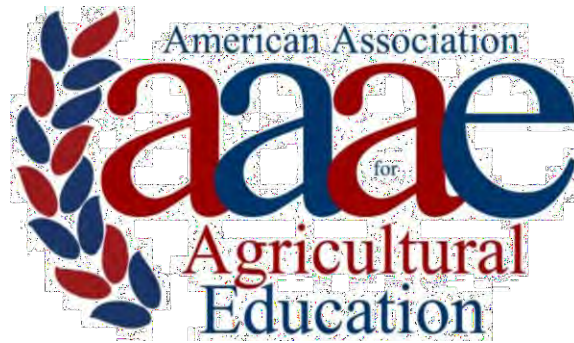


**SOUTHERN REGION CONFERENCE  
OF THE**



**2022 PROGRAM**



**February 13 – February 15, 2022 – New Orleans, Louisiana**

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## **Agenda for Southern Region -AAAE**

### **Saturday, February 12, 2022**

4:00-6:00      Registration      Napoleon Foyer

### **Sunday, February 13, 2022**

8:00-10:00      Registration      Napoleon Foyer

Breakfast on your own

9:00-10:00      Ag Ed Opening Session      Nottoway

10:15-11:45      Research Session I

#### **Napoleon B2 – Session A**

- The Intersection of Gender, Media, and Policy: An Analysis on Thai Newspaper Coverage of Women in Agriculture, Dr. Morgan A. Richardson Gilley, Dr. Richie Roberts, Dr. Kristin S. Stair, Dr. J. Joey Blackburn
- Troubling the Discourse on Global Agricultural Extension: A Feminist Critique of Gender Inequalities in Southeast Asia and Sub-Saharan Africa, Dr. Morgan A. Richardson Gilley, Dr. Richie Roberts, Dr. J. Joey Blackburn, Dr. Kristin S. Stair
- From Privilege to Advocacy: The Cultural Growth Experienced by Secondary Agricultural Education Teachers During an International Experience to Costa Rica, Abigail Greer, Nicholas P. Uzee, Korie A. Burgess, Dr. Richie Roberts, Dr. Kristin Stair, Dr. Joey Blackburn
- The One-Way (Agri)Cultural Mirror: A Case Study of How Young Agricultural Leaders Understand and Experience Culture, Janiece M. Pigg, Dr. Kristin S. Stair, Dr. Richie Roberts, Dr. Joey Blackburn

#### **Oak Alley – Session B**

- Selected Factors Influencing College of Agriculture Student Retention, Tyler Granberry, J. Joey Blackburn, H. Eric Smith, Kristin S. Stair, Richie Roberts
- Relationships among Achievement Goal Orientation and Self-Efficacy in College of Agriculture Courses, Christopher M. Estepp, Addison Beckham, Alyssa J. Rohr, Henry O. Akwah, Donald M. Johnson
- A Ten-Year View of Georgia Agriculture Teacher Attrition and Mobility, Dr. Jason Peake, Dr. Eric Rubenstein, Dalton Green
- Critical Issues Facing Georgians: An Application of the Delphi Technique and Community Capitals Framework, Alyssa Powell, Dr. Kevan W. Lamm

#### **Napoleon B1 – Session C**

- Qualitative Analysis of South Carolina 4-H Programming during COVID-19 Pandemic, Lauren B. Hood, Christopher J. Eck, K. Dale Layfield, Joseph L. Donaldson
- To Stay or Leave: Job Embeddedness among Cooperative Extension Agents, Megan Wells, Anika Parks, Jefferson D. Miller, Donna Graham, Casandra Cox

- Defining Work-Life Balance of Work-Linked Spouses in Agricultural and Extension Education: A Pilot Study in Qualitative Content Analysis, Dr. Travis Park, Alyssa Spence
- Storying Outdoor Youth Education: A Historical Narrative of the [State] 4-H Camping Movement, Adam M. O'Malley, Dr. Richie Roberts

12:00-1:30      Lunch on Your Own

1:30-3:00      Research Session II

### **Edgewood A/B – Session D**

- First Steps Toward Developing the Multicultural Autonomous Agricultural Educator, Stacy K. Vincent
- Examining Ethnic Identity of Undergraduate Agriculture Majors, Steven Boot Chumbley, Leslie Dominguez, Tyson Sorensen
- The Effect of Two Reflective Strategies on Student Multicultural Competency Development during an Online Multicultural Course, Dr. Lauren Lewis Cline, Dr. Penny Pennington Weeks, Dr. William G. Weeks, Dr. J. Shane Robinson, Dr. Karen Hickman
- The Relationship of Teacher Expectancy and Secondary Student Performances in Single Sex and Coeducational Classrooms, Stacy K. Vincent & Brett M. Wasden

### **Estherwood – Session E**

- Personal and Contextual Factors Predicting Agriscience Teaching Self-Efficacy, Dr. Millicent A. Oyugi, Dr. Amy Boren-Alpizar, Dr. David Lawver, Dr. Rudy Ritz, Kamau O. Siwatu, Dr. Alexa J. Lamm
- Defining Programmatic Balance: A Modified Delphi Study, Dr. Keith J. Frost, Dr. John Rayfield, Dr. Maggie R.P. Salem, Dr. Will Doss
- ESL and ELL Challenges Presented by Early Career Teachers in a Phenomenological Investigation, Dr. Maggie R.P. Salem, Dr. Keith J. Frost, Dr. Will Doss
- Investigating the Impacts of a Preservice Agriculture Teacher Recruitment Program using Kirkpatrick's Program Evaluation Model, Hur, G., Barry, D. M., Jagger, C. B., Alford, K. R., Roberts, T. G.

### **Napoleon C3 – Session F (Emerging research)**

- The State of Agricultural Mechanics in the Preparation of School-based Agricultural Educators – Tyler Granberry
- Forecasting the Future Trends of Agricultural Mechanics Education: A Q Methodology Study – Tyler Granberry
- School-Based Welding Course Learning and Self-Determination Support Interventions for Students with Developmental Disabilities - Maureen Victoria
- Determining the professional development needs of students using augmented reality welding systems – Brad Borges
- Student Perspectives in Agricultural Leadership Education: A Q Methodology Study - Caitlin Dreher

### **Napoleon B3 – Session G (Emerging research)**

- Effects of Message Framing and Source of Information About an Alternative Meat Curing System on Information Recall, Trust, and Anticipated Purchase Behavior, Matt Baker
- Best Practices for Mentoring: Cooperating Teacher & Student Teacher Perspectives, Deb Barry
- Examining High School Senior FFA Members College and Career Readiness, James Scott
- Pronoun Preparedness of Preservice School-Based Agricultural Education Teachers: Analysis of Their Knowledge and Preparedness Regarding Gender Pronouns, Tyler Price

2:45-4:00      Innovative Poster Session      Napoleon Foyer

4:00            SAAS General Business Meeting

5:00            Super Bowl Party - Sheraton

### **Monday, February 14, 2022**

8:00-10:00    Registration      Napoleon Foyer

7:30-9:00     Grad Student Breakfast      Napoleon C3

9:00-10:30    Research Session III

### **Napoleon B1 – Session H**

- Purposeful STEM Integration in School-Based Agricultural Education Programs, Christopher J. Eck, Kristopher Rankin III, and J. Shane Robinson
- Effects of an Instructional Treatment on the Interest, Self-Efficacy, and Knowledge of Novice Arduino Users, G. T. Hood, D. M. Johnson, M. L. Pate, C. M. Estepp, & G. W. Wardlow
- Internal Vs External Locus of Control's Effect On Learning Type In Agricultural Mechanics, Jason D. McKibben, Kelly Holler, Christopher A Clemons, James R Lindner
- School-Based Agricultural Education Teachers' Current Level of STEM Integration, Christopher J. Eck and Nathan Smith

### **Napoleon B2 – Session I**

- Was #EndSpeciesism a Fumble? An Investigation of the Public's Perceptions of PETA's Message Framing Strategy During Super Bowl LIV, Rexanna Powers, Dr. Richie Roberts, Dr. Taylor K. Ruth
- A Historical Examination of Food Labeling Policies and Practices in the United States: Implications for Agricultural Communications, Rexanna Powers, Dr. Richie Roberts
- Predicting Agricultural Sciences Students' Media Literacy in a Post-Truth Era, Abigail Durham, Kasey Harmon, Dr. Taylor Ruth, Dr. Nathan Conner, & Dr. Cara Lawson
- Perception of Alabama and Georgia Local CTE Administration on Integration of Employability Skills into Agricultural Education, Dr. John William Norris, Dr. Kirk A. Swartzel

### **Oak Alley – Session J**

- Perceptions of an Agricultural Literacy Professional Development Program for Teachers, Shannon K. Allen, Casey M. Moss, Carley C. Morrison, Stephanie M. Lemley
- Exploring the Culture of the Agriculture Industry, Maegan Meredith
- Female Agriculture Teachers Lived Experiences and Perceived Professional Development Needs when Teaching Students with Special Needs, Ms. Raegan Ramage, Dr. Kristin Stair, Dr. Richie Roberts, Dr. J. Joey Blackburn
- Secondary Agricultural Education Instructors Perceived Importance and Ability when Accommodating Students with Special Needs, Ms. Raegan Ramage, Dr. Kristin Stair, Dr. J. Joey Blackburn, Dr. Richie Roberts

10:45-11:45	AAAE Business Meeting Session	Napoleon B2
Noon-1:30	Luncheon and Distinguished Lecture	Bayside ABC
1:30-3:00	Research Poster Session	Napoleon Foyer
3:15-4:30	Professional Development Panel	Napoleon B2
5:00	Explore the City Tour & Social Activity	Across New Orleans

### **Tuesday, February 15, 2022**

8:00-9:00 AM	Business Session	Napoleon A2/A3
9:15-12:00	<b>Distinguished Manuscript Presentations</b>	Napoleon A2/A3

- The Effects of Single-Sex Classrooms Compared to Coeducational Classrooms On Secondary Student Career Interest, Brett M. Wasden, Stacy K. Vincent, Eric M. Moser
- The Effects of Survey Response Mode and Incentives on Response Rates, Dr. Will Doss, Dr. John Rayfield, Dr. David Lawver, Dr. Scott Burris
- Identifying Challenges Faced by School-Based Agricultural Education Teachers, Dr. Will Doss, Dr. John Rayfield, Dr. David Lawver
- Evaluation of Cultural Diversity in Secondary Agricultural Textbooks, Tara E. Rojas & Stacy K. Vincent
- Casting a Critical Lens on Thailand's Higher Education System: A Case Study of Women's Experiences as Agricultural Extension Faculty, Dr. Morgan A. Richardson Gilley, Dr. Richie Roberts, Dr. Kristin S. Stair, Dr. J. Joey Blackburn

Brunch

Award Ceremony

## **The Intersection of Gender, Media, and Policy: An Analysis on Thai Newspaper Coverage of Women in Agriculture**

### **Authors**

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Project Type: Completed

Discipline Area: International Development & Agricultural Communications

### **Introduction and Review of Literature**

Addressing gender inequalities and furthering women's empowerment is crucial to global agricultural development. Previous research has found that reducing gender inequalities can help advance agriculture and rural communities (FAO, 2011; Seymour, 2017; World Bank, 2012). Consequently, gendered issues have become closely intertwined with global development efforts (Seymour, 2017; Yaya et al., 2018). As an illustration, women's empowerment has been repeatedly ranked as a high priority on the United Nation's (UN) policy agenda because of its potential to create transformative outcomes for global development (UN Women, 2018). As a result, the UN adopted its Sustainable Development Goals with an entire priority area dedicated to the empowerment of women (United Nations, 2017). Promoting gender equality in agriculture has also encouraged progress and economic growth in developing nations. For instance, Ansari and Khan (2018) reported statistically significant and positive relationships existed among technical training for women, agricultural development, and national growth in Thailand. Many rural areas in Thailand rely on agriculture as their primary source of income (Agard & Roberts, 2020). Because of this, agriculture and agricultural products continue to be a critical aspect of the country's economy (Win, 2017). It should be noted that women in this region provide a critical contribution to agricultural labor and productivity (Nguyen et al., 2019). As such, the empowerment of women in agriculture has been vital to growth and development.

Nevertheless, determining effective ways to encourage social progress regarding women's issues has persisted as a critical need. One strategy used to raise the public's consciousness about gendered issues in Thailand has been mass media (Dominick, 2010; Oosthuizen, 2012). Mass media can influence the public because it reaches a diverse range of populations as well as the frequent exposure that many individuals have to these sources of information (Hassanzadeh, 2018; Sharda, 2014). Newspapers, in particular, provide coverage of local and community events as well as reporting on global happenings. Despite this, previous research has shown that men and women are still predominantly represented in ways that adhere to traditional gender roles in the newspaper media (Coltrane & Adams, 1997; Davis, 2003; Ganahl et al., 2003; Reichert & Carpenter, 2004; Rouner et al., 2003; Simon & Hoyt, 2013). Depicting men and women in such ways could further perpetuate traditional gender stereotypes and roles in society and influence



government policy. Consequently, a need emerged to examine how gender, media, and policy have intersected in developing nations such as Thailand.

In May 2016, the Thai government introduced a development initiative called Thailand 4.0. This initiative promoted sustainable agricultural, economic, and social development (Puncreobutr, 2017). The intent of Thailand 4.0 was to lead the country into an innovative and technologically advanced future (Puncreobutr, 2017). The policy emerged after several similar initiatives were successfully implemented in other Asian countries. Under the policy, each ministry, i.e., a department of the Thai government, created and implemented procedures to uphold the aims of the initiative. For example, Thailand's Ministry of Agriculture introduced Agriculture 4.0, a policy focused on advancing new technology and smart innovations to the agricultural industry. As a result of the policy, new research and development funding was allocated to advance drones, precision agriculture, and other technological innovations for the industry (Bhandhubanyong & Sirirangsi, 2019). Ultimately, Thailand 4.0 marked a new development phase and increased focus on social issues such as the effects of policy on women in the agricultural industry. Because of the policy's far-reaching implications, Thailand 4.0 served as an appropriate frame to bound our examination of the intersection of gender, media, and policy.

### **Epistemological and Theoretical Perspective**

For this investigation, we used the epistemological position of constructionism to understand and analyze the study's findings (Crotty, 1998). Constructionism involves an individual's view of their reality and their process of making meaning of the world. Therefore, this lens allowed us to examine how external inputs, such as media and news articles, shape how knowledge has been constructed regarding media coverage of women in agriculture. This study also drew upon a critical theory perspective (Denzin & Lincoln, 2008). Critical theory allows researchers to understand how issues of power such as gendered norms and traditions influence culture, economics, and society. Using these lenses allowed us to examine how power might have influenced representations of Thai women in agriculture.

### **Statement of Purpose**

This study's purpose was twofold: (1) determine to what extent Thailand's newspaper coverage focused on topics related to women and the agricultural industry; and (2) describe how women in agriculture have been portrayed in newspaper coverage of Thailand 4.0 from 2016 to 2020.

