be abstracted from data or care directly (Ireys & Perry, 1999). While children participate in programs like therapeutic riding, they need to excel in their targeted skills as they grow and learn. If a program is lacking parental satisfaction, it can take a toll on a child's development and growth, so examining the needs for parental satisfaction is rather important in school or therapy settings (Kittredge, 2020).

Methodology

An electronic survey was sent to 22 parents whose children participated in the Mississippi State University Equine-Assisted Therapeutic Riding Program with 50% ($f = 11$) of them completing the survey. The therapeutic riding program was inactive at the time of data collection due to COVID-19 restrictions, so email was the only way to contact parents. Parents were asked an open-ended question for them to identify the reasons their child participated in equine-assisted therapy programs. Next, parents were asked to rate their child's growth and development before and during participation in the equine-assisted therapy programs using the scale 1 = Far Below Average to 5 = Far Above Average. Lastly, parents were asked to rate their child on the five constructs recommended by Ireys & Perry (1999) on an evaluation instrument developed by Kerr (2021) for measuring parental satisfaction in equine-assisted therapy programs. Each construct contained Likert-type statements where parents used the scale 1 = Strongly Disagree to 5 = Strongly Agree to rate each statement. Means and standard deviations were used to summarize and describe data.

Results

Three themes surfaced when identifying reasons why parents chose equine-assisted therapies for the child. Those themes were: 1) parent being interested in local equine-assisted therapy programs, 2) the benefits the therapeutic riding program provided to their child's needs, and (3) the love of animals. Before participation in the program, parents indicated their child was "somewhat below average" in their social interaction skills, communication skills, motor skills, hand-eye coordination, and self-esteem. After the program, parents held an improved, though neutral perception, on each of the five developmental areas. When asked to rate the constructs on their level of parental satisfaction with the program, "Technical Competence" was the highest-rated construct ($M = 4.68$, $SD = .41$. The lowest-rated construct was "Coordinated Care" ($M = 3.45$, $SD = 1.02$).

Conclusions

Parents placed their children in the therapeutic riding programs because their children love animals, particularly horses. Furthermore, information within the community indicated this program was good for children with special needs. Even though there were limited therapeutic interventions in the area for children, parents felt this program was more beneficial for their child when seeking other options. Before participating in the program, children were below average in social interaction, hand-eye coordination, and communication. Even by participating in the programs, communication was still a concern for children in the program. Overall, parents were the most satisfied with the technical competence of the program staff followed by the staff making sure the activities were developmentally appropriate for the children.

Implications/Recommendations

While parents are satisfied with the program, staff members delivering the program could be more personable and interactive with parents. Furthermore, staff members should develop a relationship with local and state health care providers who recommend therapeutic services. Once the limitations of the COVID-19 pandemic subside, additional data should be collected to determine if parents are still satisfied with the program.

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Personal Agricultural Literacy: Auburn University Students' Label Identification and Response

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Personal Agricultural Literacy: Auburn University Students' Label Identification and Response

Frick et al. (1991) established that an agriculturally literate person can "synthesize, analyze, and communicate basic information about agriculture" (p. 52). Whether consumers are actively intaking content through chosen methods or indirectly consuming content through other mediums, they engage with terminology that challenges or interacts with their current level of agricultural literacy (Durham et al., 2009; Murray et al., 2020). Assessments on agricultural literacy can take many different forms; previous assessments among college students have included knowledge tests as well as attitude analysis (Dale et al., 2017; Ruth et al., 2016). The Knowledge Gap Theory asserts that news or content diffuse differently depending on the person who is receiving it (Tichenor et al., 1970). This study, using Knowledge Gap Theory, investigates the potential correlation between familiarity, favorability, and knowledge of agricultural terminology or labels.

This study surveys 28 Auburn University students to identify their familiarity with food labels and terms, their attitude towards them, and knowledge about them. Participants completed a hardcopy version of the survey where they were given five labels (smart-sourced, locally grown, organic, sustainably produced, and climate-smart food) to indicate their familiarity or nonfamiliarity with. Students are then asked their attitude toward the labels set to a Likert Scale where the true limits of the scale are: 5 - 4.51 = Very Positive; 4.5 - 3.51 = Somewhat Positive; 3.5 - 2.51 = Indifferent; 2.5 - 1.51 = Somewhat Negative; and 1.5 - 1 = Very Negative. Out of these five labels, only locally grown ($n = 27$, 96.40 %) and organic ($n = 26$, 92.90 %) were identified the most, while the highest level of sentiment was towards locally grown ($M = 4.71$, $SD = .54$) and sustainably produced ($M = 3.86$, $SD = .88$) (Table 1).

Table 1

Responses to Labels (n=28)

	Identification of label		Sentiment towards label [a]	
	f	*%*	*Mean*	*SD*
Locally grown	27	96.40	4.71	0.54
Organic	26	92.90	3.61	0.88
Sustainably produced	14	50.00	3.86	0.97
Smart-sourced	10	35.70	3.21	0.79
Climate-smart food	4	14.30	3.50	0.92

[a] 5 = Very Positive, 4 = Somewhat Positive, 3 = Indifferent, 2 = Somewhat Negative, and 1 = Very Negative

Students were also prompted to answer questions about each of the terms on a knowledge test; each question pertained to a term, respectively (Table 2). The question that addressed the difference between "organically grown" and "organic certified" was question with the highest number of correct answers at 64.30% ($n=18$). However, the answer with the lowest number of correct answers was the question that addressed what "climate-smart agriculture" refers to, with only three participants answering correctly.

Table 2

Correct Responses to Knowledge Questions

Question	f	$\%$
What is the difference between "organically grown" and "organic certified"?	18	64.30
What does "sustainable agriculture" indicate?	15	53.60
"Organically grown" food in the United States means	11	39.30
How many miles does "locally grown" indicate?	4	14.30
"Climate-smart agriculture" refers to the following	3	10.70

Note: $n = 28$

Although participants did indicate a familiarity and positive attitude towards multiple terms, participants incorrectly answered at a high rate to the knowledge test questions, demonstrating a lack of understanding. For example, while 96.4% of students ($n = 27$) identified the term "locally grown" and their sentiment towards it was positive ($M = 4.71$), only 14% of participants ($n = 4$) scored correctly on the corresponding knowledge question. Participants did identify Organic with highly familiarity as 92.90% of students ($n = 26$) and relatively high favorability ($M = 3.61$). The question on the knowledge test that was answered correctly the most at 64.30% ($n = 18$) was the one that asked the difference between organically grown and organic certified. However, when asked what organically grown means, only 39.30% of students answered correctly ($n = 11$). This indicates that the majority of the students recognize and favor organic as a term but may have difficulties understanding what it means and how it relates to the official certification of organically grown produce.

Future assessments could include questions on news intake or method of news to determine where and how participants interact with agricultural literacy along with questions that ask students to self-evaluate their level of agricultural literacy. A content analysis portion of the survey could be added, with participants engaging with news articles and providing their responses to the label information provided. Knowing the levels of agricultural literacy that college students have, as well as how they are challenged, will be helpful in determining the effectiveness of source contents.

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Rewriting the Rural Narrative: A Media Analysis and Community-based Comparison

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Introduction

Rural communities are vital to agriculture, energy, recreation, and the innerworkings of society (Ajilore & Willingham, 2019). Despite their importance, rural communities have been left out of federal policy, suffer from persistent poverty, and have limited access to things like healthcare and broadband internet (Cromartie, 2018). Rural communities are often described as bleak, lacking diversity, and stagnant (Ajilore & Willingham, 2019; Reed, 2020). These descriptions and the conversations had about rural communities very rarely include actual rural community residents (Aljore & Willingham, 2019). As rural revitalization efforts strive to make rural communities more sustainable, the narrative and story of rural communities must be understood. We must also understand how the negative external narrative about rural places impact the sustainability and leadership of these communities. There is a strong need to share stories of effective rural leadership to shift the narrative from one of dissolution to prosperity, hope, and opportunity. The purpose of this two-part project was to better understand the narrative of rural leadership being told about and by rural Oklahoma. This project was conducted through the Rural Renewal Initiative, a research initiative at Oklahoma State University, committed to conducting interdisciplinary, placed-based research to catalyze the renewal of rural communities in Oklahoma and beyond. The guiding questions for this research were: 1) What is the current leadership narrative of Oklahoma's rural communities as told by media? and, 2) What are the leadership narratives of Oklahoma's rural communities?

Conceptual and Theoretical Frameworks

Community capitals framework (Emery & Flora, 2006) and adaptive leadership (Heifetz et al., 2009) guided this study. The seven community capitals (human, social, cultural, financial, political, built, and natural; Emery & Flora, 2006) helped us understand how media portrayed the assets of rural Oklahoma. Adaptive leadership (Heifetz et al., 2009) provided the lens for us to find meaning in the leadership narratives by understanding the adaptive nature of challenges and adaptive leadership behaviors prevalent in the community.