### **Methodology**

To investigate how women have been portrayed, we used a qualitative content analysis approach (Elo et al., 2014). To accomplish this, we bounded the analysis by *place*, i.e., Thailand, and *time*, i.e., 2016 to April 2020. To ensure quality, we also embedded Lincoln and Guba's (1985) standards for qualitative quality into the design of this investigation. For this study, we used newspaper articles as the primary source of data because they have been advanced as the most often reliable source of media content (Rosenstiel et al., 2011; Ruth & Rumble, 2016). We analyzed newspaper articles from May 2016 to December 2020 using a qualitative content analysis approach. Both English and Thai-language newspapers circulated in Thailand were

included in the study. To accomplish this, we utilized *Nexis Uni*, an online database, to collect relevant English language online and in print newspaper articles. We used the primary search term “agriculture,” with “women OR woman” as the secondary search term. Additional parameters included: location of publication (Thailand), geography by document (Thailand), publication type (newspapers), and date parameters (2016 to 2020). In total, there were 8,105 matches for the primary search term, “agriculture,” and 352 matches that included both “agriculture” and “women OR woman.”

During our review, duplicate and irrelevant articles were not included for further analysis. Regarding Thai language newspapers, we analyzed newspaper articles from two representative Thai newspapers. These included the *Thai Rath* and *Matichon Online*. We translated each page using Google® Page Translation. The primary search term used on each media source’s search engine was “farm,” which was used rather than “agriculture” because of a lack of results. *Thai Rath* yielded 131 agricultural articles, of which 53 depicted women. Meanwhile, *Matichon Online* yielded 55 agricultural-related articles, with 22 representing women. After narrowing the population from a combined 538 (English- and Thai-language newspaper articles using the search terms “agriculture” or “farm”), there were a total of 204 ( $N = 204$ ) articles depicting women in agriculture. After data collection, we analyzed each source using Saldaña’s (2021) coding process. Coding is a “research-generated construct” that helps researchers ascribe meaning to data, which can be later analyzed to determine patterns and categories (Saldaña, 2021, p. 4). The coding strategy employed in this study involved first and second-cycle coding. The first cycle of coding was an *elemental method* called concept coding (Saldaña, 2021). Concept coding has been used for labeling “big picture” ideas, and as a result, it allows the resulting codes to capture the meaning of the overarching topic of each newspaper article (Saldaña, 2021, p. 97). After completing the first round of coding, the initial codes were reviewed and adjusted, where necessary, to reflect better the fluid and cyclical nature of coding (Rogers, 2018). After finalizing the first cycle code list, we employed pattern coding to reduce the first cycle codes into categories (Saldaña, 2021). Finally, we used a thematic coding approach to further deduce the categories and emerge the study’s themes.

## Findings

Through our analysis of the data, four themes emerged. The themes included: (1) economic policy implications for Thailand’s agricultural system; (2) human rights; (3) women entrepreneurship and leadership; and (4) agricultural development.

### Theme 1: Economic Policy Implications for Thailand’s Agricultural System

The first theme depicted the economic issues published on Thailand’s 4.0 policy. Among the articles, the general trend in this theme spoke to the negative economic impacts of the policy at the domestic and international levels. In particular, financial troubles and unemployment issues that impacted women were often featured. Another emergent concept was the role of economic problems that surfaced during the COVID-19 global pandemic. The pandemic was widely discussed as the reason for agricultural-related economic issues in the news regarding women’s economic empowerment (Banchongduang, 2021; Bangkok Post, 2021; Kuentak, 2021).

Finally, of the newspaper articles analyzed, a critical concept was the role of economic empowerment efforts and their impacts on women. These undertakings were operationalized in the newspapers at the macro and micro levels. For example, on a macro-scale, economic empowerment included global women empowerment efforts, the need for greater engagement of women, and international organization events (Jitcharoenkul, 2017). Jitcharoenkul (2017) also called for greater engagement of women in agricultural and environmental services. He explained: “the sections are growing micro, small, and medium enterprises (MSMEs), enabling financial inclusion, supporting small farms, building human capital, greater engagement of women in services and promoting green growth” (Jitcharoenkul, 2017, p. 6). Conversely, domestic coverage primarily featured financial assistance, economic partnerships with corporations, and growth of small and medium enterprises (Pinijparakarn, 2016; The Nation Thailand, 2016; Termariyabuit, 2018). For example, one article discussed empowering women in agriculture through partnerships with large corporations such as Coca-Cola by “boosting the economic performance of 600 Thai female sugarcane growers” (The Nation Thailand, 2016, p. 4). Therefore, the concept of economic empowerment provided critical insight and commentary on economic issues and frequently featured the initiatives, policies, and voices that influenced women’s lived experiences under the Thailand 4.0 initiative.

## **Theme 2: Human Rights**

The second theme, human rights, exposed how gender inequalities and marginalized populations, such as indigenous groups and migrants, were influenced by Thailand 4.0. Accordingly, two subthemes emerged: (1) gender inequalities and (2) indigenous and migrant worker rights. The first subtheme focused on the gender inequalities that emerged because of Thailand 4.0 on the global, national, and local levels. The newspaper media depicted this phenomenon using stories from women who articulated the realities of gender inequalities, barriers to better opportunities, and violence (Sukkumnoed, 2018). Additionally, several feature articles illuminated the importance of women to the agricultural sector and advanced discussion about persistent gender inequalities and the subjugated position of women in the agricultural industry (Giri, 2019; Kuentak, 2021; Pisuthipan 2018). However, it is important to note that multiple articles touted the critical progress made in the country (Chan-o-cha, 2016; Sukphisit, 2016; Wiriyapong, 2018). For example, Akhtar (2017) featured the region’s progress regarding women’s issues despite persistent disparities in gender equality and pay.

Women were also often the subject of articles focused on indigenous and migrant worker rights after the implementation of the Thailand 4.0 initiative. Case in point, reports on this phenomenon focused heavily on the importance of consulting indigenous populations when making agricultural decisions, the lack of migrant worker rights, and the poor attitudes and perceptions directed at female migrant workers (Duangmee, 2016; Meyer & Niratisayakul, 2020). It is critical to note that women were often the focus of these stories because of the importance of indigenous and migrant women to Thailand’s agricultural industry. For example, indigenous and migrant workers often exhibit a high level of local knowledge about the environmental factors that influence the growing conditions of local crops (Duangmee, 2016). Additionally, Duangmee (2016) described how multiple efforts were established, such as creating a rice bank, to improve the lives of indigenous populations. The newspaper press also featured illegal migrant arrests and

deportation (Khmer Times, 2017; Pakkawan, 2019). Despite this, the depiction of indigenous and migrant workers' rights was positive and called for better conditions, especially for females.

### **Theme 3: Women Entrepreneurship and Leadership**

Featuring women as entrepreneurs and leaders in high-level positions was a common theme in newspaper coverage of Thailand 4.0. The coverage ranged from highlighting women farmers and small business owners to depicting them serving in high-level leadership roles. Therefore, the portrayal of women in these roles was distinctly positive. Accordingly, women-owned businesses were often showcased. Articles featured successful women-owned fisheries, organic farms, fruit farms, and floriculture businesses (Thairath Online, 2017a, 2018). Meanwhile, Panyaarvudh (2016) described how women entrepreneurs helped usher in innovative ideas and designs that helped move the agricultural sector into the digital age.

Similarly, women were often depicted as serving in official capacities for the Thailand 4.0 initiative in roles such as program delegates, spokeswomen, and advisers (Matichon Online, 2017, 2018a, 2018b; Thairath Online, 2020d). Many women in newspaper articles on Thailand 4.0 were often considered global leaders. These included foreign dignitaries or Thai women serving in international positions such as the Consul-General of Shanghai (Thairath Online, 2017a, 2017b). A substantial number of newspapers also mentioned women in national or local leadership roles. These included women in key positions that were serving on various agricultural-related committees, departments in the Ministry of Agriculture, and divisions focused on land and farmer development. Women leaders in those positions often served as keynote speakers at agricultural events and development board meetings (Thairath Online, 2017c). Females were also often mentioned as having consulting roles to assist in creating agricultural and nutrition policies. In fact, women were more likely to be featured in newspapers in these leadership roles and positions for the Thailand 4.0 initiative than males.

### **Theme 4: Agricultural Development**

Agricultural and rural development represented a critical theme in the newspaper media analyzed. Two distinct subthemes emerged from the analysis of these topics: (1) agricultural development and (2) agricultural innovations and technology. The first subtheme focused primarily on women's roles in the development of Thailand's agricultural sector. Newspaper articles reported on programs and initiatives designed to provide training and assistance across multiple sectors. These programs included professional development on agricultural practices and techniques, budgeting, fiscal responsibility, multi-cropping, and STEM integration (The Nation Thailand, 2016; Treerutkuarkul, 2017). For example, one program focused on empowering women by teaching them "agricultural and handicraft skill development" (Yongcharoenchai, 2017, para. 7).

Another critical concept that emerged from the analysis of newspaper articles was depictions of women using and developing agricultural innovations technologies. Topics reported included: (1) demonstrations and professional development on smart farming, (2) digital farming initiatives (3) examples of smart farming applications, and (4) women-owned smart farms (Matichon Online, 2019; Thairath Online, 2019, 2020b, 2020c). In addition to depictions of women

engaging in smart farming practices, various articles featured the successes of women innovators, creators, and entrepreneurs in the agricultural sector (Matichon Online, 2018a; Thairath Online, 2020a). Women were also represented as consumers of agricultural innovations and technologies. For example, female telecommunication experts were used by newspapers to demonstrate how women were assisting underserved populations by increasing information sharing approaches that could help address food security, productivity, and profitability (Pornwasin, 2019). As a consequence, the newspaper media appeared to depict women in agriculture as a way to encourage the continued development of Thailand's agricultural industry.

### **Conclusions, Implications, and Recommendations**

This study examined the intersection of gender, media, and policy by examining newspaper coverage of Thailand 4.0 from 2016 to 2020. Through an analysis of the data, we identified four emergent themes: (1) economic policy implications for Thailand's agricultural system, (2) human rights, (3) women entrepreneurship and leadership, and (4) agricultural development. As a result, we conclude that newspaper coverage of women in agriculture was diverse and conflicting on Thailand 4.0 – a finding that does not appear to have been previously reported. In response, we recommend that future research examine how women in agriculture have been portrayed across various media sources.

The first theme illustrated how women often experience negative economic impacts when faced with changes in agricultural policy. We conclude that the newspaper media reported these negative repercussions in response to periods of an economic downturn that surfaced after the COVID-19 global pandemic. Because of their position in a male-dominated society, women were particularly susceptible to changes in economic and agricultural policies as well as economic downturns. Previous research has suggested that women in this region are secondary or unpaid labor (Nguyen et al., 2019). Because of this, newspaper coverage on negative economic impacts for women in the agricultural sector were likely under-portrayed. However, despite the discussion of negative impacts and likelihood of under-portrayal, the newspaper media provided glimpses of progress in the form of financial assistance, partnerships with corporations, and the establishment of new enterprises for women before the pandemic affected the region (Pinijparakarn, 2016; Termariyabuit, 2018). Consequently, we concluded that the global pandemic negatively affected progress made to economically empower Thai women in agriculture – a sentiment that does not seem to have been previously reported. Nevertheless, a more positive perspective regarding the advancement of human rights emerged in the second theme. In particular, this theme described the advancement of global women's empowerment and gender inequality issues and reported on progress to indigenous women and migrant workers. As a result, we concluded that, in some ways, the Thailand 4.0 initiative fostered critical progress for local Thai women and agricultural development in the region (Ansari & Khan, 2018).

The positive depiction of women in agriculture in Thailand's newspapers was further illustrated in the final two themes. Such a representation of women is critical because newspapers have historically been used as a primary source of knowledge in Thai society. As a result, the depiction of women can play a prominent role in influencing societal perceptions and attitudes on gendered issues (Oosthuizen, 2012). These positive portrayals of women will likely lead to women having an increase in positive self-perceptions, especially for women working in the

agricultural sector. To this end, we conclude that newspaper coverage of Thailand 4.0's introduction depicted women positively by portraying them as entrepreneurs, innovators, and leaders in the agricultural industry – a finding that does not appear to have been previously explored. Because previous evidence has stressed the critical role of media on women's empowerment, this finding provided critical implications that could influence, shape, and potentially challenge deeply ingrained gender stereotypes (Simon & Hoyt, 2013; Sharda, 2014). It is essential to note that there were several limitations to this investigation. First, we were limited by a language barrier and relied on Google® Page Translation. Efforts were made to secure a native Thai speaker to assist with translations. However, because the COVID-19 pandemic proved to be an additional barrier, we could not find an individual who could commit to this process because of the additional responsibilities they endured during this period. Consequently, some of the translations could not have been accurate and may have resulted in our misinterpretation. In the future, we recommend that follow-up studies consult Thai national or language speakers to understand better the narrative reported by Thai media.

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## **Troubling the Discourse on Global Agricultural Extension: A Feminist Critique of Gender Inequalities in Southeast Asia and Sub-Saharan Africa**

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### **Introduction and Review of Literature**

Development in the agricultural sector is vital to small-scale farmers and rural inhabitants across the globe, especially in developing nations (Davis et al., 2020; Msuya et al., 2017). For example, previous research has suggested that small-scale farmers in these regions play an essential role in creating food security because their agricultural output constitutes a significant proportion of their nation's food supply (Altieri, 2009; Azadi et al., 2015; Jouzi et al., 2017; Tschardt et al., 2012). Further, nations in Southeast Asia and Sub-Saharan Africa have also demonstrated the importance of agricultural production in driving national and regional economic growth (Azadi et al., 2015; Food and Agriculture Organization (FAO), 2011). However, the roles of gender equality and women empowerment in these spaces have been historically ignored in global agricultural development (Lecoutere et al., 2019; Niewoehner-Green et al., 2019; Richardson & Roberts, 2020). Despite this, some researchers (Malhotra et al., 2002; Sundström et al., 2017) have demonstrated that a lack of gender equality in emergent economies has slowed progress by stifling agricultural development. To demonstrate, previous evidence has shown that a statistically significant and positive relationship existed between the empowerment of women and improved food security for developing nations (Akter et al., 2017; Harper et al., 2013; Sraboni et al., 2014). However, a complex array of intersecting trends has further compounded gender inequalities in these regions, particularly in Southeast Asia and Sub-Saharan Africa.

Case in point, in Southeast Asia and Sub-Saharan Africa, women have been relegated to specific agricultural tasks because of sociocultural perceptions that have shaped views about gender and abilities (Akter et al., 2017; Mogues et al., 2009). In particular, women are often responsible for menial and repetitive tasks such as manual harvesting, post-harvest production, preparing lunches, seeding, transplanting, weeding, and more (Akter et al., 2017). Therefore, finding innovative and sustainable ways to support women in agriculture through education and training is critical to meeting global development goals (FAO, 2011). One approach that has been advanced to address gender-based disparities in these regions is agricultural extension. Extension programming, a form of educational outreach, for women has been shown to promote alternative farming methods, commodity processing, crop production, and the marketing of agricultural products (Charman, 2008; Ugbomeh, 2001). However, the benefits of extension programming have been reported to extend beyond the development of technical agricultural knowledge and

skills. For instance, some evidence (Lecoutere et al., 2019; Ugbomeh, 2001) has suggested that extension programming can improve women's attitudes about adopting new agricultural practices while empowering them to have the agency needed to make critical business decisions.

As a result, Richardson and Roberts (2020) called for extension professionals to reimagine programming in ways that can empower women in agriculture to better traverse male-dominated spaces. To accomplish this, it is critical to understand how gender-based inequalities converge and diverge for extension professionals as they navigate deeply entrenched gender norms at the regional level. Pursuing this notion further, Akter et al. (2017) explained: "If region-specific information on gender gaps and gender needs and constraints remain unknown and unaccounted for, the commonly utilized gender intervention frameworks...will be incompatible..." (p. 271).

### **Theoretical Perspective**

In framing this investigation, we used a feminist theoretical perspective to guide our decision-making (Crotty, 1998). When using this lens, researchers seek to critique gendered forces in hopes of spurring social change to improve the lives of women and other marginalized populations (Bailey, 2016). Instead of traditional forms of inquiry that focus on the creation of knowledge, feminist scholars call for action by critiquing norms and traditions that preserve systems of oppression (Bailey, 2016). We embedded these values to critique the roles that women have assumed in the agricultural systems of Southeast Asia and Sub-Saharan Africa.

### **Statement of Purpose, Rationale, and Research Question**

Although gender inequalities exist in all cultures (Bailey, 2016), Southeast Asia and Sub-Saharan Africa were chosen as the focal points. We chose to compare these regions because the discourse on gender in agriculture has historically depicted this issue as occurring uniformly across developing nations (Tarekegne & Dessie, 2020). Further, Sub-Saharan Africa has primarily been the focal point regarding funding for agricultural development, while other developing regions, such as Southeast Asia, have been largely ignored recently (Yan, 2020). This study aimed to critique how gender inequalities in Southeast Asia and Sub-Saharan Africa have marginalized women in agriculture. One research question guided this inquiry: How are Southeast Asia and Sub-Saharan Africa similar yet unique concerning gender inequalities in the agricultural sector?

### **Methods and Procedures**

We fulfilled the study's purpose by using a feminist critique approach (Ramazanoglu & Holland, 2002). Feminist critiques are a form of philosophical research that allows scholars to analyze prevailing ideas while also *troubling* their underlying assumptions using a gendered lens. As a result, the intent is to uplift the marginalized voices of women by investigating the sociohistorical structures that have impeded their agency. To achieve this, we critiqued existing research and theory on women's issues in agriculture for Southeast Asia and Sub-Saharan Africa. Then, we synthesized the product of this work into a narrative to demonstrate the contextual nature of gender inequalities in global agricultural development. We used three sources of data to fulfill this aim: (a) books, (b) peer-refereed journal articles, and (c) reports from intergovernmental agencies and research centers. It is important to note that this investigation

focused exclusively on 15 developing nations, seven from the region of Southeast Asia and eight from Sub-Saharan Africa. The countries mobilized for analysis from the Southeast Asian region included: Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Vietnam. Meanwhile, Sub-Saharan Africa nations were Ethiopia, Kenya, Mali, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. The decision to include these countries as part of the review and synthesis stems from the availability of peer-refereed research on gender inequalities. For example, during the literature review, the 15 Sub-Saharan African nations had quality empirical data that had been published in academic journals.

After a systematic review of each data source, we synthesized the findings in a textual narrative (Popay et al., 2006). To begin this process, we divided the data into two groups that represented the regions under investigation to facilitate a systematic comparison of the study's findings. Then, we engaged in multiple cycles of open coding to generate a holistic view of the phenomenon (Saldaña, 2021). Thereafter, we employed pattern coding to scrutinize relationships among the open codes to reduce the data into categories (Saldaña, 2021). This allowed us to observe similarities and differences between the two regions and understand how the phenomenon manifested. Consequently, we illuminated Southeast Asia's and Sub-Saharan Africa's gender inequalities while also offering a critique of such using the feminist lens.

### **Philosophical Themes**

Through our analysis of the evidence on gender inequalities in Southeast Asia and Sub-Saharan Africa, we identified three primary issues across the two regions: (1) access to land ownership, (2) power in decision-making, and (3) male control of agricultural extension services.

#### **Southeast Asia**

Although women in some countries in Southeast Asia, such as Thailand, have been reported to be more empowered than other nations in the developing world, gender equalities persist (Richardson & Roberts, 2020). It is critical to understand that women often hold legal rights to land and property in this region. However, this "legal access to resources does not always produce control over their use" (Nguyen et al., 2019, p. 2). In some areas of Southeast Asia, high levels of illiteracy result in women being unaware of their right to control resources and knowledge that they jointly own land with their husbands. In Cambodia, for example, although women have equal access to land, the patriarchal practices entrenched in society result in male land and asset ownership dominance and few opportunities to obtain agency (Nguyen et al., 2019). This trend has also been reported in other nations such as Myanmar and the Philippines (Akter et al., 2017). Although gender inequalities regarding land ownership persist, women in Southeast Asia often report joint or sole decision-making power in agricultural production decisions (Colfer et al., 2015). Further, in Indonesia and the Philippines, women predominantly make household-based decisions and exhibit control over their earnings (Akter et al., 2017). Meanwhile, major spending and credit-based decisions for agricultural production are typically made cooperatively between married couples (Colfer et al., 2015).

Despite these glimpses of agency, Nguyen et al. (2019) argued that women in this region remain undervalued for their economic contributions. As a result, they are forced into rudimentary jobs

in agriculture. Additionally, women in Southeast Asia have fewer opportunities than their male counterparts for upward mobility in their careers (Nguyen et al., 2019). These issues are further compounded by technological advancements in agriculture that primarily target males, which often results in a deficit of knowledge-sharing behaviors (Rola-Rubzen et al., 2020). For example, new equipment for farming has been traditionally designed for the male physique (Kawarazuka et al., 2018; Rola-Rubzen et al., 2020). As a result, innovations in agriculture tend to be heavier and more cumbersome for women (Rola-Rubzen et al., 2020). Because of this, women often lack basic knowledge about emerging technologies (Kawarazuka et al., 2018).

The suppression of women's knowledge through the lack of access to education, professional development, and resources in Southeast Asia has deeply entrenched sociohistorical origins (Richardson & Roberts, 2020). Similarly, agricultural extension services, a form of educational outreach, have also been controlled by men (Mason & Smith, 2003). This form of gender inequality further marginalizes women in agriculture. To demonstrate, Akter et al. (2017) explained that women in Myanmar and Indonesia perceived a lack of access to extension services, despite having more direct contact with agents than men. Nevertheless, women in the Philippines have been reported to participate more consistently in agricultural-focused meetings than their male counterparts. Akter et al. (2017) also suggested that men may be more likely to listen and discuss the agricultural-related knowledge conveyed by their wives. Consequently, development efforts in this region should examine whether upholding masculine hegemonic structures as the *status quo* could be stifling progress for agriculture.

### **Sub-Saharan Africa**

The gender equalities experienced by women in Sub-Saharan Africa have been documented more thoroughly than in other developing regions (Brown et al., 2017; Manfre et al., 2013; Wekesah et al., 2019). However, concerning trends endure (Roberts & Edwards, 2017). For instance, throughout the region, most women lack equal rights to own land and property (Bosch et al., 2014). Further, in Sub-Saharan Africa, nearly 70% of women claimed they cultivated their husband's land (Bosch et al., 2014). Additionally, women's essential duties and responsibilities in agriculture have been primarily controlled by males in their families (Davis, 2008; Ogunlela & Mukhtar, 2009). For instance, Mudukuti and Miller (2002) reported that women in Zimbabwe identified "permission by husband" and a "lack of access to credit" as two of their major barriers to their advancement in agriculture (p. 296). Meanwhile, some studies have shown that men regularly overrule decisions made by their wives when adopting agricultural innovations (Brown et al., 2017; Wekesah et al., 2019). In fact, Ogunlela and Mukhtar (2009) suggested that women only made from 1% to 2.5% of the agricultural-based decision in Sub-Saharan Africa.

Other issues concerning the roles women assume in agriculture inhibit progress in the region. For example, women in Sub-Saharan Africa are often not recognized for the labor they provide. When describing this phenomenon, Berkelaar (2017) explained that this gendered norm resulted in the "invisibility of women's works" (p. 5). As a consequence, women continue to be viewed as secondary farm labor rather than intellectuals with knowledge and agency to make informed decisions (Paris & Chi, 2005). Another patriarchal force that complicates agricultural development in Sub-Saharan Africa is the role of cultural taboos and norms that stifle women's access to extension services. To illustrate, in many areas of the region, it is still believed that the

head of household, which is often a male, is the only appropriate recipient of agricultural extension services. Many leaders of agricultural development efforts also mistakenly assume agricultural knowledge-sharing flows freely between the men and women of a household; however, this is often not the case (Fong & Bhushan, 1996; Manfre et al., 2013). This gender inequality has been reported in Ethiopia, where regardless of their involvement with agricultural activities, males reiterated that “women do not farm” (Mogues et al., 2009, p. 9). Therefore, women are often reduced to the role of only being *a farmer’s wife* (Nguyen et al., 2019; Rola-Rubzen et al., 2020). Because of this, women are overlooked as potential students, and their farming contributions are depicted as *help* rather than an intellectual (Rola-Rubzen et al., 2020).

Another contextual factor regulating opportunities for women in this region is that most extension agents are male (Akeredolu, 2008). In some countries in Sub-Saharan Africa, heavy restrictions about women interacting with males outside of their families remain. Although female extension agents exist, they focus primarily on providing women with education about household management and female reproductive issues rather than agriculture (Mogues et al., 2009). Additionally, cultural norms and restrictions often prevent women from speaking when they participate in educational opportunities for agriculture (Manfre et al., 2013). As a result, women are effectively blocked from receiving access to agricultural extension services. Several other contextual-based factors have been reported regarding women’s lack of participation in extension. In particular, women in Sub-Saharan African do not participate because they (a) fear a violent response from men, (b) worry about expressing themselves in a public setting in which they lack power, (c) believe their views would be discarded, (d) lack agency regarding decision-making, and (e) time constraints (Mogues et al., 2019). As a result, women remain relegated to specific agricultural tasks because of deeply entrenched cultural norms on gender that work to devalue and minimize their roles in the agricultural industry (Mogues et al., 2009).

## Conclusions

We conclude that across the two regions, three dominant gender inequalities persist: (1) access to land ownership, (2) power in decision-making, and (3) male control of agricultural extension services. We also conclude that the gender inequalities identified in this investigation were deeply contextual and vary in how they are operationalized across regions. As a result, it was critical to draw comparisons between the findings from each region (see Table 1).

**Table 2**

### *A Comparison of Gender Inequalities in Southeast Asia and Sub-Saharan Africa*

Gender Inequality	Southeast Asia	Sub-Saharan Africa
Access to Land Ownership	<ul style="list-style-type: none"> <li>• Women have legal rights to land and property</li> <li>• Women possess little control over the use of their land</li> </ul>	<ul style="list-style-type: none"> <li>• Most women lack legal rights to own land and property</li> </ul>



Power in Decision-Making	<ul style="list-style-type: none"> <li>• Women hold joint or sole decision-making power</li> <li>• Spending and credit-based decisions are made cooperatively</li> </ul>	<ul style="list-style-type: none"> <li>• Women's roles in agriculture have been largely controlled by males</li> <li>• Men regularly overrule decisions and do not share knowledge with women</li> </ul>
Male Control of Extension Services	<ul style="list-style-type: none"> <li>• Women lack access to extension, despite having more direct contact with agents</li> <li>• Women gain new knowledge about agriculture from female peers and magazine publications, rather than extension agents</li> </ul>	<ul style="list-style-type: none"> <li>• Most extension agents are male</li> <li>• Cultural norms and restrictions often prevent women from speaking when, and if, they do participate in extension</li> <li>• Women are effectively blocked from receiving extension services</li> </ul>

Access to land ownership demonstrated that considerable variation existed between Southeast Asia and Sub-Saharan Africa. As such, we conclude that women in Southeast Asia are likely to possess legal rights, specifically the ability to own land and property (Nguyen et al., 2019). Nevertheless, women in this region lack awareness about their land ownership status and often do not possess the power needed to control their resources (Akter et al., 2017; Nguyen et al., 2019). In Sub-Saharan Africa, however, women cannot legally own land and have little influence over the use of their family's property (Bosch et al., 2014). As a result, we conclude that males primarily regulate women's agency regarding land ownership and resource use in both regions. The second gender inequality, power in decision-making, revealed other key differences between Southeast Asia and Sub-Saharan Africa. As an illustration, women in Southeast Asia often reported exhibiting joint or sole decision-making power (Akter et al., 2020). Further, in decisions involving household finances and management, women's influence has been reported to be even more prominent in this region (Akter et al., 2017; Colfer et al., 2015). However, in Sub-Saharan Africa, women were less likely to be consulted about agricultural and farming-related decisions (Ogunlela & Mukhtar, 2009). Consequently, we conclude that women in Southeast Asia have been more empowered to make agricultural decisions than those in Sub-Saharan Africa.

We also conclude that sociocultural perceptions greatly influence the power women in agriculture exhibit in Southeast Asia. This notion materializes through the symbolic power associated with machinery and equipment usage. For example, in Southeast Asia, agricultural technology has continued to be created for the male physique (Kawarazuka et al., 2018). Ultimately, this has limited women's access to agricultural innovations (Rola-Rubzen et al., 2020). Additionally, men in Southeast Asia were likely to associate the ability to use machines with greater decision-making power, as depicted in data from Vietnam (Kawarazuka et al., 2018; Rola-Rubzen et al., 2020). Therefore, we conclude that these sociocultural perceptions limit women in Southeast Asia's access to education and professional development opportunities in agriculture, especially those designed to diffuse new agricultural technology. This concept aligns with the data reported by Kawarazuka et al. (2018) and Rola-Rubzen (2020). For the final gender inequality identified in this investigation, male control of extension services, we conclude that stark similarities and differences existed between Southeast Asia and Sub-Saharan Africa. For example, both regions promoted the caricature of *the farmer's wife* to regulate women to gender-based tasks and roles in agriculture. As a consequence, in both regions, women are often overlooked and even purposefully excluded from agricultural extension programming (Rola-

Rubzen et al., 2020). This finding supports the work reported by other researchers in agricultural and extension education (Richardson & Roberts, 2020; Roberts & Edwards, 2017).

Moving forward, we recommend that a targeted agricultural extension approach be created to empower women in both regions. For example, women in Southeast Asia need more knowledge about their rights as property owners so that they can better mobilize resources to build capital and scale their agricultural enterprises. We also recommend that a targeted recruitment effort be created to encourage females to become agricultural extension agents in Sub-Saharan Africa. By increasing the number of females in this profession, perhaps the cultural taboos and norms that discourage women's interactions with male extension agents could be alleviated (Fong & Bhushan, 1996; Manfre et al., 2013). Agricultural extension professionals should also emphasize improving (a) networking opportunities with other women and extension agents and (b) information about technology and mechanization of domestic and household management duties. By introducing women to technological advancements that target domestic and household tasks, perhaps this could help minimize time constraints and encourage them to seek out and attend new professional development opportunities (Satyavathi et al., 2010).