Methods

The analysis unit for part one of the study to empirically assess the media coverage of rural Oklahoma was media articles from the last five years (2017 – 2022) obtained through the Factiva database. The search criteria used were two mentions of both rural and Oklahoma, generating 1,443 articles. A sample of 304 articles were randomly selected. A content analysis protocol was created using recommendations from Krippendorff (2013) and Riff, et al. (2013). The protocol was reviewed by two content analysis experts external from the author team to ensure validity. Two coders were trained to use the 20-item codebook. Three items were factual, while the 17 remaining variables required interpretation. Interrater reliability was conducted on 20% of the sample and Cohen's Kappa was used to measure agreement on an item basis. An acceptable level for 20% of the sample is .70 (Riff et al., 2013). Factual items had a Cohen's kappa score of 1.0 and interpretive items scores ranged from .96 to .78. An inductive qualitative approach (Patton, 2015) guided part two of the study, in which semi-structured interviews were conducted with 10 rural community members to understand their perspective of leadership in their rural community. We rooted the interview protocol in appreciative inquiry (Michael, 2005), as it "looks to create an energy, a renewed commitment to change and a sense of hope among the groups of people working to achieve [a positive] future" (p. 222). Data were coded using in-vivo and pattern

coding (Saldaña, 2016), during round one and two respectively, to establish themes. Lincoln and Guba's (1985) criteria for trustworthiness were followed through prolonged engagement with the data, multiple peer debriefing sessions, the use of members' voices, field data and notes, coding audit trails, and analytic memos.

Results/Findings

Of the 304 media articles, 46.4% ($n = 141$) were deemed to be irrelevant to rural Oklahoma and were not coded further. Therefore, 163 articles were considered relevant. Of those articles, 28.6% ($n = 87$) of them were positive, 25.8% ($n = 42$) were negative, and 20.9% ($n = 34$) were neutral. Articles were also coded for types of leadership. About six percent ($n = 10$) of articles did not mention leadership at all. Articles were also coded for mentions of community capitals. The two most frequently mentioned were human capital (76.7%; $n = 125$) and political capital (68.1%; $n = 111$). Two major themes emerged from the interviews. The first theme, *why leadership is needed,* included the sub-themes of *generational changes, contradictory views of involvement,* and *internalized narratives of their community.* One participant encompassed this theme through the statement: ". . . a lot of people still believe that rural people are ignorant and uneducated. I don't think people who aren't from rural communities generally have a great opinion of rural people." The second theme, *what leadership looks like,* was comprised of the sub-themes *shared purpose, leader behaviors,* and *leader attributes.* Another citizen shared this sentiment: "Our greatest strength is our ability to serve one another. You see it all the time, people stepping in to help one another."

Conclusions/Discussion/Implications

In the media narratives, human and political capital were mentioned more frequently compared to other community capitals. Although many of the articles pulled from the database were irrelevant to rural Oklahoma, articles were more likely to be positive than negative in tone. Many of the articles were not relevant to rural Oklahoma, suggesting the chosen database was not able to retrieve all accessible articles written about rural Oklahoma and potentially excluded local, small-town newspapers. Future research should begin with refining search terms for accuracy and precision (Stryker et al., 2006). The narratives of community members themselves revealed most community leadership needs can be identified as adaptative challenges (Heifetz et al., 2009), as most discussed were associated with community culture and values. Additionally, many leaders in the community exhibit adaptive leadership behaviors (Heifetz et al., 2009) by seeing the big picture of community challenges and bringing a variety of perspectives to the table. Shared leadership organically emerges and should be highlighted as an asset of the rural community. In comparing the media narrative portrayal of rural Oklahoma and the leadership narratives of a rural community itself, the internalized narratives of the community do not seem to be present in media. Also, although shared leadership was described most in the community, media narratives tended to focus on individual, political and organization-based leadership. While group leadership is mostly talked about within the community the media did not seem to focus on that form of leadership in rural Oklahoma. Social and community capitals appear to be most essential for effective leadership in rural Oklahoma. Further exploration into community storytelling could possibly help identify and address the source of the internalized community narratives. Extension leadership development efforts should help rural communities assess the cultural and social aspects of challenges and help develop avenues to share their positive leadership narratives.

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School-Based Agricultural Education Teacher Aspirants Interest in CASE Curriculum Training to Support Early Career Success

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School-Based Agricultural Education Teacher Aspirants Interest in CASE Curriculum Training to Support Early Career Success

Introduction

School-based agricultural education (SBAE) continues to face numerous challenges, although the greatest continues to be the preparation of qualified teachers (Eck & Edwards, 2019). Roberts et al. (2009) identified the primary predictors related to an SBAE teacher aspirants' intent to teach was their teacher preparation program and their motivation to teach prior to their clinical teaching experience. A primary factor within motivation to teach lies within a pre-service teacher aspirants' self-efficacy (Sylvia & Hutchinson, 1985). The desire for self-efficacy within the SBAE teaching profession stems from the "increased emphasis on student and teacher performance" (Roberts & Dyer, 2004, p. 82). This increase emphasis or expectation often leads to teachers leaving the profession, as nearly 40% of teachers leave within the first two years (Marlow et al., 1997).

Properly preparing teacher aspirants can help temper these concerns (Gilad & Alkalay, 2014), as the need to satisfy career demands necessitates SBAE teachers to draw on appropriate knowledge and skills (Roberts & Dyer, 2004). When considering first year teachers, self-efficacy related to needed content knowledge is often low, leading to an ongoing struggle to deliver relevant learning experiences (Burris et al., 2010). Thus, faculty in Agricultural Education at Oklahoma State University (OSU) decided to implement a new course focused on classroom and laboratory teaching methods in the context of Curriculum for Agricultural Science Education's (CASE) *Introduction to Agriculture, Food and Natural Resources* (AFNR) curriculum. Therefore, this study aimed to evaluate the current perceptions and interest of this of SBAE teacher aspirants at OSU related to this optional elective course.

Theoretical Framework

This study was grounded in the theory of planned behavior (TPB; Ajzen, 1991). As TPB considers the attitude, norms, and perceived control related to an individual's intention toward a behavior (Ajzen, 1991). Within this study, the behavior is participating in a pre-service course providing CASE curriculum certification, ultimately leading to the integration of CASE curriculum as a future SBAE teacher. One of the primary factors within this study relates to a SBAE teacher aspirants' attitude toward the behavior, as behaviors can be favorable or unfavorable depending on outside factors, including subjective norms and perceived behavioral control (Ajzen, 1991). Therefore, an SBAE teacher aspirants' intention toward integrating a STEM enhanced curriculum (i.e., CASE) in [State] was essential as currently less than 2% of SBAE teachers in [State] are certified to deliver CASE curriculum (CASE, 2022).

Methodology

SBAE teacher aspirants preparing to student teach during the 2023 to 2024 school year at OSU (N = 43) were asked to scan a QR code and complete a questionnaire if they were interested in CASE curriculum. Twenty-one (48.8%) students responded to the five-item questionnaire, answering items related to their interest and experience with CASE curriculum and STEM

integration as they consider their future career. Pertinent demographics gathered SBAE teacher aspirants' gender, academic year, previous exposure to CASE and SBAE, and intent to teach. The questionnaire was developed following the recommendations of Dillman et al. (2014) and was evaluated for face and content validity by Agricultural Education faculty members at OSU prior to distribution. SPSS version 28 was used to analyze descriptive statistics.

Results/Findings

Fifteen of the 21 respondents were female, but none of the respondents had previous exposure to CASE curriculum, although all of them had a secondary agricultural education experience. Seven were in the second semester of their junior year, with the remainder being in the first semester of their junior year. All 21 participants currently plan to enter the SBAE teaching profession. When asked if they were interested in taking a semester long course preparing them to teach CASE, all responded yes, with 95% ($n = 20$) having reported a willingness to integrate CASE during their clinical teaching experience. Participants expressed interest in CASE because of its ability to help them "learn more about effective teaching" and "provide a high quality and up to date curriculum". They further explained the connections "CASE provides to national standards and STEM are important as the opportunities within the agriculture industry are endless and creating a learning environment to prepare students for the future is essential." Additionally, 20 of the participants expressed interest in highlighting STEM in agriculture as future teachers. Expressing that "it is essential to add STEM into lessons so that students can connect agriculture to real world scenarios."

Conclusions/Implications/Recommendations

Nearly half of the students within SBAE teacher preparation program at OSU expressed interest in a semester long CASE AFNR focused course, with the majority (71.4%) being female. The gender breakdown was representative of the OSU program and with the course being an option/elective within a 120-credit hour program, the level of interest seemed appropriate. Of the study's participants, 95% expressed interest in integrating the curriculum into student teaching and their future SBAE programs, as they felt that the course would help them improve "content and teaching knowledge." Aligning with the need for both of those skills to be effective SBAE teachers (Roberts & Dyer, 2004), ultimately impacting their self-efficacy (Sylvia & Hutchinson, 1985). All of those who participated, indicated a current plan to enter the SBAE profession, reducing the barrier of being motivated to teach (Roberts et al., 2009). Overarchingly, this newly developed course, along with motivated students, should help to produce well prepared teacher aspirants (Gilad & Alkalay, 2014), prepared to tackle current SBAE demands, hopefully offsetting the current trend of teachers exiting the profession (Marlow et al., 1997).

It is recommended that future research studies explore the impact of such a course on SBAE career preparedness, self-efficacy, and career tenure. OSU faculty are encouraged to continue monitoring SBAE teacher aspirant preparedness and self-efficacy as it relates to the student teaching experience, career entrance, and career tenure, adjusting as needed. SBAE teacher preparation faculty nationwide should consider the impact their coursework has on early career success and the potential impact of such a course.