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# **From Privilege to Advocacy: The Cultural Growth Experienced by Secondary Agricultural Education Teachers During an International Experience to Costa Rica**

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## **Introduction and Literature Review**

As the world has become more globally interdependent, the need for cultural competence has become important for secondary teachers across subject areas (Santoro & Major, 2012). On this point, Ting-Toomey and Dorjee (2018) explained that by 2050 U.S. secondary classrooms will experience a seismic shift regarding the demographic composition of their student population, in which more than 20% will be immigrants. As a result, teachers will be expected to navigate cultural differences to help their students connect with the curriculum more intimately (Ott, 2021). These changes to U.S. student demographics will be significant for disciplines such as agriculture, which relies on migrant workers to harvest and process a variety of commodities (Robinson, 2018). Consequently, improving the global and cultural knowledge of secondary agricultural education teachers has become critical (Conner & Roberts, 2013; Gorter et al., 2020; Wright et al., 2019).

To this point, previous research on agriculture has primarily focused on examining undergraduate students' global beliefs, knowledge, motivations, and skills (O'Malley et al, 2019, Pigg et al., 2020, 2021; Briers et al., 2010; Bunch et al., 2013; Foster et al., 2014; Heinert & Roberts, 2016; Murphrey et al., 2016). However, Conner et al. (2017) reported that a panel of experts reached a consensus on 24 international agricultural concepts that should be incorporated into the secondary agricultural education curriculum. The concepts represented five primary topic areas: (1) production, (2) business, (3) culture, (4) environment, and (5) global awareness (Conner et al., 2017). Therefore, educating secondary students about these global agricultural concepts should be a priority for secondary agricultural education teachers (Conner et al., 2017).

Beyond identifying critical concepts for teaching international agriculture, some research (Brooks & Williams, 2001; Gorter et al., 2020) has advanced international experiences for secondary agricultural education teachers to gain the knowledge and skills they need to globalize their curriculum. For example, Brooks and Williams (2001) reported that after a five-day

international experience in Costa Rica, secondary agricultural education teachers reported they felt more prepared to teach global concepts to their students. Meanwhile, Gorter et al. (2020) suggested that an international experience for secondary teachers in Ecuador led to changes in their: (a) classroom practices, (b) personal and professional pursuits, and (c) attitudes and beliefs regarding global concepts. Despite this, little work has explicitly explored how international experiences for secondary teachers may lead to cultural growth that could positively influence agricultural education programs. This deficit in knowledge motivated the current study.

### **Conceptual Lens**

In this investigation, we used the Cultural Competence Model created by Winters Group (n.d.) as our conceptual lens. The four-stage model describes the linear development that an individual undergoes to become more culturally competent: (1) cultural awareness, (2) cultural knowledge, (3) cultural sensitivity, and (4) cultural competence (Winters Group, n.d.). The four stages must be achieved in successive order before an individual can progress to the next phase. Cultural awareness, the first stage of the model, represents how individuals question their assumptions and beliefs after interacting with a new culture. The second stage, cultural knowledge, describes how individuals consider how knowledge from a different culture is similar and different from their own. This stage also requires the individual to assess whether they need greater awareness and knowledge in the future. Meanwhile, cultural sensitivity reflects how an individual begins to investigate their ability to accept and respect others. The final stage, cultural competence, occurs when the individual makes the behavioral and psychological adjustments needed to navigate across cultures successfully. In agriculture, Bunch et al. (2018) and Rampold et al. (2020) have used this model to examine the growth of undergraduate students during international experiences. However, this lens does not appear to have been previously used to examine the progression of secondary agricultural education teachers' cultural competence.

### **Background of the Study**

For this study, eight secondary agricultural education teachers from Louisiana engaged in a one-week international experience in Costa Rica. The experience was funded through a USDA-NIFA Grant (USDA-NIFA-AFRI-2020-67037). During the international experience, the teachers engaged in a range of opportunities to interact with academic and agricultural experts regarding topics such as animal science, coastal loss, coffee and cacao production, environmental education, plant science, and more. During these interactions, the teachers also collected four forms of data (1) photographs, (2) video, (3) documents, and (4) audio recordings of interviews with experts. Each teacher then used the data they collected in Costa Rica to create three instructional case studies, i.e., 24 total. The case studies will be distributed to all secondary agricultural education teachers in Louisiana to globalize the agricultural education curriculum after the completion of the grant. Through this approach, we intended to provide secondary



agricultural education teachers in Louisiana with the curriculum resources they needed to cultivate 21st Century leaders prepared to solve complex problems across cultures.

### **Purpose of the Study**

The purpose of this study was to examine the cultural growth of secondary agricultural education teachers from Louisiana after an international experience in Costa Rica. One research question guided the investigation: Did secondary experience any changes regarding their cultural competence during an international experience to Costa Rica?

### **Methodology**

We grounded this investigation in Stake's (1995) instrumental case study design to achieve the study's purpose. We bounded the case by place and time, i.e., the secondary agricultural education teachers were from Louisiana and engaged in an international experience to Costa Rica in July 2021. We also embedded Lincoln's and Guba's (1985) standards of qualitative quality into the design of this investigation to promote rigor.

Of the teachers, six identified as female and two as male. Meanwhile, their years of teaching experience ranged from three to 28 years. Participants were selected through a competitive application process to ensure diversity regarding years of teaching experience and qualifications. We required the teachers to submit the following daily reflections: (a) audio reflections of their most salient experiences abroad, (b) a photograph and caption of their most significant cultural takeaway, and (c) a photograph and caption of their most significant educational takeaway. We mobilized the 56 audio recordings and 112 photographs and captions as data for this investigation. We further triangulated the data through persistent observations and a two-hour focus group interview with all eight participants on the final day of the international experience (Patton, 2002). Because of limited space, this abstract did not feature the participant-submitted photographs; however, they were included in our analysis.

To analyze the data, we used Saldaña's (2021) qualitative coding procedures. During the first cycle of coding, all data sources were coded using structural, descriptive, and in vivo approaches (Saldaña, 2021). This process resulted in 1,341 initial codes. Then, we used axial coding to scrutinize relationships among the open codes and reduced them into 17 categories. Thereafter, we met as a research team to negotiate our analytic discrepancies. We also employed thematic analysis to reduce the findings further and emerge the study's four themes during this phase.

### **Findings**

Through our analysis of the data, four themes emerged (1) privilege, (2) over-generalized assumptions, (3) critical comparisons, and (4) cultural advocates. The themes tell the story of

how the secondary agricultural teachers experienced cultural growth during their international experience in Costa Rica.

### **Theme #1: Privilege**

In the first theme, the secondary teachers articulated how their privileged worldviews made their transition to Costa Rican culture challenging. For example, during our observations, we noted that many participants described how the language barrier was a source of discomfort. Further, in a daily reflection, Participant #6 suggested that: “Costa Ricans should be more fluent in English.” Another discomfort expressed by the participants was that their housing accommodations lacked air conditioning, hot water, and high-speed internet. On this point, Participant #2 suggested they “weren’t prepared for the no AC....” We also captured fieldnotes regarding participants’ lack of appreciation for Costa Rican customs and traditions on their first day in the country. For example, the teachers made several inappropriate jokes and comments that suggested they did not value the cultural differences they observed. Despite this, the secondary agricultural education teachers’ privileged worldviews and cultural biases appeared to create a basis for gaining more profound cultural awareness as they gained a deeper understanding of a different culture during their time in Costa Rica (Winters Group, n.d.).

### **Theme #2: Over-Generalized Assumptions**

The second theme, over-generalized assumptions, represented how the secondary agricultural education teachers drew broad conclusions based on limited experiences during their initial days of their international experience. For example, during observations, we noted that after visiting an agricultural university, the teachers expressed a misconception that *all* Costa Ricans were highly educated and overwhelmingly proactive regarding sustainability. Moreover, during a reflection, Participant #1 advanced an over-generalized assumption of the Costa Rican people: “everybody lives to work here....they work very hard for very little.” The participants also assigned broad statements to communal life in the country. For example, Participant #7 said: “people [in Costa Rica] take pride in how their community looks.” Although the sites that the secondary agricultural education teachers visited during their international experience emphasized sustainability, they assumed the entire country shared this attitude. The teachers also expressed that Costa Ricans had a monolithic view regarding climate change and recycling that, perhaps, was not based in reality. As a result, the teachers had begun to gain more cultural awareness; however, their competence appeared to be in its early formation (Winters Group, n.d.).

### **Theme #3: Critical Comparisons**

The third theme, critical comparisons, emerged during the mid-point of the international experience when the teachers began making critical comparisons between Costa Rica and the U.S. In particular, after the teachers were exposed to various aspects of the country's culture and traditions, they began to juxtapose such against a perceived lack of similar values in the U.S. As an illustration, the participants contrasted the Costa Rican slogan, *¡Pura Vida!*, meaning simple or pure life, with the productivity-focused culture that they had experienced in the U.S. Further, in the focus group interview, the teachers spoke about how the U.S. was "very fast-paced" (Participant #1) and "...disjoined from everything else happening [in the world]" (Participant #4). In contrast, Participant #8 noted that Costa Rican citizens appeared to be "somewhat in tune to what's going on in their country..." and "more carefree...." We also captured in our fieldnotes how the teachers made pointed observations regarding Costa Rica's infrastructure, amenities, and use of resources throughout the trip that differed from U.S. practices. Such comments appeared to indicate that the participants had begun to gain more cultural knowledge.

#### **Theme #4: Cultural Advocates**

In the fourth theme, cultural advocates, the teachers began to experience shifts. For instance, they expressed intentions to champion cross-cultural understanding through sharing knowledge with their students and acting as change agents in their local communities. Case in point, toward the conclusion of their international experience, the teachers expressed excitement regarding the knowledge and resources they had gathered while in Costa Rica that they hoped to share with their students, colleagues, and community. In particular, the teachers were excited to use photos and videos from their experiences to supplement their current lesson plans and teach agricultural and environmental concepts in new ways moving forward. On this point, Participant #2 explained that using visual content from his experience could "immerse students" in concepts from a different perspective. Beyond sharing their experiences, the teachers expressed a desire to return to Costa Rica, or a different country, with their students and other agricultural education teachers.

The participants also explained that because of their international experience, they wanted to create change by helping others understand the importance of cross-cultural learning. In an emotional, teary-eyed response during the focus-group interview, Participant #7 shared that encouraging her peers to *engage in* and *teach* agricultural concepts from a cross-cultural perspective could help restore "veteran teacher passion." Further, Participant #3 reported in her reflection that the international experience "...[helped her] find that passion [for teaching again]." Despite the teacher burnout and attrition problem in Louisiana, Participant #4 hoped that "sharing [their] experiences" with their peers could motivate them to reimagine their curricular approaches.

When discussing the impact that the international experience had on her during the focus group interview, Participant #2 acknowledged that she hoped to use the knowledge gained while in Costa Rica to “rethink [her] approach” when teaching students in secondary agricultural education. In fact, all participants expressed that they hoped to inspire other teachers to use the case studies and other curricular resources they developed while in Costa Rica. The teachers also articulated that they wanted to become change agents in their communities after they returned home. When speaking about the importance of cross-cultural knowledge and skills, Participant #8 explained: “It’s going to start with us...it doesn’t have to be a big change...small changes can make a big impact.” As a result, the secondary agricultural education teacher in this investigation suggested that they hoped to become cultural advocates after they returned to the U.S. Such a notion did not appear to be addressed in the Winters’ Group (n.d.) cultural competence model.

### **Conclusions, Implications, and Recommendations**

This study sought to examine the cultural growth of secondary agricultural education teachers after an international experience in Costa Rica. Based on the findings of this investigation, we conclude that the international experience expanded the teachers’ cultural competence in critical ways. Therefore, we recommend that decision-makers in states examine ways to promote and, potentially, fund international experiences for secondary agricultural education teachers.

At the beginning of their experience in Costa Rica, the teachers expressed that the lack of particular privileges, i.e., air conditioning and hot water, caused them discomfort. They also articulated over-generalized assumptions of Costa Rica based on limited interactions and experiences in the country. Despite these challenges, we conclude that such appeared to catalyze greater cultural knowledge for the teachers in this investigation (Winters Group, n.d.). Although such a notion has been explored in research on undergraduate students (O’Malley et al., 2019, Pigg et al., 2020, 2021), this does not seem to have been reported in the literature on international experiences for secondary agricultural education teachers. As such, we recommend that individuals who lead international experiences explore strategies for helping secondary teachers process the cultural challenges they may encounter while in a different country.

After the teachers became more acclimated, they began to engage in critical comparisons between Costa Rica and the U.S. As an illustration, many participants suggested that it was interesting to compare their fast-paced routines to Costa Ricans who seemed to approach their lives in a more relaxed, balanced way. We conclude that these critical comparisons helped the teachers gain greater cultural sensitivity (Winters Group, n.d.). In the final theme we described that at the conclusion of the international experience, the participants articulated they planned to advocate for greater cross-cultural understanding for their students and communities. This notion did not appear to have been articulated in the Winters Group (n.d.) cultural competence model;

therefore, we suggest that future theory-building efforts examine whether this concept should be explored further.

Previous research (Brooks & Williams, 2001; Gorter et al., 2020) has reported that international experiences for secondary teachers inspired them to incorporate more global concepts into their curriculum – this investigation further supported this notion. However, our findings also add to the knowledge base by suggesting that international experiences may be a strategy for addressing teacher burnout and retention. Consequently, this finding warrants more attention from teacher educators, researchers, and state agricultural education leaders moving forward.

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**The One-Way (Agri)Cultural Mirror: A Case Study of How Young Agricultural Leaders Understand and Experience Culture**

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## **The One-Way (Agri)Cultural Mirror: A Case Study of How Young Agricultural Leaders Understand and Experience Culture**

### **Introduction and Purpose**

As the global economy continues to transform how society operates, cultural competence has become a buzzword in education, research, government, and healthcare (Gallus et al., 2014; Gay, 1994). Literature across various fields, including agriculture, has explored concepts related to cultural competence; however, empirical evidence on this topic is in its infancy, especially in agriculture (Gallus et al., 2014; Horvat et al., 2014; Moncloa et al. 2019; Suh, 2004). The economic, political, and social implications of the blurring of national borders have resulted in agriculture being an industry that thrives on the momentum of the global economy (Robinson, 2018). As such, agricultural education in the U.S. public education system has recognized the need for culturally competent high school graduates (Grant, 2020; Vincent & Torres, 2015; Woods, 2004). The shifting demographic of the agricultural industry has introduced a variety of cultural diversity issues, such as educational content ethnocentrism and cultural exclusion through educational policy, whereby secondary agricultural education struggles to foster culturally competent graduates that are prepared to operate in a globalized agricultural workforce (Grant, 2020; Vincent & Torres, 2015; Woods, 2004). To improve agricultural educational programs and foster the development of new professional development programs, a need existed to better understand the status of cultural competence in the agricultural industry. Therefore, this investigation aimed to address a deficiency in knowledge regarding the cultural competence of young agricultural leaders. The purpose of this study was to understand how young agricultural leaders understood and experienced cultural competence in Louisiana. One research question guided this investigation: What was the cultural competence of young agricultural leaders in Louisiana?

### **Conceptual Framework**

The Winters Group (n.d.) Cultural Competence Model™ described the stages an individual should undergo to reach and maintain cultural competence. The four components of this model are: (1) cultural awareness, (2) cultural knowledge, (3) cultural sensitivity, and (4) cultural competence (Winters Group, n.d.). During the first stage of cultural awareness, an individual questions their own beliefs, values, and cultural norms, as well as those of others (Bunch et al., 2018; Rampold et al., 2020; Winters Group, n.d.). In the cultural knowledge phase, an individual analyzes the differences between their culture and the culture of others (Bunch et al., 2018; Winters Group, n.d.) and realizes what is needed to comprehend unfamiliar cultures (Bunch et al., 2018; Winters Group, n.d.). In the cultural sensitivity phase, an individual analyzes their own ability to be accepting and tolerant of others' cultural beliefs, values, and norms (Bunch et al., 2018; Winters Group, n.d.). During the final phase, an individual determines the ongoing lifestyle modifications required to maintain a personal and professional culturally competent life (Bunch et al., 2018; Winters Group, n.d.). It is vital to note that progression through this model is consequential; therefore, it is dependent on the individual's advancement throughout each phase. As such, an individual cannot progress to the next phase without completing all phases preceding it.

### **Methodology**

This qualitative investigation was grounded in Stake's (1995) instrumental case study approach. In accordance with Stake (1995), this investigation was bound by program, place, and time. Specifically, we examined the case of Louisiana Farm Bureau Federation Young Farmers and Ranchers (LFBFYFR) program in 2020-2021 to provide insight into the phenomenon of cultural competence for young agricultural leaders in Louisiana. Participants in this investigation were from 23 to 34 years old. Further, three identified as female and two as male. The population of interest was selected because of their active engagement in the program and agricultural industry. The LFBFYFR members were highly connected socially, professionally, and politically in the agricultural industry in Louisiana. Therefore, they served as an ideal population to better understand the cultural competence of Louisiana young agricultural leaders. This was especially critical since Louisiana has had an economically and culturally vibrant agricultural industry with more diversity than the national average (USDA NASS, 2014).

### **Reflexivity and Qualitative Quality**

To accurately represent research findings, an explanation of our biases and experiences regarding cultural competency and the data must be addressed. We are advocates of culturally competent systems and the progression of culturally competent ideals in agriculture, including education, production, and business. It is critical to note that these factors may have influenced the interpretation of data to favor the continued establishment and progression of cultural competence in the agricultural industry. To reduce these influences and uphold quality and rigor in this investigation, we utilized Tracy's (2010) criteria for excellent qualitative research. Tracy (2010) stated that the following must be present in a qualitative study to be considered excellent research: (a) worthy topic; (b) rich rigor; (c) sincerity; (d) credibility; (e) resonance; (f) significant contribution; (g) ethics; and (h) meaningful coherence. Through the meticulous adherence to Tracy's (2010) qualitative quality standards, this scholastic inquiry achieved its objectives and maintained a rich, rigorous investigation.

### **Data Collection**

To reach the target population, we contacted LFBFYFR to recruit participants using a criterion-based sampling procedure (Creswell & Plano Clark, 2018). Through an organizational liaison, we solicited members to participate in the study. Additionally, we utilized a snowball sampling method, whereby study participants then nominated other individuals who might fit the study's parameters (Creswell & Plano Clark, 2018). In total, five volunteers agreed to participate. In this investigation, participants were identified by the pseudonyms Tom, Paul, Mary, Amy, and John.

Due to the COVID-19 pandemic, interviews were conducted through Zoom software. Using electronic mail correspondence, informed consent was obtained, and individual interviews were scheduled with participants. Before conducting the interview, voluntary consent was reviewed to ensure participants understood all elements of the investigation. Once participants expressed verbal consent, a semi-structured interview was conducted. During the one-hour interview, participants were asked questions such as, "What does culture mean to you?" "What are your experiences professionally with other cultures?" "From your perspective, what are the attributes of a culturally competent individual in the agricultural industry?" The interview audio was

recorded and transcribed verbatim via Descript transcription software. We then reviewed transcriptions to ensure congruency and accuracy with the original audio. Finally, we captured our observations through fieldnotes regarding participants' settings, atmosphere, and emotions to triangulate the study's findings.

### **Data Analysis**

To analyze the data, three rounds of coding were used to identify emergent findings. We utilized the coding procedures advanced by (Saldaña, 2021). In the first coding cycle, we implemented descriptive, values, and InVivo approaches, which allowed us to emerge participants' underlying worldviews and perspectives (Saldaña, 2021). During second cycle coding, we used axial coding to reduce open codes into categories. Through this coding methodology, axial codes were then patterned into relevant categories, whereby nine axial code categories were established. After first and second cycle coding process, we then utilized thematic analysis to story the data and interpret the axial codes into emergent themes using the Winters Group (n.d.) Cultural Competence Model as our lens.

### **Findings**

Using Stake's (1995) instrumental case study approach, four themes emerged that represented how the culture was understood and experienced by the young agricultural leaders: (a) cultural anxiety, (b) cultural pressure, (c) the one-way (agri)cultural mirror, and (d) cultural lens expansion.

#### **Theme #1: Cultural Anxiety**

Throughout this investigation, the participants expressed apprehension and cultural anxiety when articulating differences regarding the cultural competence of professionals in the agricultural industry. This cultural anxiety appeared to be a result of a perceived social risk associated with the discussion of cultural topics. For example, participants noted their own and others' hesitancy to discuss culture because they feared social ramifications. One concerned participant, Mary, was interested in the "angle" of the research. Further, she was visibly closed off throughout data collection. She explained that this behavior had to do with the uncertainty of social perception from others, explaining: "In today's social media culture, [culture] is just not something that anyone wants to touch with a ten-foot pole." She continued, "I feel like a lot of people don't know how to approach the topic because they don't want to be perceived as insensitive or ignorant." As such, participants preferred avoidance of the topic of cultural differences to mitigate the risk of offending others of a different cultural identity. Participants also expressed hesitation in addressing cultural differences or participating in culturally focused conversations because they perceived it could negatively affect them personally or professionally. Therefore, anxiety and avoidance to discuss cultural topics for fear of the negative ramifications weighed heavily on participants' minds, actions, and beliefs when considering their interactions with other cultures in agriculture.

#### **Theme #2 – Cultural Pressure**

Participants in this study noted the extrinsic motivation and professional pressure to be a culturally competent individual in the agricultural industry in Louisiana. All five young agricultural leaders in this investigation noted the indisputable presence of different forms of cultural diversity, including nationality, gender, age, sexual orientation, and native language in the industry. As John explained, “Every farm is culturally diverse... all across the state of Louisiana.” The young agricultural leaders also seemed to desire cultural competence largely because of social pressure to adapt to this standard to succeed in the industry. For example, the participants perceived that not being culturally competent could negatively affect their reputation, decrease job satisfaction, and possibly decrease their revenues. As John explained, “I think that if a farmer, or any employer for that matter, didn’t respect the people who work for them, they wouldn’t be employers.” Therefore, the young agricultural leaders in this study primarily seemed to value cultural competence because it directly influenced their businesses. Paul added that cultural competence is “definitely important.” He explained the personal benefits of cultural competence by stating, “You are only benefiting yourself and your working environment by asking questions and learning.” As a result, the motivation for cultural competence in the agricultural industry appeared to be primarily extrinsically influenced because of the cultural pressure they perceived.

### **Theme #3 – The One-Way (Agri)Cultural Mirror**

Although the participants reported feeling pressure to embrace cultural competence, they also argued that agriculture was a separate and distinct cultural group. They believed the public should make a more significant effort to understand their unique intricacies rather than adapting to the expectations of others. As a result, the third theme emerged in the form of a metaphor: *The One-Way Cultural Mirror*. As an illustration, when consumers look through the one-sided mirror, they observe agriculturalists from afar and make judgments based on sociocultural norms. However, when the young agricultural leaders in this study looked through the mirror, they could only see themselves and were blocked from understanding the values and traditions of others. As a result, a disconnect emerged by which agriculturalists and the public struggled to understand one another, which appeared to hinder further agricultural literacy efforts greatly. When discussing the culture of the agricultural industry, the participants expressed pride and reverence for the industry because they perceived it upheld family, religion, and shared professional values. Tom explained, “family values and religion meld real good with agriculture.” Meanwhile, John maintained: “I find agriculture is its own culture of people... We might not have the same skin color and the same beliefs...but we’re all a really underappreciated group.”

Although participants in this study identified agriculture as a unique cultural group, they also acknowledged that the profession has challenges connecting with their consumers. Mary noted that this one-way cultural view could often be observed by examining the public perceptions of labor practices in agricultural production. She described her frustration by explaining, “people [who are] not in agriculture assume that when we have immigrant labor, that they’re illegal Mexicans...and that just couldn’t be further from the truth.” Despite this, several of the participants did articulate a way forward. For instance, Tom explained that he aimed “to be more of an advocate for what [he] believes in as an agriculturalist.” He further described how he could “help to bridge that gap” with the public through his work.

Participants in this study also expressed a necessity for both producers and consumers to promote more understanding. Paul explained that when operating in a culturally diverse setting, effort to progress cultural competence must be, unequivocally, “on both sides.” Additionally, he believed that it must be a reciprocal effort to cross language, communication, and cultural barriers. Because of the lack of cultural competence on both sides, the one-way agricultural mirror hindered the ability of production agriculturalists to market commodities to a consumer population, who have historically lacked agricultural literacy. Nevertheless, the participants in this investigation realized a need to bridge these barriers to accommodate a new consumer demographic, which is further removed from production agriculture than ever before.

#### **Theme #4 – Cultural Lens Expansion**

Participants in this study reported making strides to expand their cultural lens and alter their perspectives of other cultures through three emergent subthemes: (a) education, (b) domestic experiences, and (c) international experiences.

**Subtheme 1 - Cultural Lens Expansion Through Education.** Participants described how their cultural lens was initially developed and expanded through their formal educational experiences. As John described, “growing up in schools where other ethnicities are present, [the school] did a good job of trying to get [individuals of other cultures] to share information about their culture.” This cultural exposure was further extended as young agricultural leaders advanced their education in a higher education institutions. Amy noted that she never realized that she possessed her own cultural identity before starting college. She explained, “College is probably when I started learning about other people’s traditions and learning that I had traditions I had no idea about.” Participants also expressed gratefulness for the cultural experiences in formal education that allowed them to elevate their cultural awareness and knowledge. With a foundation of cultural awareness and knowledge through education, the young agricultural leaders entered the workforce prepared to expand their cultural lens further.

**Subtheme 2 - Cultural Lens Expansion Through Domestic Experiences.** The participants began to develop their cultural perspectives further as they entered the agricultural workforce. In particular, the young agricultural leaders described how both domestic and international travel experiences were equally advantageous but varied in applicability. When asked if domestic or international experiences were more beneficial, Tom reflected, “Both have been influential in my life. They’ve been influential differently, but to the same magnitude.” Participants noted that domestic experiences were more relevant to their agricultural businesses because of the direct applicability of agricultural knowledge gained in their industries. Mary, a high school agricultural educator, explained that her domestic experiences allowed her to gain insight into culture that have been beneficial to her career. She explained, “Professionally, domestic trips [were more beneficial] because as a teacher...it means more and is more teachable when I have experiences in the country.”

**Subtheme 3 - Cultural Lens Expansion Through International Experience.** Although domestic travel experiences were beneficial for gaining direct agricultural knowledge, participants noted that internationally based experiences were more beneficial on a personal level

to cultivate cultural competence. Paul explained: “The international trips gave me so much more perspective on life...but I don’t know at this point how much it will benefit me in my business.” Participants also saw value in experiencing other cultures, even though the experiences were applied to their daily life differently. Domestic experiences were viewed as more critical for business, whereas international experiences were articulated as more valuable for the personal development of cultural competence. However, all participants in this investigation were intentionally striving to increase their cultural competence to better themselves as professionals in the agricultural industry in Louisiana.

### **Conclusions and Recommendations**

The purpose of this study was to understand how young agricultural leaders understood and experienced cultural competence in Louisiana. Through our analysis of data, we concluded that cultural competence should be considered an integrated and vital professional value in Louisiana’s agricultural industry. Further, we conclude that the young agricultural leaders in this investigation were primarily in the cultural awareness and cultural knowledge phases of the Winters Group (n.d.) Cultural Competence Model. Although externally motivated, participants recognized the need for cultural competence professionally and socially. Therefore, we conclude that participants first initiated their journey to cultural competence through exposure to cultural diversity, and subsequent cultural awareness, in secondary and collegiate educational systems.

We also conclude that participants believed that the agricultural industry was a unique cultural group and noted that a cultural competence mindset was essential personally, professionally, and socially for producers and consumers. Additionally, participants noted that they desired expanded professional development opportunities regarding cultural competence through organizations, such as the Cooperative Extension Service and the Louisiana Farm Bureau Federation. Lastly, we conclude that domestic and international travel experiences were impactful in developing the young agricultural leaders’ cultural competence.

Moving forward, we recommended that professional development programs use domestic and international travel opportunities to facilitate measurable cultural competence outcomes. We also recommend that cultural competence programs be created for agricultural youth to introduce cultural diversity and cultural exploration at an earlier age. We also recommend that research be conducted on the intricacies of cultural competence in agriculture to expand the limited research on this phenomenon. A similar qualitative investigation should also be conducted to examine this issue across various states, regions, and countries. With this understanding, perhaps greater knowledge can be attained on the influence of the local context on young agriculturalists’ cultural competence. Additionally, future research should investigate the motivations and expectations of cultural competence in the agricultural industry. Supplemental research should also be conducted to investigate the phenomena of cultural avoidance, anxiety, and pressure in the agricultural industry to discern personal, organizational, and social approaches to counteract these barriers and promote culturally competent discussions. Further, research should be conducted to examine how the one-way cultural mirror identified in this investigation manifests between consumers and agriculturalists. This knowledge could help discern possible strategies and programs that could be used to overcome this barrier and promote cultural competence.

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## **Selected Factors Influencing College of Agriculture Student Retention**

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### **Introduction**

During the last decade, rejuvenated recruitment efforts by colleges of agriculture (COA) across the United States have successfully increased enrollments by 30% in Agriculture Food and Natural Resources (AFNR) degree programs (STEM Food and Ag Council, 2014). Despite substantial growth in COA enrollments, the gap between AFNR graduates and job openings requiring AFNR degrees widened (Setterbo et al., 2015). Similarly, current retention and graduation rates from post-secondary institutions do not trend statistically higher than historical rates (DeBerard et al., 2004; Porter, 1989; National Center for Education Statistics, 2019). According to the Bureau of Labor Statistics (2019), agriculturally related occupations in professional, scientific, and post-secondary education are forecasted to experience increased demand through 2026. New jobs created by 21<sup>st</sup>-century skills and a retirement exodus of skilled workers are anticipated to drive workforce demand, despite baby boomers (aged 54-72) are delaying retirement longer than their predecessors (Fry, 2019).

Similarly, school-based, agricultural education (SBAE) has rarely experienced a surplus of certified teachers. The most recent NAAE Teacher Supply and Demand Executive Summary indicated 76 SBAE programs went unfilled in 2016 and the most common reason for leaving the profession (22.5%) was retirement (Smith et al., 2018). Recent evidence suggests the inverse relationship – dwindling supply (retirement) coupled with increased demand (job creation) – hastens the need for COA to retain more students and persevere more graduates than ever before (Alston et al., 2019, 2020).