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Science Communication Training Workshop for College of Agriculture Master's Students

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Introduction

Historically much of science communication has relied on the knowledge deficit model, but that model has been inadequate for addressing societal problems, partly because of the lack of scientists' science communication skills (Brownell et al., 2013; Longnecker, 2016; Simis et al., 2016). Science communication trainings are needed, but there are no clear standards about what practices are most effective (Baram-Tsabari & Lewenstein, 2017). An important component of effective communication is trust, which is notable given increasing distrust in scientific institutions (Fiske & Dupree, 2014; Simis et al., 2016; Su et al., 2015). Improving scientists' communication skills can help extend the results beyond the scientific community, which also improves the reach of information *within* the scientific community (Simis et al., 2016).

Conceptual Framework

Storytelling is a key aspect of effective science communication (Bray et al., 2012), which can be addressed through the Narrative Paradigm. One of the key problems with the knowledge deficit model is that it assumes people are rational, while the narrative paradigm shifts focus from rationality of the audience to rationality of the story being told (West & Turner, 2018). Narrative rationality consists of coherence (i.e., internal consistency of the story) and fidelity (i.e., trustworthiness of the story), which is then evaluated by the audience. Facts and logic are still present, but it takes into account the context of the audience, which is an area that scientists often omit or underestimate in their communications (Besley & Tanner, 2011; Brownell, 2013).

Methods

Two 6-hour science communication trainings were conducted in the spring of 2022 for master's students in a college of agriculture as a pilot. The trainings focused on translating research for public audiences, working with professional communicators, being interviewed, maintaining an online presence, and practicing a three-minute thesis presentation. Participants completed a preflection before the first session asking about how they defined science communication, examples of science communication they have seen, their expectations for the trainings, and their motivations for joining the training. At the conclusion of the session, the completed a reflection about their experience that day, what they learned, and how the training could be improved for the next session. The preflection before the second session asked about changes in perceptions of science communication since the first session, examples of science communication they had seen since the first session, and if their perceptions had changed of the training. They completed a reflection at the end of the second session about their experience that day, what they had learned, and how the training could be improved for future iterations. There were 12 participants in the program. Participants were emailed an IRB consent form requesting permission for their reflections to be used for research, and the seven who were completed them were analyzed. The constant comparative approach was used to analyze the reflections (Glaser, 1965).

Results

In the first preflection, participants considered science communication as sharing and educating about research ("Working to educate others in research based facts and information."). In the second preflection, responses shifted to talking about relevance and importance of science communication ("I better understand the importance of researchers being able to communicate in this way."), as well as the importance of relationships ("I would say I better understand the importance of building relationships with communication professionals instead of trying to do things on my own.") and modes of science communication ("I knew there were many modes of media available, but the variety and thought that goes behind each one is impressive.").

Going into the first session, they were expecting to improve how they communicate about research, improve how they distill information for others, and how to work with the media ("Gain tools and skills necessary to improve the clarity and adaptability of the way I talk about my research, and science more generally."). They were motivated to participate so they could improve their communication skills, share their research, and bridge the gap between the public and the scientific community ("I saw that there is sometimes a communication gap between the public and scientific community that needs to be filled"). They said they had learned to present information in a conversational manner and make the research impactful to others ("It was very impactful to know that others are interested in my research and want to share it with others").

In terms of how sessions were run, they enjoyed the experience and working through pitching their research step-by-step ("I really enjoyed getting to work through pitching the story of my research step-by-step and working up to the interviews at the end."), but they believed sessions could be improved with more time for activity sessions, more feedback from the communicators at their tables ("What was more helpful for me was the feedback from the communicators at our table listening to our pitches and helping us work through each step."), and rotating which tables they sat at to learn more about others' research ("I really liked the group I worked with but I am also curious to know what other people are studying."). In reflecting on the second session, participants continued to have positive perceptions, including noting improvement in how things were paced ("I think it was incredibly helpful and much better paced today than the first session."). Maintaining an online presence as a researcher was a new topic for many of the participants ("I am not very active on social media but learning that it can be a tool to promote yourself to prospective employers will make me take it seriously."). Overall, they enjoyed the hands-on activities and small-group settings that fostered dialogue and feedback with the communicators and between participants ("Overall both sessions were great. The talks and experiences were great and the hands-on activities were wonderful and helpful.").

Conclusions

One of the key findings is the shift in perspective on what science communication was in terms of its goals. Participants shifting from thinking of science communication as merely sharing information to one of building relationships and audience-centered focus, which is a key component of the Narrative Paradigm (West & Turner, 2018). Overall, the program was well-received, which is beneficial given scientists' overall lack of science communication skills (Brownell, et al., 2013; Longnecker, 2016; Simis et al., 2016). While there are no clear standards for what should be included in science communication training programs (Baram-Tsabari & Lewenstein, 2017), this project gives early indications that hands-on practice and direct feedback from practicing communicators is beneficial to learners' experiences.

Recommendations

Future science communication trainings can be informed by the program results, particularly the emphasis on hands-on practice, feedback from professionals, and an audience-centered focus for the sessions. The project having multiple sessions also allowed participants to process information before getting to apply the information again, as opposed to a one-off program. Because this was a pilot, further implementations are needed to best understand what should be included in science communication trainings (Baram-Tsabari & Lewenstein, 2017). This training was limited to a specific population at a specific college of agriculture. Similar trainings and assessments of those trainings should occur with different audiences, such as undergraduate researchers and faculty members, as well as in different locations across the country.

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Social Network Analysis of an Agricultural Leadership Program

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Social Network Analysis of an Agricultural Leadership Program

Introduction/Need for Research

Social networks can be described as structures consisting of individuals (nodes) and their relationships (ties) (Li, 2013). Cullen-Lester et al. (2017), acknowledge the importance of social networks in a "collective's ability to produce leadership" (p. 146). Therefore, leadership development must address relationships in the targeted group. Van De Valk and Constas (2011) found that leadership development programs (LDPs) frequently suggest that participants may increase their networks through program participation. However, a critical analysis of the limited published research revealed inadequate evidence to support causal inference between change in network and LDP participation. The authors advocated for improved LDP evaluation (Van De Valk & Constas, 2011). Hoppe and Reinelt (2010) called specifically for the use of social network analysis (SNA) to evaluate LDPs. Moreover, Cullen-Lester et al. (2017) identified a dearth of research on the development of collective leadership networks. Therefore, the purpose of this study was to explore the network of an LDP cohort before and after the program.

Conceptual or Theoretical Framework

Social network analysis (SNA) applies a structural approach to studying the interaction among social actors in a network (Freeman, 2004). This approach is "grounded in the intuitive notion that the patterning of social ties in which actors are embedded has important consequences for those actors" (Freeman, 2004, p. 2). The emphasis of the research is on the characteristics of the structure, rather than the individual nodes and ties. There are two fundamental approaches to network analysis, whole-network analysis, and personal or ego network analysis. This research utilized whole-network analysis, which explored the ties among all pairs of nodes in the network.

Methodology

We used SNA to investigate network changes of one agriculture and natural resources (ANR) LDP cohort. Specifically, we sought to characterize the structure of the network by understanding the ties between each set of participants in the cohort. We administered a reflective-pre and post survey to participants via Qualtrics at the conclusion of their LDP. Participants indicated the frequency with which they initiated interaction with each of their classmates in their role as an industry leader at both the beginning and end of the program. We used a five-point scale with indicators of never, once or twice a year, once or twice a month, at least weekly, and daily. We exported the data from Qualtrics into Microsoft Excel to be cleaned and recoded. Participant demographics, or attributes in SNA, were also collected including age, gender, industry sector, and geographic region. Data was imported into UCINET for analysis, and whole network statistics were calculated. Data was then visualized using NetDraw.

Results/Findings

Participants in the Resource Education & Agricultural Leadership (REAL) Oregon program travel to different locations across the state once per month for five months, developing leadership skills and learning about Oregon's agriculture and natural resources (REAL Oregon, 2021). The program cohort consisted of 23 leaders from five agricultural industries. Nine from production agriculture, three from forestry, two from transportation, seven from agricultural support, and two from education. Twelve participants identified as female and eleven as male,

with ages ranging from 28 to 60 years old. We calculated whole-network measures to characterize the cohesiveness of the cohort. Number of ties represents the total number of ties between nodes in the network and average degree indicates the mean number of ties each node reported. The number of ties in proportion to the number of ties possible indicates the density of the network, while connectedness is the proportion of pairs of nodes that can reach each other by some path, no matter how long. Finally, the degree of centralization represents the extent to which the network centers around a single node. Pre- and post- program whole network characteristics can be seen in Table 1.

Table 1
Whole Network Measures Pre vs Post Program

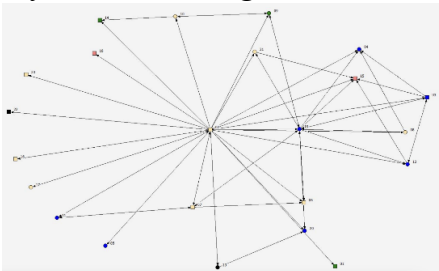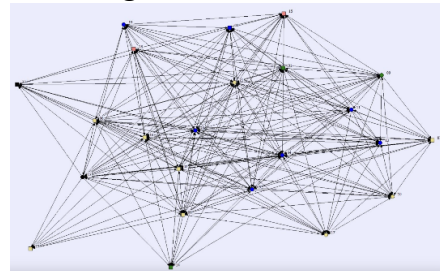| Whole Network Measures	Pre-Program	Post-Program
Number of Ties	52	329
Average Degree	2.261	14.304
Density	0.103	0.650
Connectedness	0.439	0.870
Degree of Centralization	0.909	0.190

Figure 1
Reflective-Pre Program Network

Figure 2
Post Program Network

Conclusions

We identified changes in the whole network of the program cohort from the beginning of the program to the end. Cohesiveness of the class increased, indicating that classmates developed new relationships with one another over the course of the program. Moreover, centralization of the network decreased, such that connections were more evenly distributed across pairs of nodes rather than any one participant being a central figure in the network.