Efforts to measure how combined elements of academic, social, and emotional intelligence influence undergraduate student retention have resulted in models that have predictive value for various student demographics (Miller, 2005). Retention and perseverance are peculiar terms in educational research; retention refers to whether a student returns to college for a second fall semester regardless of age or classification while perseverance considers whether the student earned a degree (Office of Educational Research and Improvement, 2000). Both retention and perseverance of undergraduate students in COA are paramount when advocating for the relevance of agricultural degrees of study (Koon et al., 2009) as well as meeting the growing demands of the U.S. agricultural industry (Dyer et al., 1999). College admission standards such as ACT score, high school GPA, and class rank are salient units traditionally used to determine college readiness (Koon et al., 2009). Similarly, non-cognitive factors such as academic self-efficacy, time management, and self-discipline, among others, have been shown to have a positive association with retention of undergraduate students (Bowman et al., 2019).

### Conceptual Framework

*Grit* is defined as “perseverance and passion for long term goals” (Duckworth et al. 2007, p. 1087); it is a personality trait enabling one to employ extraordinary dedication to objectives that take months or even years to complete. Grit as a construct links directly Angela Duckworth’s work to ascertain a better predictor for achievement than cognitive measures like IQ and GPA. Grit has been measured using two self-reported scales. The original 12 item Grit-O had high internal consistency ( $\alpha = .78 - .85$ ); however, Duckworth and Quinn (2009) suggested room for improvement was warranted due to its comparative fit index (CFI). The shortened Grit-S, developed and validated by Duckworth and Quinn (2009) ,is more efficient (8 items), fits data better (internal consistency  $\alpha = .73-.79$ ), and is reliable (test-retest correlation  $r = .68, p < .001$ ). Duckworth and Quinn (2009) concluded Grit-S has superior trait-level psychometric features and equal predictive validity to the Grit-O and recommended the Grit-S for future research. Two subscales remain constant in Grit-O and Grit-S: (1) perseverance of effort and (2) consistency of interest (Duckworth & Quinn, 2009).

Using Grit-O, Duckworth et al. (2007) collected data from 139 undergraduate students at the University of Pennsylvania to predict performance, 1,218 West Point summer cadets to predict retention, and 273 finalists in the Scripps National Spelling Bee to predict final round achievement based on grit mediated by time spent practicing. The results of these studies mutually implied that attainment of arduous goals required more than natural talent; individual differences in grit explained statistically significant variance regarding outcomes over and above IQ, GPA, SAT, Whole Candidate Score (WCS), and self-control as measured on the Brief Self Control Scale (BSCS) (Tangney et al., 2004).

### Purpose and Objectives

The purpose of this study was to explore possible predictors (i.e., grit, ACT, first and second semester GPA, first generation status) of retention of the 2018 freshman class of the Louisiana State University COA. This research addresses Research Priority 3: Sufficient Scientific and Professional Workforce that addresses the challenges of the 21<sup>st</sup> century (Stripling & Ricketts, 2016). Specifically, this investigation aims to support Research Priority Question 3, “What competencies are needed for an agriculture and natural resource workforce?” The following objectives guided this study:

1. Describe selected personal characteristics of Louisiana State University COA freshman in the fall of 2018.
2. Determine if selected factors (i.e., grit, ACT, ARC participation, first generation status) are significant predictors of first semester GPA.
3. Determine if selected factors (i.e., grit, ACT, first and second semester GPA, first generation status) are significant predictors of retention of fall 2018 COA students at Louisiana State University

### Methodology

All Louisiana State University College of Agriculture freshmen ( $N = 242$ ) enrolled in *Introduction to Agriculture* served as the target population of this study. After IRB approval,

questionnaire data (personal characteristics and grit) were collected at the end of the fall 2018 semester through a Qualtrics online survey. Secondly, retention data and GPA were obtained during the summer of 2019 from the Louisiana State University Registrar and College of Agriculture student services office. A total of 170 students fully completed all parts of the online instrument, yielding a 70% response rate. The online survey instrument consisted of a researcher created personal characteristics section and Duckworth's (2007, 2009) eight-item grit scale. A reliability coefficient of 0.71 was found and determined to be acceptable for the current population. Face and content validity were evaluated by a panel of three agricultural education faculty members.

Data associated with objective one were analyzed by employing descriptive statistics, specifically frequency, percentage, and mean. Stepwise multiple linear regression was employed to meet the needs of objectives two. To measure practical effect,  $R^2$  was calculated to determine explained variance. Finally, Binary logistic regression was utilized to meet the needs of the third research objective due to the categorical nature of the dependent variable (e.g., retained or not) (Field, 2009). Additionally, Nagelkerke's  $R^2$  was calculated to determine the practical significance of the overall regression model. Nagelkerke's  $R^2$  is a measure of practical effect of logistic regression and is interpreted similarly to the classical  $R^2$  utilized to measure effect size in multiple regression (Field, 2009; Nagelkerke, 1991).

### Findings

Objective one sought to describe selected personal characteristics of Louisiana State University freshmen students in the fall of 2018. Overall, the majority of students were female ( $n = 144$ ; 85.2 %). Most students indicated their ethnicity Caucasian ( $n=117$ ; 68.8%), followed by African-American ( $n= 29$ ; 17.1%), Hispanic ( $n = 7$ ; 4.1%), Asian ( $n = 6$ ; 3.5%), Multiracial ( $n = 6$ ; 3.5%), and Native American ( $n =4$ ; 2.4%; see Table 1).

The goals of objectives two and three were to determine if selected personal characteristics and cognitive factors (i.e., first and second semester GPA, ACT score, and Grit) could predict first semester GPA, second semester GPA, and retention. The mean of first semester GPA was calculated to be 3.09 ( $SD$ : 0.80) and the mean of second semester GPA was 3.00 ( $SD$ : 0.89). These students' average ACT score was 25.12 ( $SD$ : 3.91) and grit mean was 2.58 ( $SD$ : 0.60).

Additionally, two categorical predictor variables were employed in the multiple and/or binary logistic regression models. In all, 68 (40.0%) of the students were a part of the Agriculture Residential College (ARC) program where students majoring in the COA live together in one residential hall and participate in specialized programming related to their majors and 36 (21.2%) identified as a first-generation student.

Table 1 provides a comparison of students retained ( $n = 156$ ) and those who left the university ( $n = 14$ ). Those students who were retained to Louisiana State University had an average GPA of 3.19, versus 2.25 for those who were not retained. In all, the retained students averaged a 25.21 on the ACT and had a 2.57 grit score. Approximately 19% of the retained students were first generation students, and just over 40% participated in ARC. Regarding students who left the university, they had an average ACT of just over 24 and had a grit score of 2.62. Approximately 43% of these student were first generation and almost 36% participated in the ARC program.

Table 1

*Comparison of those Retained (n = 156) versus not Retained (n = 14) to Louisiana State University*

Variable	<i>f</i>	%	<i>M</i>	<i>SD</i>
Retained	156	91.8	-	-
Fall GPA	-	-	3.19	.71
ACT Score	-	-	25.21	3.88
Grit	-	-	2.57	.61
First Generation	30	19.2	-	-
ARC Participation	63	40.4	-	-
Not Retained	14	8.2	-	-
Fall GPA	-	-	2.25	1.08
ACT Score	-	-	24.08	4.25
Grit	-	-	2.62	.50
First Generation	6	42.9	-	-
ARC Participation	5	35.7	-	-

Objective two sought to determine if selected factors (i.e., grit, ACT, ARC participation, first generation status) could predict first semester GPA. Table 5 depicts the bivariate correlations between the variables. Statistically significant and positive relationships ( $p \leq .05$ ) were found between ACT score and Fall GPA, and ARC status and ACT score. Further, statistically significant ( $p \leq .05$ ) and negative relationships were found between grit and Fall GPA, first generation status and fall GPA, and first-generation status and ACT score.

Table 5

*Bivariate Correlations Among all Study Variables*

Variable	Grit	ARC Status	First Generation	ACT Score	Fall GPA
Grit	1.00	-.086	.101	.008	-.251**
ARC Status	-.086	1.00	-.125	.131*	.067
First Generation	.101	-.125	1.00	-.399**	-.190*
ACT Score	.008	.131*	-.399	1.00	.431**
Fall GPA	-.251**	.067	-.190*	.431**	1.00

\*\* $p \leq .001$ , \* $p \leq 0.05$ . Note. Strength of relationships (Davis, 1971): .01–.09 = *Negligible*, .10–.29 = *Low*, .30–.49 = *Moderate*, .50–.69 = *Substantial*, > .70 = *Very strong*.

Regarding the regression model ARC participation and first generation status were not statistically significant predictors of Fall GPA in the stepwise model. However, ACT score and grit were both found to be statistically significant ( $p < .05$ ) predictors of first semester GPA (see Table 6). Overall, the model explained 25.1% of the variance in first semester GPA ( $R^2 = .251$ ).

Table 6

*Best-fit Linear Regression Model of Predictors of First Semester GPA*

Variables in Regression Model	$\beta$	Std. Error	<i>t</i>	Std. $\beta$	<i>p</i>
Constant	1.131	.355	3.186	--	.002
ACT Score	.082	.013	6.102	.433	.000
Grit	-.32	.089	-3.594	-.255	.000

Variables in Regression Model	$\beta$	Std. Error	$t$	Std. $\beta$	$p$
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*Note.*  $R^2 = .251$ ,  $F = 12.918$ ,  $p < .001$

Objective three sought to determine if selected factors (i.e., grit, ACT, first and second semester GPA, first generation status) predicted retention of the students to their second year. Prior to interpreting the logistic regression model, the Hosmer and Lemeshow Goodness of Fit (HLGF) test was calculated to determine model fit. Specifically, the HLGF ( $\chi^2_{HL} = 13.74$ ) was determined to be not statistically significant ( $\alpha > .05$ ), indicating acceptable fit of the model.

Overall, 156 (91.8%) of the students returned to Louisiana State University for their second year, with 14 (8.2%) leaving. In all, the model was able to classify 94.7% of the cases correctly. However, the initial model was able to classify 92.1% of the cases as well, indicating minimal improvement of classification due to the predictors. Overall, fall semester GPA was the only statistically significant predictor ( $Wald=4.93$ ;  $\alpha = 0.03$ ; see Table 8) to enter the model. Nagelkerke's  $R^2$  was calculated to determine practical significance of the overall regression model. The value of Nagelkerke's  $R^2$  was 0.28.

Table 8

*Logistic Regression of Retention*

Variable	$B$	$SE$	$Wald$	$df$	$p$	Odds Ratio
Fall GPA	1.33	0.60	4.93	1	0.03	3.77
Spring GPA	0.58	0.46	1.59	1	0.21	1.79
ARC	-0.37	0.77	0.23	1	0.63	0.69
First Generation	0.74	0.89	0.70	1	0.41	2.10
Grit	0.22	0.67	0.11	1	0.74	1.25
ACT Score	-0.14	0.11	1.42	1	0.23	0.87

*Note.*  $\alpha = .05$

**Conclusions**

The typical students enrolled in *Introduction to Agriculture* in the fall semester of 2018 was a Caucasian female. This is consistent with enrollment trends dating to at least the fall of 2014 and is also representative of the COA demographics. The average student came into Louisiana State University with an ACT score of just over 25 who earned a fall and spring GPAs of 3.00 and 3.09, respectively. Further, this student was likely not a first generations college student, nor was she involved in the ARC program. Further, the typical student had an average amount of grit per Duckworth's (2007, 2009) interpretive scale.

Prior research has reinforced the importance of freshmen year GPAs with retention (Ball et al., 2001; Garton et al., 2002; Koon et al., 2009). Results of this study indicated a positive, moderate relationship with ACT score and GPA of these student. Negative relationships with GPA were found between grit and first generations status. When examining the regression model, grit and ACT score were the only variables that predicted GPA. ACT was found to be a positive predictor of first semester GPA, which is similar to (Noble & Sawyer, 2002). Conversely, grit was shown to be a negative predictor of first semester GPA. This finding contradicts the findings of Duckworth et al. (2007) who reported grit as a positive predictor of GPA among psychology

students. Perhaps this group of freshmen undergraduates had not experienced enough situations to thoroughly develop grittiness. Additional research should be conducted to investigate this phenomenon further.

Fall semester GPA was the only variable found to be a significant predictor of retention. However, the improvement of the logistic regression model was just over 2%, indicated minimal improvement. This minimal improvement in classification ability is partially attributed to only 14 students out of 170 leaving the university. While statistically the majority of students returned to campus for their second year, efforts to understand factors attributing to attrition are warranted, as universities have the obligation to set students up for success.

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## **Relationships among Achievement Goal Orientation and Self-Efficacy in College of Agriculture Courses**

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### **Introduction**

Motivation is a critical component of academic success, however, finding ways to increase motivation in undergraduate students has been a perennial (Linnenbrink & Pintrich, 2002; Pintrich & Zusho, 2007). Thus, faculty members need to understand student motivation in order to create a classroom climate conducive to motivation and optimal learning (Svinicki, 2004). According to Schunk (2004), motivation is the cognitive process of beginning and maintaining goal-driven behaviors. Nevertheless, motivation is a complex concept that goes beyond a simple definition. Motivation has been shown to be context-dependent, malleable, and comprised of various factors including self-efficacy, interest and values, expectancy for success, attributions, and goals (Linnenbrink & Pintrich, 2002).

### **Literature Review/Theoretical Framework**

The theoretical framework guiding this study was Social Cognitive Theory (SCT; Bandura, 1986; 1997). SCT has proposed that individual learning occurs within a social context, and during the learning process people regulate their thoughts and actions through goal-setting, anticipating expected outcomes, evaluating their progress, assessing their confidence, and controlling their cognition, affect, and behaviors (Schunk, 2004). A cornerstone assumption of SCT has been the concept of triadic reciprocity, which suggests that environmental variables, personal factors, and behaviors interact concomitantly during the learning process (Ormrod, 2008; Schunk, 2004). The variables of interest in this study were the personal factors of goal-setting and self-efficacy, which Huang (2016) identified as the two chief theoretical concepts in achievement motivation.

According to SCT, goal-setting is a regulatory process whereby learners establish objectives, which subsequently determine the regulatory actions an individual takes to meet the objective (Ormrod, 2008; Schunk, 2004). Goal theorists have termed goal-setting as achievement goal orientation, and posited that individuals can occupy various positions in their goal orientations (Elliot & Church, 1997). Elliot and Church (1997) specified that classical goal orientation theories approximated that individuals held either an *approach* or *avoidance* goal orientation. The former indicated that an individual's goals were directed toward the attainment of success, while the latter suggested avoidance of failure. Later theories of achievement goal orientation proposed that orientations could be dichotomized into *mastery* and *performance*, where mastery goal orientation was directed toward developing competence, whereas performance goal orientation focused on appearance of competence in relation to others (Ames & Archer, 1988; Elliot & Church, 1997). Elliot and Harackiewicz (1996) recommended combining the *approach/avoidance* and *mastery/performance* concepts of goal orientation to create an integrative achievement goal orientation, which created three goal orientation positions: mastery, performance-approach, and performance-avoidance. Mastery and performance approach goals are associated with self-regulating behaviors to attain success either through task mastery or the appearance of competence in relation to peers (Elliot & Church, 1997). Conversely, performance-avoidance goals are associated with negative self-regulating behaviors that help an individual avoid failure, such as task distraction (Elliot & Church, 1997).