Implications/Recommendations

ANR LDPs aim, in part, to expand the leadership capacity of the industry by developing collective leadership among cohorts of leaders. Our research suggests that LDP cohort networks can increase in cohesiveness over the course of the program. Increased cohesiveness among ANR leaders may lead to leadership approaches that consider a more holistic view of the industry. Moreover, information and resources can be shared more comprehensively and quickly in a decentralized network. We recommend that ANR LDPs continue developing leaders and the leadership capacity of the industry. Additional research should seek to establish causal inference between network change and program participation. Furthermore, this study should be replicated with additional classes in other programs. Finally, a qualitative inquiry may uncover meaningful insight into the nature of relationships developed through ANR LDPs.

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Statistical Power in the *Journal of Agricultural Education*, 2012 – 2022

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Statistical Power in the *Journal of Agricultural Education*, 2012 - 2022

Statistical power has been defined as the probability of finding a statistically significant result with an inferential statistical test when an effect actually exists in the population (Turner & Houle, 2018). Stated differently, statistical power is the probability of avoiding a Type II error, which occurs when a researcher fails to reject the null hypothesis when the null hypothesis is false in the population (Glass & Hopkins, 1996). Statistical power increases as sample size gets larger, the alpha level of the statistical test increases (i.e., from .05 to .10), and when an amplified magnitude of the effect occurs in the population (Glass & Hopkins, 1996). While the latter method of increasing power is outside the direct control of the researcher, the first two can be controlled. Cohen (1988) recommended a minimum power of .80 when conducting inferential statistical tests. However, because increasing the alpha level directly increases the probability of committing a Type I error (rejecting a true null hypothesis), the preferred method of increasing statistical power is to increase sample size (Turner & Houle, 2018).

Theoretical Framework

This research was framed using Ajzen's (1991) Theory of Planned Behavior (TPB). According to the TPD, an individual's decision to engage in a specific behavior depends on their attitude, their subjective norms, and their perceived behavioral control related to the behavior. This research aims to increase the profession's positive attitudes, subjective norms, and perceived behavioral control toward the intended behavior of increased consideration of statistical power when planning and conducting research employing inferential statistics.

Purpose

The purpose of this study was to determine the statistical power (at the small, medium, and large effect sizes) for inferential statistical tests reported in articles published in the *Journal of Agricultural Education* (*JAE*), 2012 – 2022.

Methods

The researchers manually examined each published article in *JAE* between 2012 and 2022, inclusive, and identified all articles where inferential statistics were used. A coding sheet was developed, and the following data was collected for each inferential statistical test reported; the specific statistical tests used, the total number of subjects included in each analysis, the number of subjects per group, and the stated alpha level. For multiple regression, the number of predictor variables in the model were also recorded, and for MANOVA, the number of dependent variables was also recorded. G*Power Version 3.1.9.2 (Faul et al., 2007) software was used to calculate the statistical power for each inferential statistical test at the small, medium, and large effect sizes as summarized by Kotrlik et al. (2011).

Results

Seventy inferential statistical tests (See table 1) were reported in *JAE* for the 11 years between 2012 and 2022. The most frequently reported tests were bivariate correlations (27.1%), independent *t*-tests (24.6%), and one-way ANOVAs (22.9%), while one-way MANOVAs

(2.9%), and bivariate regression (1.4%) were the least commonly reported inferential statistics. At the small effect size, mean statistical power ranged from 0.101 (one-way MANOVA) to 0.625 (paired *t*-test), while at the medium effect size, mean statistical power ranged from 0.310 for factorial ANOVA to 0.989 for paired *t*-tests. Lastly, at the large effect size, mean statistical power ranged from 0.680 (factorial ANOVA) to 1.0 for both paired *t*-tests and bivariate regression.

Table 1

Descriptive Statistics for Mean Power by Test and Effect Size

		Effect size					
		Small		Medium		Large	
Statistical Test	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Independent *t*-test	17	0.314	0.300	0.667	0.332	0.867	0.214
Paired *t*-test	4	0.625	0.305	0.989	0.019	1.000	0.000
One-way ANOVA	16	0.349	0.307	0.784	0.219	0.964	0.068
Factorial ANOVA	3	0.086	0.007	0.310	0.024	0.680	0.012
One-way MANOVA	2	0.101	0.019	0.436	0.095	0.855	0.068
Factorial MANOVA	4	0.428	0.438	0.650	0.433	0.778	0.374
Multiple regression	4	0.415	0.388	0.931	0.076	0.999	0.001
Bivariate correlation	19	0.333	0.291	0.861	0.192	0.986	0.039
Bivariate regression	1	0.346	-	0.990	-	1.000	-

Conclusions and Recommendations

For small effects none of the tests reached the minimum recommended statistical power of 0.80 (Cohen, 1988). The mean power for independent *t*-tests, one-way ANOVA, factorial ANOVA, one-way MANOVA, and Factorial MANOVA were less than the recommended statistical power at the medium effect size; however, paired t-tests, multiple regression, and bivariate regression all had power greater than .80. At the large effect size, factorial ANOVA was the only statistical test reported with a mean power less than Cohen's recommendation. Overall, tests reported in *JAE* between 2012 and 2022 were capable of detecting large effects at an acceptable level, however were less effective for medium and small effects. Researchers should consider statistical power as studies are planned and select appropriate sample sizes to ensure acceptable power for the anticipated effect size. Additionally, researchers should report statistical power for all inferential analyses. This would enable other researchers to determine if reported non-significant differences were due to no effect in the population or low statistical power

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Teacher Confidence in Instructional Methods

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Teacher Confidence in Instructional Methods

Introduction/Theoretical Framework

Engaging students through effective instructional methods impacts student success (Hunt et al., 2009). The AAAE's research agenda surrounding meaningful, engaged learning asks how educational program delivery in agriculture can evolve to meet the needs and interests of students (Roberts et al., 2016). To address this question, teachers must have a specific set of characteristics, including the ability to offer instruction in a variety of methods (Hunt et al., 2009). Rosenshine and Furst (1971) are known for their research on effective teaching. In their work, they listed variability in instruction as one of the fundamental characteristics of effective teachers. To be able to offer variety in the classroom, teachers must have confidence in carrying out several instructional methods. According to Bandura (1997), people are more likely to engage in activities that they have more confidence in performing.

The purpose of this study was to examine teacher confidence in using instructional methods at different career stages, as recommended by Voges et al. (2020). Framed within Huberman's (1989) model of the professional life cycle of teachers, teachers are categorized as being novice (early), mid-career, and late-career. This theory describes teachers in the novice stage as focusing on their new role and tasks, while mid-career teachers are showing confidence in their teaching pattern. By late-career, teachers are expected to be comfortable in their careers. While these distinct qualities of each career stage exist, Huberman (1989) claims that progression through the career stages may not always be linear. Understanding teacher confidence helps identify areas that can be improved to effectively engage school-based agricultural education (SBAE) students for both preservice and practicing teachers, directly addressing an AAAE research priority.

Methodology

To accomplish the purpose of this study, a descriptive, cross-sectional survey design was employed as part of a larger study (Fraenkel et al., 2019). The population was all SBAE teachers in Texas who were members of the state agriculture teachers association ($N = 2,172$). A sample of 326 teachers was needed according to Krejcie and Morgan (1970), however this was doubled due to anticipated low response rates ($n = 652$). Random sampling was used to develop the list of sample participants. The questionnaire, used with permission from the original researchers (Smith et al., 2015), had six demographic questions and 10 questions in each of the following areas for each teaching method: training received, time spent using the method, perceived effectiveness of the method, and confidence in using the method for a total of 46 questions. The methods listed in Table 1 were included with a definition for reference from Newcomb et al. (2004). The instrument was accepted as valid and reliable as published in earlier studies surveying the same population (Smith et al., 2015; Voges et al., 2020). After obtaining IRB approval from Texas A&M-Commerce the questionnaire was distributed through Qualtrics with five total contacts through email, each one week apart (Dillman et al., 2014). A final response rate of 16.7% was achieved ($n = 109$). Means and standard deviations were calculated in Microsoft Excel for each group of teachers based on early, middle, and late career stages.

Findings

According to the findings, middle career teachers had the highest confidence when using four of the ten instructional methods (field trips, guest speakers, lecture, and role play). Mid-career stage teachers also had the lowest confidence in four of the ten methods (demonstration, discussion, experiments, and independent study). Confidence only showed linear progression through early, middle, and late career stages in two methods (cooperative learning and supervised study). Refer to Table 1 for mean confidence levels reported for using all 10 instructional methods by participants in early, middle, and late career stages.

Table 1
Confidence in Instructional Method Based on Career Stage (N=109)

Instructional Method	Early (1-5 yr)		Middle (6-15 yr)		Late (16+ yr)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Cooperative learning	3.95	0.96	4.00	0.85	4.18	0.78
Demonstration	4.32	0.66	4.21	0.56	4.43	0.58
Discussion	4.12	0.78	3.92	0.83	4.00	0.67
Experiments	3.33	1.03	3.21	0.94	3.38	0.95
Field trips	3.30	1.10	3.64	0.89	3.43	1.14
Guest speakers	3.32	1.09	3.64	0.81	3.42	1.23
Independent study	3.44	1.00	3.29	1.16	3.38	1.21
Lecture	4.11	0.72	4.29	0.70	4.00	0.84
Role play	2.18	1.10	3.00	1.13	2.60	1.24
Supervised study	3.47	1.04	3.50	1.05	3.67	0.84

Note. Scale: 1 = *Very Low Confidence* to 5 = *Very High Confidence*.

Conclusions/Implications/Recommendations

Findings confirm that progression through the professional teacher life cycle is not always linear, as described by Huberman (1989). It is important to revisit the professional life cycle and evaluate inconsistencies. While Huberman describes mid-career as being a time of confidence and experimentation, we found mid-career participants had the least confidence four of the 10 instructional methods when compared to participants in the early and late career stages. Similarly, teachers in the late career stage expressed less confidence than middle career teachers in four categories, showing a decrease in confidence in certain skills throughout the professional life cycle. While early career stage teachers are expected to be in a period of survival, they expressed greater confidence than middle career teachers in four methods. Are some early career teachers over confident? Recommendations for practice that could help improve lower confidence levels would be providing continual training and education specific to middle career teachers. Additionally, providing training in the two methods that teachers expressed the lowest overall confidence in, experiments and role play, could be beneficial for teachers in all career stages. Further research should investigate previous training received in instructional methods, and identify factors leading to lower teacher confidence, particularly in middle and late career teachers. A limitation of this study is the low response compared to the population size, limiting its generalizability. Therefore, this study should be replicated with the national population using increased efforts to encourage participant response.

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The Product is in the Training: Describing the Deficiencies in Agricultural Teacher Preparation Programs as Reported by Agricultural Educators

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Introduction, Purpose, and Objectives

Over the past few decades, the agricultural education profession has suffered a teacher shortage crisis (Hainline et al., 2015; Solomonson & Retallick, 2018; Solomonson et al., 2021). In 2021, over 996 positions were open and there were 84 unfilled full-time positions (Smith et al., 2021). Furthermore, there were 789 graduates from a teacher preparation program and 586 of them entered the agricultural education classroom (Smith et al., 2021).

Traditionally, the post-secondary agricultural teacher preparation program is the most fruitful source of highly qualified educators to fill open positions. The agricultural education program typically trains students in various agricultural content areas, educational psychology, agricultural student organizations, educational law, etc (Roberts et al., 2020). While these areas of training are critically important, many pre-service teachers and early career educators report feeling unprepared for the classroom (Figland et al., 2019). Ensuring that graduates of agricultural teacher preparation programs feel confident in their ability to successfully enter the agricultural education profession is critical considering over 50% of educators leave within the first five years (Solomonson et al., 2019).

This study aimed to assess agricultural educator's level of preparation on various duties of a teacher when they were in the early stages of their career. The following research objectives were assessed:

1.) Evaluate the preparation levels of agricultural educators to implement various duties of an educator when they were in the early stages of their career.

Theoretical Framework

The theoretical framework that guided this study is Bandura's (1994) self-efficacy theory. This theory defines self-efficacy as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 1). Utilizing this theory as the foundation for this study depicts how the preparation levels of agricultural educators in the early career stages affect their beliefs about their capabilities therefore affect their performance in the role.

Methods

The research study conducted utilized Qualtrics to administer a demographics and self-efficacy assessment to agricultural science teachers across [State A], [State B], and [State C] regarding the preparation levels of agricultural educators to implement various duties of an educator in the early stages of their career. The researchers utilized a descriptive correlational research design. Preparation levels of agricultural educators were evaluated utilizing a five-point Likert-type scale ranging from 1 = "Not Prepared at All" to 5 = "Extremely Prepared".

The instrument reliability was assessed post hoc using Cronbach's alpha and no reliability issues were found. A census was used to collect data which alleviated any sampling bias. A list of agricultural educators was developed, and it contained viable email addresses for

349 agricultural educators in [State A], 159 in [State B], 64 in [State C], and 503 in [State D] (N = 1,075).

According to Gay and Diehl (1992), a response rate of 10% is necessary for quality descriptive research. In this study, a response rate of 11.26% (n = 121) was achieved. Overall, partial responses that completed the survey portion but only part of the demographics portion were retained. There were (n = 109) full responses and (n = 12) partial responses. Furthermore, a MANOVA was used to ascertain any statistical differences among early/late respondents and no differences were found (Lindner et al., 2001).

Results, Conclusions, and Recommendations

Overall, the participating agricultural educators rated themselves as somewhat prepared or moderately prepared on all items when they were in the early career stage. In the FFA/SAE section, SAE Grants (M = 1.79, SD = .903), Grants for FFA (M = 1.97, SD = .948), and the Agricultural Experience Tracker (AET) (M = 1.97, SD = 948) were rated as the lowest areas.

In the classroom management items, the lowest rated areas were implementing IEPs (M = 2.41, SD = .963), Implementing 504 plans (M = 2.37, SD = 1.10), and managing bullying situations (M = 2.60, SD = 1.18). Furthermore, the lowest ranked items in the instructional area are Utilizing Gamification as a Teaching Method (M = 2.24, SD = 1.20), Utilizing Independent Study as a Teaching Method (M = 2.87, SD = 1.22) and Utilizing Work Based Learning as a Teaching Method (M = 2.62, SD = 1.14).

Overall, the participating educators reported that they did not feel adequately prepared for implementing SAE-based programing into their agricultural education classroom., record keeping with the AET, writing grants, implementing special education mandates, and utilizing various teaching methods. This is consistent with other published literature that shows that teachers often struggle with these issues in the early career stage (Touchstone, 2015).

The integration of most items listed occurred on a either a daily, weekly, or monthly basis. Even the items that teachers felt unprepared for as early career educators were regularly implemented. Currently, approximately 50% of teachers leave the profession within their first five years. This could largely be due to their lack of confidence in their abilities to perform as a quality teacher.

Recommendations for future practice should include supporting early career educators in the areas that they feel unprepared such as special education mandate implementation, SAE programing in agricultural education, and integrating various teaching methods into their classroom. This responsibility will largely fall on teacher preparation programs because of their fruitfulness in producing educators. As teacher preparation programs evolve to adapt to a changing society, meeting the needs of early career educators will be increasingly vital.

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The Struggle is Real: Identifying Prejudice and Discrimination Perceptions

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Introduction

Women hold 5.8% of CEO positions, 21.2% of board seats, 26.5% of executive and senior level management positions, and 36.9% of beginning and mid-level management positions (Catalyst, 2020). Over the past few decades, research on leadership and gender has grown. Historically, many of the studies on gender and leadership traits have been on how underrepresented women lead, particularly in positions of authority. These studies also examined potential reasons for this gender discrepancy (Haslam & Ryan, 2008). Kleihauer et al. (2013) recommended studies look at the leadership challenges of males as well to better understand the differences in the challenges faced based on gender. Broader examination is needed to understand barriers faced by all individuals as gender-roles shift and additional minority groups are recognized in the workplace. Therefore, the purpose of this study was to describe prejudice and discrimination perceptions of middle and upper managers.

This study addressed the National AAAE Research Agenda priority area 3: sufficient scientific and professional workforce that addresses the challenges of the 21st century (Stripling & Ricketts, 2016). Specifically, this study looks at perceptions of prejudice and discrimination among leaders in middle and upper-level leadership positions. Attracting underrepresented students into agricultural fields is identified as an area of struggle (Roberts et al., 2016). Thus, understanding the barriers faced by underrepresented leaders in industry can inform the process of attracting and retaining talent from underrepresented populations.

Conceptual Framework

The challenges women and minority groups in the workplace encounter when trying to obtain upper-level leadership positions are compared to a leadership labyrinth (Eagly & Carly, 2007). The labyrinth "conveys the impression of a journey riddled with challenges all along the way—not just near the top—that can and has been successfully navigated by women" (Northouse, 2016, p. 399). Prejudice and discrimination are key tenants of the labyrinth and result in prevention of individuals attaining leadership positions. Stereotypes contribute to prejudice and discrimination in the workplace. Stereotypes represent beliefs characterized by presumptions of a group in society, whether that group is separated by race, nationality, religion, age, gender, or something else that shares similarities with values and characteristics. Stereotypes are used to distinguish groups apart and can do so accurately and inaccurately (Gill, 2009). The opinions of others shape women and men, and as a result, they are seen as stronger and weaker than their counterparts in some circumstances. For instance, male leaders need to exhibit the characterization of strength, while female leaders must exhibit sensitivity and strength to be viewed as effective (Johnson et al., 2008).