Self-efficacy was defined by Bandura (1986) as “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” (p. 391), and refers to an individual’s confidence in their ability to perform a task. Pajares (1996) posited that self-efficacy is situational and can vary depending on the task. For example, a student with high self-efficacy for reading may experience lowered self-efficacy when asked to read a scientific journal article. Self-efficacy should accurately reflect an individual’s skill ability; however, this is not always the case, especially when an individual is inexperienced within a specific task area (Schunk & Pajares, 2002). An individual’s self-efficacy can be influenced by several factors, including prior mastery experiences, messages from others, and vicarious experiences (Ormrod, 2008). Mastery experiences, which entails an individual previously successfully completing a task, have been shown to be the best builder of self-efficacy (Bandura, 1986). Continual mastery experiences enable an individual to more accurately ascertain their self-efficacy and ability level (Ormrod, 2008).

Theoretically, Elliot and Church (1997) described self-efficacy as an antecedent of achievement goal orientation. They submitted that high self-efficacy beliefs would drive an individual toward utilizing more approach goal orientations, either mastery or performance, while lower self-efficacy would be related with thoughts of failure leading to more avoidance goal orientations.

Self-efficacy has been studied extensively in the agricultural education literature over the last 15 years (McKim & Velez, 2016), however, goal orientation has received little attention (Splan et al., 2011), especially in relation to undergraduate student self-efficacy. Achievement goal orientation studies have shown that undergraduate agriculture students tended to report

mastery goal orientations at the highest level (DiBenedetto et al., 2016; Huff et al., 2016; Splan et al., 2011) and either performance-avoidance orientations (DiBenedetto et al., 2016; Huff et al., 2016) or performance-approach (Splan et al., 2011) at the lowest levels. Furthermore, Huff et al. reported that academic efficacy was a significant predictor of mastery and performance-approach goal orientations. Outside of agricultural education, Huang's (2016) meta-analysis of 148 studies found that almost half of the studies utilized the three-factor model of goal orientation (mastery, performance-approach, and performance avoidance), and the mean correlations between self-efficacy and the three goal orientations were: mastery ( $r = .43$ ), performance-approach ( $r = .19$ ), and performance-avoidance ( $r = -.08$ ).

Huang (2016) suggested that self-efficacy and achievement goal orientations were the two most important constructs in motivation, yet, little research has investigated the relationships between these two variables in agricultural education (McKim & Velez, 2016; Splan et al., 2011). This study aligns with recommendations by Edgar et al. (2016) for engaged learning in all environments. The purpose of this study was to examine the relationships among academic self-efficacy, mastery goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation. The following objectives guided this study:

1. To describe students' performance-approach, performance-avoidance, and mastery achievement goal orientations and course-specific self-efficacy in selected undergraduate agriculture courses;
2. To determine the relationships between course-specific self-efficacy and performance-approach, performance-avoidance, and mastery achievement goal orientations among students enrolled in selected undergraduate agriculture course;
3. To determine the unique variance in course-specific self-efficacy explained by performance-approach, performance-avoidance, and mastery achievement goal orientations.

## **Methods**

The population for this descriptive-correlational study was students ( $N = 1,538$ ) in 22 large enrollment ( $\geq 50$  students) undergraduate agriculture courses at the University of Arkansas during the fall 2021 semester. Six intact courses, with a total enrollment of 458 students, were randomly selected to participate in the study. After IRB approval, each instructor was contacted and agreed to allow their students to participate. Data were collected in five courses during a scheduled class using a paper instrument; data for the sixth course were collected using an online instrument. Usable responses were received from 401 students for an 87.6% response rate.

The data collection instrument consisted of three sections. Section I, based on Elliot and Church's (1997) *Achievement Goal Questionnaire (AGQ)*, contained six items measuring performance approach goal orientation, four items measuring performance-avoidance goal orientation, and six items measuring mastery orientation. All items were measured on a 5-point Likert scale (1 = *strongly disagree* and 5 = *strongly agree*). Strunk (2014) factor analyzed the AGQ and confirmed the validity of the three underlying goal orientations. Section II measured course-specific academic self-efficacy and was a modified form of the *Self-efficacy in Discipline*

*Scale* (Center for Higher Education Research and Scholarship, n.d.). This section contained five items measured on a 5-point Likert Scale (1 = *Not at all confident* and 5 = *extremely confident*). Wording of the self-efficacy items adhered to Bandura's (2006) recommendations. Section III consisted of six demographic questions including gender, age, academic college, whether the course was required, and whether or not the student was enrolled in the honors program.

*Post hoc* coefficient alpha reliabilities for each subscale in Section 1 were .84 (performance-approach), .70 (performance-avoidance), and .81 (mastery). The coefficient alpha reliability for the course-specific self-efficacy scale was .85. The reliability of Part III was not assessed because, according to Salant and Dillman (1994), questions about "personal attributes and behaviors produces very little measurement error" (p. 87). The instrument was evaluated by an expert panel consisting of three university faculty in agricultural education and survey design and was judged to possess face and content validity.

## Results

The typical respondent was 20.58 years ( $SD = 2.99$ ) old, identified as female (72.1%), was not participating in the honors program (81.4%), and reported the course in which they were enrolled was required for their degree program (62.3%). A plurality of students majored in AFLS (40.8%); the largest percentages of non-AFLS students were from the Colleges of Education and Health Professions (28.3%) and Arts and Sciences (24.8%).

Students had the highest mean score for the mastery goal orientation ( $M = 4.00$ ), followed, in order, by the performance-avoidance ( $M = 3.28$ ) and performance-approach ( $M = 3.13$ ) goal orientations (Table 1). Within the mastery goal orientation, the highest item mean (4.48) was for the statement, "I hope to have gained a broader and deeper knowledge of [course title] when I am done with this course." Within the performance-avoidance goal orientation the highest item mean (3.78) was for, "My fear of doing poorly in this class will motivate me." Finally, within the performance-approach goal orientation the highest item mean (4.04) was for, "I want to do well in this class to show my ability to my family, friends, advisor, or others."

Table 1

### *Academic Goal Orientation of Students Enrolled in Undergraduate Agriculture Courses*

Goal Orientation / Statement	<i>n</i>	<i>M</i>	<i>SD</i>
Performance Approach ( $\alpha = .85$ )	392	3.13	0.82
I want to do well in this class to show my ability to my family, friends, advisor, or others.	405	4.04	1.01
I am motivated by the thought of outperforming my peers in this class.	404	2.89	1.13
It is important to me to do well compared to others in this class.	402	3.11	1.09
I am striving to demonstrate my ability relative to others in this class.	400	3.08	1.05

My goal in this class is to get a better grade than most of the students.	401	2.92	1.09
It is important to me to do better than the other students.	405	2.74	1.05
Performance Avoidance ( $\alpha = .70$ )	397	3.28	0.84
My fear of doing poorly in this class will motivate me.	405	3.78	1.05
I often think to myself, “What if I do badly in this class?”	401	3.15	1.20
I worry about the possibility of getting a bad grade in this class.	403	3.42	1.21
I am afraid if I ask my instructor a “dumb” question, they might think I’m not very smart.	403	2.77	1.19
Mastery ( $\alpha = .81$ )	393	4.00	0.59
In a class like this, I prefer course material that really challenges me so I can learn new things.	402	3.37	0.94
I want to learn as much as possible in this class.	403	4.31	0.72
In a class like this, I prefer material that arouses my curiosity, even if it is difficult to learn.	403	3.99	0.91
I hope to have gained a broader and deeper knowledge of [course title] when I am done with this course.	404	4.48	0.66
It is important for me to understand the content of this course as thoroughly as possible.	402	4.18	0.71
I desire to completely master the material presented in this course.	404	3.68	0.90

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When students were classified by their highest mean goal orientation, 61.4% had a primary mastery goal orientation, 23.3% had a primary performance-avoidance goal orientation, 8.2% had a primary performance-approach goal orientation, and 7.1% had no primary goal orientation. Thus, students were primarily motivated by the goal of understanding course material and learning new content and skills; however, to a lesser degree, students also sought to avoid failure (performance-avoidance) and out-perform their peers (performance-approach) (Elliot & Church, 1997).

Student self-efficacy was measured specific to the course in which the student was enrolled. As shown in Table 2, students had a high level of self-efficacy ( $M = 4.06$ ) and were very confident they could complete all of the assigned work in the course ( $M = 4.62$ ), but were somewhat less confident they would remember the course material learned next year ( $M = 3.52$ ).

Table 2

*Student Course-specific Self-efficacy*

How confident are you that:	<i>n</i>	<i>M</i>	<i>SD</i>
You can complete all the work assigned in this class?	400	4.62	0.59
You will make a good grade in this class?	400	4.27	0.69
You can understand when complicated ideas are presented in this class?	400	3.96	0.76
You can learn all the material presented in this course?	401	4.09	0.79
You can do the hardest work that is assigned in this class?	401	3.95	0.93
You will remember what you learn in this course next year?	400	3.52	1.02
Self-efficacy ( $\alpha = .84$ )	397	4.06	0.59

*Note.* Based on a 1 (*Not at all confident*) to 5 (*Very confident*) Likert scale.

The intercorrelations between the mastery, performance-approach, and performance-avoidance goal orientations and course-specific self-efficacy are shown in Table 3 and were consistent with goal orientation theory (Elliot & Church, 1997). As theorized, the correlation between mastery and performance-avoidance goal orientations was near-zero and non-significant, while a significant negative correlation existed between performance-avoidance and self-efficacy. Mastery goal orientation had a significant positive correlation with self-efficacy and the performance-approach orientation and a significant negative correlation with the performance-avoidance goal orientation.

Table 3

*Intercorrelations between Academic Goal Orientations and Self-Efficacy*

Variable	X1	X2	X3	X4
Mastery (X1)	1.0	.02 <sup>NS</sup>	.27 <sup>***</sup>	.42 <sup>***</sup>
Performance-avoidance (X2)		1.0	.24 <sup>***</sup>	-.27 <sup>***</sup>
Performance-approach (X3)			1.0	.15 <sup>**</sup>
Self-efficacy (X4)				1.0

<sup>NS</sup>Not Significant. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

The final objective was to determine the variance in self-efficacy explained by each goal orientation when controlling for the effects of the other two goal orientations. As shown in Table 4, mastery goal orientation explained the largest percentage of unique variance in self-efficacy (15.6%), followed by performance-avoidance (11.4%) and performance-approach (1.9%).

Table 4

*Partial and Squared-partial Correlations between Goal Orientations and Self-efficacy*

Goal orientation	Self -efficacy	
	$r_{a(b.c)}$	$r_{a(b.c)}^2$
Mastery	.39	.156
Performance-avoidance	.34	.114
Performance-approach	.14	.019

**Conclusions/Discussion**

The agriculture students in this study were similar to other agriculture students in regards to their goal orientations (DiBenedetto et al., 2016; Huff et al., 2016; Splan et al., 2011). Our positive correlations between self-efficacy and mastery were consistent with studies in agriculture (Huff et al., 2016) and other disciplines (Huang, 2016). Furthermore, this aligns with theory according to Elliot and Church (1997). Performance-avoidance had a negative association with self-efficacy, which was also congruent with prior research in agriculture (Huff et al., 2016) and Huang's (2016) meta-analysis. Our performance-approach results differed from Huff et al. (2016), but agreed with Huang.

Because students with different primary goal orientations possess different levels of self-efficacy, instructors may need to provide varying levels of challenge and support for students in each group. For example, instructors can provide scaffolding (Wood et al., 1976) to support all students, but especially those with a primary performance-avoidance goal orientation. Frequent, low-stakes assessments may additionally lessen the effects of performance-avoidance behaviors while supporting students with a primary performance-approach orientation without negatively impacting students with a primary mastery goal orientation. Assessing students' goal orientations can provide instructors with important information to enhance success for all students.

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**A TEN-YEAR VIEW OF GEORGIA AGRICULTURE  
TEACHER ATTRITION AND MOBILITY**

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Discipline Area: Post-Secondary Agricultural Education

## **Introduction, Purpose, Objectives**

This descriptive study tracked Georgia Agriculture Teacher attrition and mobility from 2009 - 2019. Agriculture Teacher numbers have been tracked nationally in the Agriculture Teacher Supply and Demand Study since 1965 and there has been an ongoing teacher shortage in agricultural education since 1917 (Hillison, 1987). All but two states have experienced a shortage of secondary agricultural teachers and the “Agriculture Teacher shortage” has been a consistent problem in secondary agricultural education for at least the last four decades (Kantrovich, 2010). Nationally there were 10,600 secondary agricultural education positions nationwide on September 1, 2009, with a net demand of 667 replacements, or 6.3% (Kantrovich, 2010). Determining where teachers go when they leave the profession is the first step to better understand their reason for their departure. This study used data from a ten-year span (2009 – 2019) containing every move of each Agriculture Teacher in the state of Georgia. The findings of this study align with Ingersoll and Smith (2003) who reported 42% of former teachers indicated a variety of personal reasons for leaving the profession. The rationale for this study is in support of the American Association for Agricultural Education’s (AAAE) National Research Agenda: Research Priority 3, “Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century” (Roberts, Harder, & Brashears, 2016).

## **Conceptual Framework**

The conceptual framework for this study is shaped by the Human Capital Theory as applied to education (Becker, 1993). This theory suggests that it is highly important to be aware of the attrition rate to inform decision makers of the profession. This is the primary factor driving this research for Georgia Agriculture Teachers. The Human capital theory divides teacher attrition factors into two categories: life-cycle factors and involuntary attrition. The involuntary attrition includes retirement, illness, death, and school uncertainty. The life cycle factors consider family conditions, location motivators, and the number of years teaching (Becker, 1993). Based on this framework the teacher attrition factors for this study were divided into the same categories of life-cycle factors and involuntary attrition. The study by Kirby and Grissmer (1993) to develop the Human Capital Theory studies the attrition rate over a number of years as opposed to the overall number of teachers leaving the classroom. The same idea is used in this study and the Georgia Agriculture Teacher attrition rate is tracked over the span of ten years.