Methodology

A quantitative survey method was utilized and the reported data was part of a larger study. The objective was to describe prejudice and discrimination perceptions of middle and upper managers. The questionnaire instrument consisted of 15 items adapted from the Workplace Prejudice/ Discrimination Inventory (WPDI) developed by James et al. (1994). A seven-point Likert scale was used with the range strongly disagree to strongly agree. Centiment paid recruiting was utilized to generate and collect data from sample members, who were in middle or upper management positions in organizations. Because respondent feedback through Centiment

is anonymous, directly targeting Fortune 500 employees was not possible. Thus, the sample included only respondents whose companies made $50 to $100 million annually. The sample was balanced for gender. Responses from 240 individuals matching the aforementioned criteria were gathered using a Qualtrics online questionnaire. James et al. (1994) reported a Cronbach's alpha of .93 suggesting internal consistency. The 15 WPDI items and participant demographics were analyzed and percentages reported.

Results/Findings

Respondents ranged in age from 25 to 65 with an average age of 43 with 124 male respondents (51.67%) and 116 females (48.33%). White was the largest ethnicity category which accounted for 82.08% of respondents followed by Black or African American (11.67%), Asian (3.75%), and other which self-reported as multi-racial, Hispanic, or Mexican American (2.08%). Sexual orientation was reported by 89.17% of respondents as heterosexual (82.92%), bisexual (2.50%), gay and lesbian (1.67% each respectively), and non-binary (.42%). Respondents reported working full-time in a professional career more than 25 years (22.92%), 21-25 years and 16-20 years (17.08%), 11-15 years (20.42%), 6-10 years (17.50%), and less than five years (4.58%). Respondents had worked for a minimum of one organization and a maximum of 15 organizations since starting their professional careers with a median of 3 organizations.

For the WPDI scaled items, groups referred to gender, sexual identity, and ethnicity. Of the 15 items, 50% of respondents perceived prejudice/discrimination for four items. Respondents perceived prejudice existed in their workplace with 32.08% strongly agreeing and 25.42% somewhat agreeing. While respondents strongly disagreed (41.25%) and somewhat disagreed (21.67%) with "where I work all people are treated the same." Respondents reported strongly agree (27.50%) and somewhat agree (39.17%) for "supervisors scrutinize the work of my group more than that of other groups." "At my present place of employment, people of other groups do not tell me some job-related information they share with members of their own group" was reported as strongly agree by 26.67% and somewhat agree by 27.92% of respondents. Respondents strongly disagreed (41.67%) and somewhat disagreed (24.17%) with "there is discrimination where I work."

Conclusions/Implications/Recommendations

Respondents perceived prejudice and unequal treatment in their workplaces. Respondents also perceived scrutiny of work at higher levels and less access to job-related information than other groups. However, they did not perceive discrimination in their workplaces.

The data reported summarizes findings from the WPDI and should be further analyzed to determine if relationships existed between WPDI items, gender, ethnicity, and sexual orientation. As indicated in the leadership labyrinth, minority groups including females, and those whose ethnicity and sexual orientation differ from the organization as a whole, may experience more barriers in the advancement process (Northouse, 2019). Further research is needed to understand differences in perceptions of prejudice and discrimination. Finally, relationships between other demographic factors including age, time in a current position, and time in a career field and WPDI items should be analyzed. This information could indicate areas for workplace development training and curriculum development.

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The Teaching Techniques of Alabama Agricultural Science Educators

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The Teaching Techniques of Alabama Agricultural Science Educators

Introduction

For School-Based Agricultural Education (SBAE) instructors, the teaching techniques used are vital in the planning and implementation of classroom instruction. These techniques are how instructors deliver content and facilitate student learning (Newcomb et al., 2003; Phipps et al., 2007; Talbert et al., 2014). Even with the various levels of professional development on teaching techniques, SBAE educators still gravitate towards the use of lecture and lecture-based techniques mainly (Boyle, 2011; Smith et al., 2015). Thus, the purpose of this study is to determine teaching method instruction and the teaching techniques being utilized in the SBAE. The following objectives guide this study:

1) Identify common teaching techniques traditionally taught to pre-service agricultural science educators
2) Determine commonly used teaching techniques in Alabama school-based agricultural education

Theoretical Framework

This study is guided by the Self-Efficacy (SE) theory. Research conducted in the field of agricultural education frequently uses Bandura's (1977) social cognitive theory as a framework, but more specifically, Bandura's SE theory is utilized often to help explain the underlying motivations and perceptions of teachers (Roberts et al., 2006; Stripling et al., 2008; Blackburn et al., 2017). McKim and Velez (2016) conducted a multi-journal review of agricultural education studies that used SE as their theoretical framework from the years 1997 to 2013, and of the 30 studies they located, they found that most of the research investigated teacher retention. However, their study also indicated that at that time there was not as much research exploring outcomes of teacher SE, such as instructional success, which this study aims to identify. However, because of our own review of the literature, we recognize that there is considerable academic conversation on the difference between teacher efficacy and teachers' beliefs about their SE. As a result, we chose to base our framework within teachers' beliefs about their SE since our study looks specifically at the confidence levels and self-perceived competency of teachers.

Dellinger et al. (2008) describe teacher SE beliefs as a "teacher's individual belief in their capabilities to perform specific teaching tasks at a specified level of quality in a specified situation" (p. 752). In other words, SE beliefs speak to a teacher's perception of what counts as an accomplishment in their classroom, which is typically tied to student learning and success. When applied to the agricultural teacher's classroom, it is possible that teachers will become intimidated by instructional situations, especially when they do not feel that they are confident enough to handle it.

Methods

To establish the instrumentation for this study, an in-depth review of commonly used texts and articles used in Methodology of Teaching courses was conducted (Eggen & Kauchak,

2020; Kolb, 1984; Newcomb et al., 2003; Phipps et al., 2007; Plass et al., 2015; Talbert et al., 2013). Utilizing these texts, we identified 20 teaching techniques and a commonly held naming convention for each method was developed through the different established definitions. This naming convention was reviewed by two faculty who regularly teach the pre-service teachers in Alabama for face validity. It was also determined that the terms "Teaching Methods" and "Teaching Techniques" are used interchangeably through these texts. Therefore, this study uses the term "Teaching Techniques" when actively referring to these forms of teaching. To determine the different techniques that Alabama educators employ in their classrooms; an instrument was built asking participants about the different teaching techniques: Which techniques they were taught in teacher preparation; which techniques they utilize in instruction; and their competence to use each technique. Additional characteristic data was also captured within this study. There were 30 participants selected at the 2022 Alabama Agricultural Science Teacher Conference, with 28 fully completing the instrument.

Results/Findings

When looking at which techniques had been taught to the participants, Direct Instruction, Discussion, Experiential Learning, and Lecture Discussion were taught most as each had 16 (57.14%) responses. Of the remaining 16, Role Playing ($n = 5$, 17.86%), Field Trip ($n = 7$, 25.00%), and Simulation ($n = 7$, 25.00%) were the least taught techniques. Participants indicated they are most utilize Demonstration Techniques in their own course instruction with 27 (96.43%) responses. Direct Instruction and Discussions ($n = 26$, 92.86%) followed closely behind. Case Studies ($n = 11$, 39.29%), Role Playing ($n = 13$, 46.43%), and Supervised Studies ($n = 14$, 50.00%) were the least utilized by the participants. Participants perceived competence for each of the techniques showed Average to Above Average competence in Direct Instruction ($M = 3.89$, $SD = .77$), Demonstration ($M = 3.79$, $SD = .92$), and Field Trip ($M = 3.79$, $SD = .92$) techniques. The participants did however indicate Below Average competence in Case Study ($M = 2.82$, $SD = 1.16$), Role Playing ($M = 2.82$, $SD = .98$), and Supervised Studies ($M = 2.82$, $SD = 1.10$) techniques.

Conclusions

Reviewing the data shows that the previously taught techniques were utilized by participants more often in their course and instruction and had higher perceived competence than those that they had not received training on. Looking back at Bandura's (1977) SE theory, it appears that an educator's use of a technique and their perceived competency is connected to their previous knowledge of said technique. There was a large increase in utilization of techniques compared to the rate they were taught as course instruction requires the use of differing techniques in and outside the classroom. This also likely connected to the higher competency averages while also lending to the distribution as indicated with the SE Theory.

Implications/Recommendations/Impact

This study shows that educators should be aware of the different techniques they could use in their course instruction. Teacher education should provide, at minimum, an overview and explanation of all the common techniques used in the classroom and laboratory. Future studies should focus on different instructional designs of teacher preparation courses to best provide the wide range of teaching techniques to use within agricultural education.

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Training the Trainers: Effects of STEM-Based Professional Development Training for SBAE Professionals in Louisiana

Introduction/Need for Research

Increased integration of STEM content in agriculture is a critical concern for the agricultural industry as well as agricultural education programs. Despite studies indicating the importance of STEM integration in agricultural education contexts (Parr et al., 2006), many agriculture teachers are not confident in integrating STEM content or activity-based STEM instruction as part of their regular teaching practice (Smith et al., 2015). The labor market in the 21st century has shifted to favor job seekers that are literate in science, math, and technology integration in traditionally single-discipline professions (Bunshaft et al., 2015). Further, the need to emphasize scientific concepts underlying agricultural processes grows more imperative as environmental issues intersect with agricultural interests in the form of climate change, coastal loss, saltwater inundation, and eutrophication (Dooley & Roberts, 2020).

For Louisiana, addressing changes in the demands placed on agricultural educators to prepare agriculturally and environmentally literate citizens through school-based agricultural education (SBAE) must be addressed. Louisiana has lacked comprehensive STEM standards within their SBAE curriculum, resulting in a lack of STEM integration. To first address the need for STEM integration in school-based agricultural education (SBAE), a new industry-based credential, called Agritechnology (Agritech) was introduced to Louisiana in 2017. However, SBAE professionals lacked a sufficiently robust companion curriculum and access to laboratory activities. To address the needs of agricultural educators following the introduction of this credential and supplement the existing learning standards, a USDA-NIFA grant was secured that (1) developed a STEM-forward curriculum and laboratory guide aimed to help students attain the Agritech credential, (2) created an Agritech Ambassador training program which would train a select group of SBAE teachers in STEM content and, 3) would provide materials and resources for those Agritech Ambassadors to facilitate trainings across Louisiana.

Theoretical Framework

This study was framed based on Donald Kirkpatrick's evaluation framework. Kirkpatrick's evaluation framework focuses on four levels of training outcomes: 1) participants' level of satisfaction with the training program; 2) changes in participants' knowledge, skills, and aspirations; 3) changes in participants' professional behavior and practices; and 4) organizational impacts of participants' practice changes (Kirkpatrick & Kirkpatrick, 2006) This project focused on the first three levels of outcomes specified within the evaluation framework.

Methodology

This evaluation study analyzed the effects of an intensive three-day STEM integration training program on a group of teachers (N = 8) selected to serve as Agritech Ambassadors for a STEM integration training program in Louisiana. From a population of over 250 agricultural educators in Louisiana, eight were selected via an application process. Applicants were selected primarily to ensure regional representation, but attributes such as gender, length of career, and age were

also considered. After selection, teachers participated in an intensive three-day training program which included STEM content as well as hands-on laboratories. Pre- and post-evaluation survey tools were utilized to measure Agritech Ambassador satisfaction following this initial training. Three outcomes were measured through paired surveys. The first outcome, participant satisfaction, was assessed using a post-training assessment consisting of 12 items with a five-point Likert scale ranging from 1 = *Not Satisfied* to 5 = *Very Satisfied*. The Cronbach's reliability alpha of this 12-item satisfaction scale was 0.87. The second outcome, a skill development assessment distributed both pre- and post-training, used an eight-item, five-point Likert scale ranging from 1 = *Not Confident* to 5 = *Very Confident* to determine participants overall confidence in implementing STEM content and laboratory activities within training programs as well as within their own classrooms. The Cronbach's reliability alpha of this 12-item satisfaction scale was 0.84. Lastly, Agritech Ambassadors were surveyed regarding their intentions to implement practices demonstrated in the training program in their own classrooms using a four-point Likert scale ranging from *No Intention to Implement* to *Already in Use.* Data collected were analyzed using the IBM-SPSS 26 program. Descriptive statistics were used to summarize data, while paired sample t-tests were used to compare Agritech Ambassador pre and post training outcomes.

Results/Findings

Quantitative data analysis reveals that participants' years of experience as an agriculture teacher ranged from 2 years to 25 years with a mean of 12.8 (SD = 8.2). The number of unduplicated students in training participants' SBAE programs ranged from 53 to 350 students with a mean of 147 students (SD = 92). Participants who have multi-teacher programs indicated their total number of students ranged from 108 to 530 students with a mean of 226 students (SD = 79). These teachers described their potential to impact 1322 students directly in their SBAE programs. Qualitative data analysis was collected through participants' responses to open-ended questions at the post- test further highlighted the outcomes of the Agritech ambassador-training program. These findings support that the training program was effective in preparing the Agritechnology Ambassadors to apply various hands-on experimental learning opportunities to teachers across the state as well as within their own SBAE programs.

Implications/Recommendations/Impact

Based on the results of this study, intensive professional development training provided a measurable increase in teacher perceptions and intention to increase STEM laboratory integration in their programs. This program utilized directed training not only in STEM theory, but also in laboratory application. This model provides a baseline for helping teachers better understand STEM content while also utilizing active experimentation. Participants indicated they were Satisfied (38%) or Very Satisfied (63%) with the training program and their knowledge of the subjects addressed in the training increased across all participants. Similarly, participants' confidence and overall skill increase as a result of this training program. This study recommends follow-up research be conducted to determine if intent to integrate STEM content increased the practice of STEM integration and that this model of training be replicated with larger groups to determine success within and outside of Louisiana.

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"Walkin' on Eggshells": Black Doctoral Women and Gendered Racial Microaggressions in Agricultural and Life Science Disciplines

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"Walkin on Eggshells": Black Doctoral Women and Gendered Racial Microaggressions in Agricultural and Life Science Disciplines

Introduction/Need for Research

Black women have been and continue to be severely underrepresented in graduate programs. Black women have experienced decades of socio-historical challenges that have impeded their success in graduate programs, such as isolation and exclusion from white peers. The overrepresentation of whiteness, along with the underrepresentation of Blackness, reinforces the norm that Black women do not belong (Anderson, 2015). As a result, Black women have reported the lack of Black women graduate students and Black women faculty as a deterrent from enrolling in a graduate program (Croom & Patton, 2011), continuing in a graduate program, or pursuing a career in academia. There is a gap in the literature that seeks to understand how and why Black women are so severely underrepresented in AgLS education at all levels.

Gendered Racial Microaggressions

Gendered racial microaggressions have been used to other and subordinate Black women in society; and therefore, higher education. They manifest in four major themes: 1) assumptions of beauty and sexual objectification, 2) silenced and marginalized, 3) strong Black woman stereotype, and 4) angry Black woman stereotype (Lewis & Neville, 2015). Lewis et al.'s (2013) focus group study revealed Black women in higher education are at risk of experiencing gendered racial microaggressions in their social and collegiate relationships, the academic environment, and in the classroom. Gendered racial microaggressions have been linked to increased psychological distress, increased depressive symptoms, and lowered self-esteem (Szymanski & Lewis, 2016), and cause difficulty in forging relationships with faculty, staff, and potential mentors.

Purpose of the Study

This study is from a larger narrative study which examined how intersecting oppressed identities shape the experiences of Black doctoral women doctoral candidates in Agricultural and Life Science disciplines at Historically White Institutions (HWIs) and how those experiences shape their journey into or away from the academy (Author, 2020). The current study will focus specifically on the participants' experiences with gendered racial microaggressions. The research questions that guided this study were:

1. What were Black doctoral women's experiences of gendered racial microaggressions in agricultural sciences at an HWI?
2. What coping strategies did they use to deal with gendered racial microaggressions?

Theoretical Framework

The theoretical framework for this study was Intersectionality. Intersectionality occurs when two or more oppressed identities interact to influence the experiences of Black women in society (Crenshaw, 1989; 1991). Crenshaw (1989) argued that any analysis lacking intersectionality cannot sufficiently address the lived experiences of Black women. Employing intersectionality as a lens to examine the interaction of race and gender is critical to understanding power and privilege, and their influence on experiences of minoritized individuals in different contexts (Nuñez, 2014).

Methodology

Critical narrative inquiry was deemed most appropriate for this study. Critical narrative inquiry questions how narratives intersect with power, and their positionality (Allen & Hardin, 2001). Following IRB approval, participants were recruited from four 1862 land-grant universities. Potential participants were identified using key informants and snowball sampling. Six participants took part in the study, including the author. Data was collected via zoom interviews with three rounds of interviews. Participants also completed a demographic questionnaire and a personal narrative, where they answered two open-ended questions about their doctoral journey. Interview audio, interview notes, and observations were transcribed and checked for accuracy.

Analysis

I conducted two cycles of coding. Initial, simultaneous, and narrative coding were used during the first cycle. During initial coding, I read interview transcripts line by line for familiarity with the data. Simultaneous coding allowed me to assign multiple codes to content that may have more than one meaning (Saldaña, 2013). Narrative coding allowed me to explore intra- and interpersonal participant experiences and actions to better understand their lived experiences. During the second cycle of coding, I used focused coding to organize the data around the most salient categories (Saldaña, 2013), then used those categories and codes to develop themes for a written narrative about the participants.

Preliminary Findings

Following data analysis, I identified three ways gendered racial microaggressions manifest for my participants: Assumptions of Communication Style and Beauty, Angry Black Woman, and Silenced and Marginalized. These stereotypes were projected upon my participants, gendered racial microaggressions occurred, and subsequently, my participants were silenced and marginalized. Avoiding speaking up for oneself contributes to the vicious cycle of microaggressive behavior. The perpetrator has the privilege of either not being aware or not caring they committed a microaggression, and the victim is put in a position of rocking the boat by speaking up, which leaves room for the perpetrator to offend again.

Conclusions/Implications

The findings from this study can be used to reassess departmental and faculty practices regarding appropriate and prohibited interactions with Black women doctoral students that shape their doctoral experiences. By naming how white supremacy, racism, and sexism converge with practice, institutional agents can generate solutions to contribute to Black women's success not only in AgLS, but also in their general graduate school experience. Further, this study may contribute to practice by providing recommendations that can challenge and hopefully lead to changes in institutional practices and norms that negatively influence Black women's experiences and persistence in doctoral education.

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We Speak for the Corn: An Analysis of organizational use of the "corn kid" meme

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We Speak for the Corn: An Analysis of organizational use of the "corn kid" meme

Introduction

Richard Dawkins is credited with coining the term "meme" (Guadagno et al., 2013). In this original definition, a meme was described as "individual bits of cultural information that propagate from person to person while undergoing variation, selection, and retention" (Guadagno et al., 2013). Baker and Gammon (2008) assert that memes move through society via social learning channels and, "at any given time, members of a population either are adopting cultural traits, which become memes, or rejecting those traits through a complex interplay of social, emotional, and cognitive processes." Internet memes are essentially a digital version of Dawkins's 1976 idea (Baker & Gammon, 2008). When embedded within an existing network of like-minded individuals (e.g., online political organizations), this contagion can spur appropriate behavioral responses by a mass of people (Guadagno et al., 2013), a.k.a. "going viral." Such memes may present an opportunity for businesses and organizations to integrate pop culture into their social media posts and stay relevant or to use viral memes to grow their social media engagement.

TikTok has spurred a large growth in viral memes and videos. The latest of these viral TikTok memes is the Corn Kid meme, which debuted on August 18, 2022. During an interview, a young boy expresses his love for corn. A recording of that interview was remixed into a catchy song and published as a "sound" on TikTok. This sound "blew up" on TikTok and has since had 1.3 million videos made from the original sound. This project explored the use of the viral corn kid meme by corn growers' organizations and its effect on their Facebook engagement rates.

This research supports Research Priority 1 of the American Association for Agricultural Education which is focused on public and policy maker understanding of agriculture and natural resources. With engagement critical to online learning (Martin & Bolliger, 2018), it is important to understand how agricultural groups capitalize on spontaneous public engagement with an agricultural topic.

Conceptual Framework

The research was guided by Mills (2012) the SPIN Framework, specifically his integration. stage. This stage occurs when marketers launch campaigns in offline or 'traditional' media as well as online (Mills, 2012). Most straightforward integration occurs between several online social media platforms (Mills, 2012). Truly explosive growth in viral exposure requires a catalyst that can be provided by mainstream and therefore widespread exposure (Mills, 2012).

Methodology

This study consisted of a quantitative content analysis of Facebook posts made by state and national corn checkoff organizations. The researchers identified 25 corn-related organizations with aid from a United States Department of Agriculture's website. They then sought out the Facebook accounts of each organization. The following organizations did not have Facebook pages: Alabama Soybean and Corn Association, Arkansas Corn and Grain Sorghum Board, and Mississippi Corn Promotion Board.

The researchers randomly divided the remaining list of organizations into equal sections. For each organization, the researchers recorded the engagement on all posts from July 15 to September 15, 2022. Data collected included both likes and shares on each of the posts. As data was limited to quantitative, descriptive data, no coding agreement was necessary. Data collection

occurred over two weeks in October 2022. In total, 570 posts were recorded. Team members worked from a shared Microsoft Excel document. All statistical analysis was completed within Excel.

Results

The mean number of posts per state was 23.79. Researchers found that across all the analyzed posts, the mean number of likes was 18.75, and the mean number of shares was 2.78. The total number of references to the corn meme was 11.

Prior to August 18, 2022, the mean number of likes was 15.04 ($SD = 55.42$). Starting on August 18 and tracking forward, the mean number of likes was 24.05 ($SD = 135.48$). The mean number of shares prior to August 18, 2022 was 2.97 ($SD = 12.92$). The mean number of shares after August 18, 2022 was 2.52 ($SD = 9.68$). In order to determine if any statistical difference existed between those numbers representing the time before the corn meme's emergence and those that occurred after, two independent sample's t-tests were run within the Excel with results displayed in Table 1. No significant difference was indicated for either likes ($p = .34$) or shares ($p = .63$).

Table 1.

Independent Samples T-Test for Post Likes ($n = 570$)

Engagement	August 17 & Prior		August 18 and After		$t(568)$	p
	M	*SD*	*M*	*SD*		
Likes	15.04	55.42	24.04	135.48	-0.95	.34
Shares	2.97	12.92	2.52	9.68	0.48	.63

$*p < .05$

Discussion

There was no significant difference in corn growers' association Facebook engagement before and after the corn meme. The average number of likes and shares was low with the exceptions of a few outliers unrelated to the meme in question, implying a low amount of engagement across corn growers' associations nationwide. While there appeared to be a slight increase in the mean amount of likes after the corn meme was at its peak, statistical analysis showed no significant difference between these groups.

Of note, only 11 posts could be identified as relating to the "corn kid" meme. This suggests that corn growers' organizations did not take advantage of the corn meme while it was at its height of popularity. This may have been a missed opportunity to capitalize from the meme within Facebook.

For practice, the research team recommends commodity organizations continue close monitoring of social media channels for viral memes and trends on the internet, and work to integrate these into a social media mix when/if they emerge.

Future research could use qualitative methods to engage with social media managers at corn associations to be better understand what pressures and decisions their engagement or lack thereof with this meme.

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Who Will Hear Me? The Study of a Migrant Worker Turned Agricultural Teacher

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Who Will Hear Me? The Study of a Migrant Worker Turned Agricultural Teacher

Introduction/Need for Research

With just over 275,000 seasonal work permits approved in 2022 (United States Department of Agriculture (USDA), n.d.) there are many families that are brought to the United States to work seasonally within the agricultural industry. These jobs vary depending on the geographic location and need of the industry at the time of arrival. With the arrival of these families comes their children who are enrolled into public education during the duration of their stay (Free et al., 2015). These children bring with them a wealth of knowledge and experience that can diversify and uplift the current agricultural education classroom throughout our public education system (Barajas et al., 2020). Thus, emerges a need for culturally inclusive agriculture education classrooms that build environments that are inviting and inclusive for migrant youth (Barajas et al., 2020). The researchers for this study wanted to better understand the lived experiences of migrant youth within the public education system and their interactions with agricultural education during their secondary education experience.

This study worked with an individual who came to this country on a migrant visa with his family. Through the lens of both the individual and his wife this narrative based qualitative study looks at this couples' lived experiences. The male participant completed his secondary educational experience while working on a strawberry farm and decided to become a secondary agricultural teacher. This study aims to learn what impacted this student's decision to become an agricultural teacher and how they leveraged their cultural wealth and experiences to meet the challenges experienced in the public education system.

Conceptual Framework

This study was grounded in the anti-deficit framework for achievement (Harper, 2010). This framework challenges the traditional beliefs that diverse students within the classroom are at a disadvantage due to their biological, social, or inferred differences. This is especially true when considering English language learners (ELL's). This framework works to identify the cultural strengths and resources that an individual has access to and has leveraged within K-12 education. This framework was developed to combat the mindset that African American youth come to the education environment inherently disadvantaged due to their racial origins. Although this framework was primarily designed for African American male's research supports its application to the Latinx community (Harper, 2014; Perez, 2017).

Methodology

The participants of this study were selected from a cohort of preservice agricultural teachers. Selection criteria were determined due to the unique experiences and insights the participants had in addressing the purpose of the study. A personal interview was conducted in a narrative fashion with the pre-service agricultural teacher and their spouse. After the participants shared their story, the researcher followed with several questions guided by the anti-deficit achievement framework. Data was analyzed using qualitative coding methods such as developing codes in line with the anti-deficit achievement framework. All codes were grouped,

and general themes emerged from the research (Saldana, 2016). Due to the number of participants and nature of this study results and findings are constricted to the specific lived experiences of the participants and are not generalizable to the Latinx demographic as a whole. Trustworthiness for this study was established through member checking, peer debriefing, field notes, and reflexive journaling.

Results/Findings

After careful review of initial data several themes began to emerge. The first theme to emerge was that lived experience within agriculture created a desire to give back through education. For example, participants mentioned that as they are in classroom, the participant felt empowered by their knowledge of agriculture and confident in their ability to leverage their students' access to agriculture for the benefit of all students in their classroom. The general agricultural classroom culture served as a deterrent for participating within the program. The participant mentioned how the demographic of their agriculture program was dissimilar to them and they felt that it was an insurmountable difference. Agriculture teachers are the key to Latinx youth participation within the program. Although participants were not a part of their secondary agricultural education program, they felt that had the teacher made an effort to communicate or prioritize their needs it would have been easier to join the program. Perceived lack of resources prevented youth participation. The participant mentioned how although agricultural education program events were advertised, he never felt like he could participate due to lack of transportation to and from the event especially if it occurred before or after school. Lastly, familial and cultural assets were leveraged in response to barriers, specifically faith and a hard-working work ethic.

Conclusions

Findings from this study are restricted specifically to the two individuals who participated. Though these experiences cannot be generalized they do serve as a foundation for additional research when looking at the lived experiences of migrant workers and their unique journeys in becoming agricultural teachers. The findings highlight the role of the agricultural teachers in both creating an inclusive culture and being the bridge that allows for the Latinx population to participate in agricultural education as supported by the findings of Barajas et al. (2020). Having Latinx teachers within the agricultural classroom could help to build a conducive culture that attracts Latinx youth due to their exposure and understanding of the Latinx culture.

Implications/Recommendations/Impact on Profession

As the agricultural profession continues to grow and as we continue to face a shortage of agricultural teachers (Eck & Edwards, 2019), finding individuals with hands on experience and a passion for the industry could be found within the migrant communities and should be explored for recruitment and retention of agricultural teachers. While this study was conducted with only two participants it is recommended to expand this qualitative study to include greater numbers of migrant workers preferably throughout the country to see if the needs and experiences vary and to add reliability to the findings of this study. As a profession creating culturally inclusive programs allows for organic recruitment and retention of diverse agricultural educators.

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