## **Methods**

Data was collected by contacting Georgia Agricultural Education State Staff members, principals, superintendents, and current and past agricultural education teachers. The majority of the data was collected by conducting an interview with the Georgia agriculture education recruitment and retention specialists. These specialists tracked each position change that had occurred over a ten-year period. Primary effort was made to contact the former Agriculture Teacher directly if possible. After this, several other teachers were contacted directly, as well as other state staff members, to fill in any missing information on the remaining teachers. If the former Agriculture Teacher could not be reached then at least two data sources were used to triangulate and verify where teachers went after leaving the profession. There were 66 former

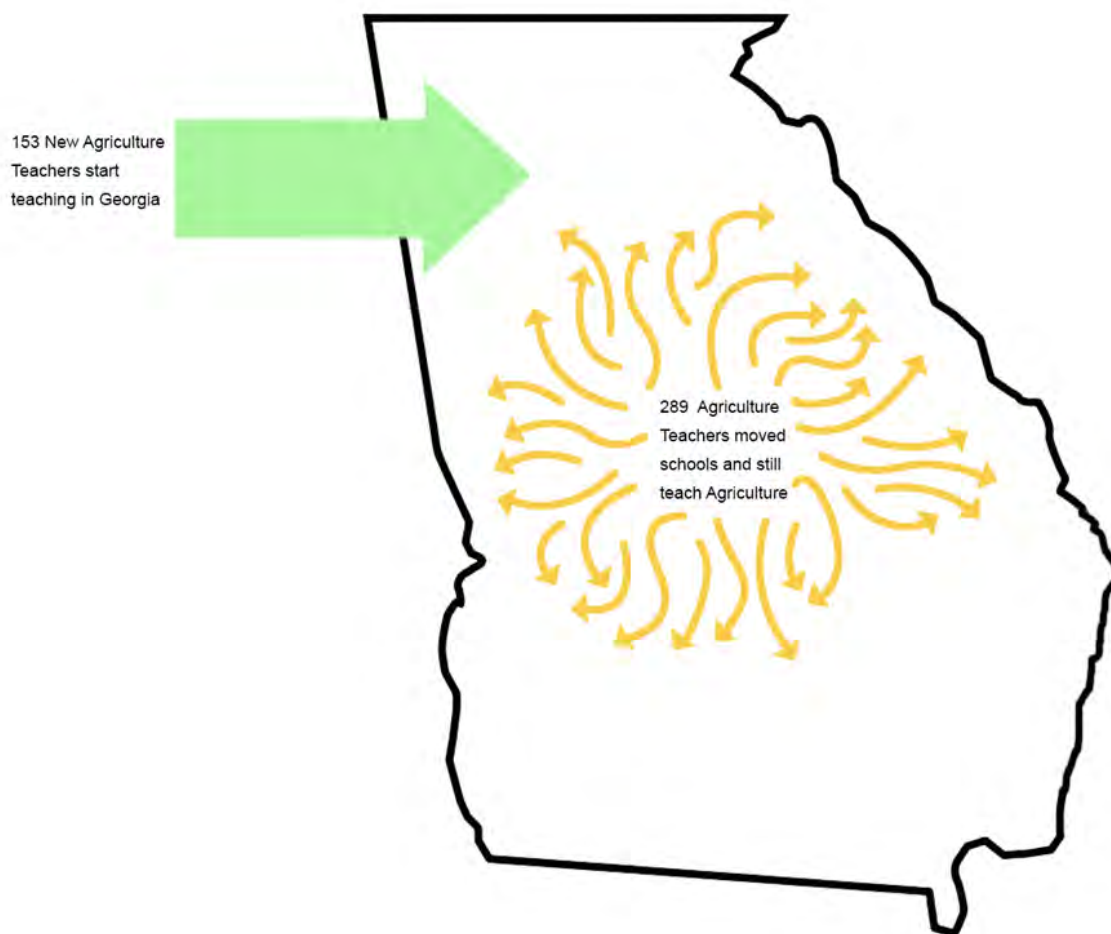
teachers that the researchers were not able to locate and/or find anyone who knew where they went. This information was graphed to show the attrition rate over the past ten years.

### Findings

During the ten-year span of this study 153 new Agriculture Teachers started teaching agriculture in Georgia either as graduates of Georgia teacher preparations programs, relocating to Georgia from out of state, or Georgia teachers who gained certification in agriculture. Additionally, during that same time, 289 existing Georgia Agriculture Teachers moved between Georgia schools and continued to teach agriculture. The influx of new teachers and movement of existing Georgia Agriculture Teachers is illustrated in Figure 1.

**Figure 1**

***New Agriculture Teachers and Existing Agriculture Teacher Movements between 2009 and 2019***



During the ten-year period of 2009-2019 there have been 586 Georgia agriculture teacher movements that were divided into two primary categories: “Changed Schools” (and are still teaching agriculture) (289); and “Left Teaching Agriculture” (297). There were 289 teachers that

moved from one agriculture teaching position to another within Georgia and remained agriculture teachers. The “Left Teaching Ag” (297) category was further divided into secondary categories of “Unable to Determine” (43), “Life-cycle Factors” (164) and “Involuntary Attrition” (90). The secondary categories were finally broken down to tertiary categories.

Of the 297 teachers that left the profession there were 43 teachers who left the profession whose destination after teaching agriculture is unknown. Efforts to locate these 43 individuals proved ineffective and researchers are unable to account for their whereabouts. Of the 297 teachers that left the profession, 164 had a Life-Cycle Factor for leaving the profession and 90 left due to Involuntary Attrition. Of the 164 that left due to Life-Cycle Factors: 61 went into industry, 32 chose to stay home, 25 taught a different subject, 16 became State Staff, 13 went to graduate school, 12 became administrators, 4 went to teach agriculture in another state, and 1 went into the military. Of the 90 that left due to Involuntary Attrition, 88 retired, 1 is deceased, and 1 is in jail. Data displayed in a Sankey Diagram in Figure 2.

# **Critical Issues Facing Georgia: An Application of the Delphi Technique and Community Capitals Framework**

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## **Introduction**

The 21<sup>st</sup> century has brought with it unforeseen challenges that will have a significant impact on the livelihood and well-being of Georgia residents (Abumhadi et al., 2012; Garforth, 2010). Globally, the issues of climate change (Weiskopf et al., 2020), population growth (Vollset et al., 2020), and the COVID-19 pandemic (Chakraborty & Maity, 2020) pose significant threats. Within the United States, farmers are threatened by economic insecurity, disruptions in trade networks, and fluctuations in demand (Gloy & Widmar, 2020; MSF Agriculture, 2020). These global and domestic trends will impact industries across Georgia (Suttles et al., 2018; Cammarano & Tian, 2018; Chin et al., 2020). Therefore, it is imperative for extension professionals and policy makers to identify which issues facing Georgia residents will be most critical.

The land-grant mission of the University of Georgia is underscored by a federal mandate to use university resources and personnel to benefit the citizens of Georgia (UGA Public Service and Outreach, n.d.). For over a century, the University of Georgia Cooperative Extension service has provided Georgians with academic research, timely information, and novel technologies (UGA Extension, n.d.). Thus, cooperative extension has a unique position of influence over residents in Georgia (Davis, 2016). One way that cooperative extension services can continue their mission is by identifying critical issues that indicate present and near-present challenges facing Georgia residents. For this study, we define a critical issue to be one with current or emerging matters of concern, which if unresolved, will have widespread, adverse effects on Georgia residents. Once identified, the issues can inform future programming and to direct extension resources towards the appropriate channels.

Extension is well adapted to responding and innovating in response to environmental changes and crises (Davis et al., 2021). As the 21<sup>st</sup> century progresses, the needs of urban and rural communities continue to evolve in response to changing stimuli (Narine & Meier, 2020). To remain faithful to mission mandated in the Smith-Lever Act and to meet the needs of a changing world, extension professionals must identify the current and emerging issues facing Georgia residents. Utilizing an expert panel of extension professionals, the present study seeks to identify these critical issues and generate consensus regarding which issues are most critical. Our framework for this study is grounded in the consensus building theory and the community capitals framework. The results of this study provide a framework for program development and resource allocation within Cooperative Extension and will make significant contributions to the state of Georgia through development of community resiliency.

## **Conceptual Framework**

## **Consensus Building Theory**

Generating consensus involves gathering individuals who represent varied interests and engage these individuals in a dialogue to address an area of shared concern (Innes & Booher, 1999). This practice is a common way to “search for feasible strategies to deal with uncertain, complex, and controversial planning and policy tasks” (Innes & Booher, 1999, p.412). The consequences of effective consensus building include high quality agreements between stakeholders who may otherwise not associate with one another, tangible products such as formal agreements and partnerships, and intangible products including social, intellectual, and political gains (Innes & Booher, 1999). Previous research supports the use of this method to identify and generate consensus among stakeholders regarding critical issues in their field (see Lamm, Randall, & Diez-Gonzalez, 2021; Lamm, Randall, & Fluharty, 2021; Connors, 1998). Overall, consensus building is “valuable from a societal perspective because it links the distributed intelligence of many players so they can form a more coherent and responsive planning system” (Innes & Booher, 1999, p.421).

## **Community Capitals Framework**

The community capitals framework has been used extensively in the social sciences discipline to analyze the complex interactions between human, social, political, and environmental systems (Emery & Flora, 2006; Flora & Flora, 2013) and make recommendations for community development initiatives (Anglin, 2015; Jones, 2021). Human capital consists of the natural and learned competencies of individuals and how these competencies are leveraged to increase resources in and outside of the community (Borron et al., 2019; Anglin, 2015). Some examples of human capital include educational and technical skills, leadership skills, work ethic, and lifestyle (Flora & Flora, 2013). Social capital refers to the connections between individuals and organizations in the community that enable collective action and foster change (Flora & Flora, 2013). Cultural capital is defined as what constitutes knowledge, how this knowledge is to be achieved, and how it is to be validated through the existing community power hierarchy (Flora & Flora, 2013; Anglin, 2015). Political capital represents a community’s capacity to transform societal norms, practices, and values into rules that govern distribution of community resources (Lamm, Borron et al., 2021). Natural capital refers to the “concentration of all environmental resources – renewable and non-renewable – within a community” (Lamm, Borron et al., 2021, p.289). Such resources include forestry, water, air and soil quality, weather, geography, and topography (Emery & Flora, 2006; Flora et al., 2016). Built capital consists of the infrastructure necessary to support the maintenance and development of community activities, including production, transportation, and power (Anglin, 2015; Flora & Flora, 2013). Financial capital refers to the economic resources accessible to a community for the development and support of wealth accumulation (Lamm, Borron et al., 2021). While not exclusively monetary, the resources in financial capital can all be translated to monetary instruments or converted into other forms of capital (Anglin, 2015).

## **Purpose and Research Objectives**

The purpose of this study is to identify and generate consensus regarding the critical issues facing Georgia residents. The study was driven by the following research objectives:



1. Create a comprehensive list of potential critical issues facing the citizens of Georgia;
2. Generate consensus on the most critical issues facing the citizens of Georgia;
3. Develop a heuristic thematic grouping of critical issues facing the citizens of Georgia.

## Methods

The Delphi technique was employed to generate consensus regarding critical issues facing Georgia residents. Nineteen individuals from the Georgia Extension leadership team, which included the Dean of Extension, associate deans, district extension directors, program development coordinators, and other administrative leaders, comprised the expert panel. Three rounds of the Delphi process were administered. The response rate for all three rounds was 100%. During the first round, panelists were asked to provide up to five responses, either a word or short phrase, to the following question: “In your opinion, what are the most critical issues facing the citizens of Georgia?” Items generated during round one were analyzed and duplicates were consolidated into single items. The resulting list of 63 unique issues were presented to panelists in round two.

During the second round, panelists were presented with the list of items generated during the first round of the Delphi process. Panelists were then asked to indicate the level of importance for each item using a five-point, Likert-type scale. Possible responses ranged from “1 – Not at all important” to “5 – Very important”. Following the second round, a mean level of importance was computed for each issue. A threshold value of 3.55 was determined *a priori*. Items with a mean level of importance lower than this threshold were not retained for further analysis. The resulting list consisted of 41 unique issues.

During round three, panelists were presented with the list of 41 issues retained from round two. Panelists were asked to indicate the level of consensus they associated with each issue by determining whether each issue should be retained. Panelists indicated whether an issue should be retained by using a dichotomous scale with possible responses “Yes” or “No”. Percentage scores were calculated to indicate the composite level of consensus associated with each item. A threshold value of 80% was determined *a priori* according to recommendations in the Delphi literature (Keeney et al., 2011). Items with a composite level of consensus lower than 80% were not retained for further analysis. Twenty-one issues were retained following round three of the Delphi process.

The final list generated from the Delphi process was analyzed using the constant comparative method (Glaser, 1965). Each issue was given an initial code, which were reviewed and compared in an iterative process to generate categories and eventually themes. The coding was initially completed by hand, using a manual, color-coded process, but was converted to a digital format using MS Excel. The themes resulting from the constant comparative analysis were examined to develop theories regarding the data and make appropriate recommendations.

## Results

The first round of the Delphi technique resulted in 63 unique responses related to critical issues facing Georgia residents. During round two, expert panelists rated the 63 unique issues generated during round one. Forty-one issues received a mean importance score of 3.55 or

higher. “Access to rural healthcare” and “rural job growth and availability” received the highest mean importance scores, while “student loan repayment” and “lack of teen jobs” received the lowest mean importance scores. The third round of the Delphi generated consensus regarding the 41 issues retained after round two. Twenty-one unique issues received a consensus level of 70% or higher. There were three items with unanimous consensus: 1) youth development, 2) youth leadership and development, and 3) career readiness and workforce preparedness.

The list of 21 unique issues generated during the Delphi process were analyzed using the constant comparative method. Table 1 displays the themes generated during this analysis as well as their associated items.

**Table 1.**

*Constant Comparative Method Thematic Analysis Results (n = 21)*

Categories	Number of Issues Overall	Number of Issues with 90-100% Agreement
<i>Investment in Youth and Adults</i>	5	4
Youth development		
Youth leadership development		
Career readiness and workforce preparedness		
Youth education		
Lack of workforce soft skills		
<i>Agricultural and Rural Economic Development</i>	3	2
Agricultural prosperity		
New technology for crop production		
Economic development in rural GA		
<i>Agriculture and Food System Information</i>	2	2
False information of food issues (i.e., GMO understanding) leads to incorrect food choices		
Limited understanding of the importance of agriculture and where food comes from		
<i>Resource Access and Availability</i>	6	4
Water quality		
Limited access to healthy food choices		
Limited access to fresh food choices		
Access to resources in rural areas		
Water quantity		
Fair water distribution for agriculture		
<i>Social and Personal Economic Concerns</i>	5	0
Lack of civic and community leadership capacity at all stages of the life cycle		
Financial wellbeing and income		
Financial literacy and management		
Family stability		
Aging population		

## Conclusions, Recommendations, and Implications

Thematic analysis of the 21 issues from the Delphi technique resulted in the identification of five major themes encompassing the critical issues facing Georgia residents. These heuristic categories offer enhanced insight into expert feedback from industry professionals and provide a starting point for action. The dimensions of the *Investment in Youth and Adults* theme highlight the need for increased education, workforce preparation, and leadership development. Within the *Agricultural and Rural Economic Development* theme, the associated issues underscore the importance of agriculture in Georgia's economy and future economic development. The issues identified in the *Agriculture and Food Safety Information* theme highlight the need for increased awareness regarding new agricultural innovations and the value of Georgia's agricultural industries. *Resource Access and Availability* relate to the threats facing water use in Georgia and the implications of food insecurity. Finally, *Social and Personal Economic Concerns* delineate gaps in general financial knowledge, lack of societal role models, and the impacts of changing demographic characteristics.

The community capitals framework is a useful lens that we have included to provide a more heuristic classification of the issues identified during the consensus building process. Analysis through the lens of community capitals enables us to determine how the critical issues identified in this study relate to the capital stock within Georgia communities. This framework provides a holistic view of the human and material resources available to Georgia communities, enabling extension practitioners to direct resources more efficiently and develop programming that addresses the most pressing community needs. Each of the critical issues generated by the Delphi process correspond to one or more community capitals. The interaction between human, political, and social capitals are apparent within *Investment in Youth and Adults*. Financial, built, natural, and political capitals overlap within *Resource Access and Availability*. Regarding *Agricultural and Rural Economic Development*, the identified issues underscore the relationships between financial, built, human, and natural capitals. Natural and cultural capitals describe the issues associated with *Agriculture and Food System Information*. Finally, issues within the *Social and Economic Concerns* theme highlight the intersection of cultural, political, social, financial, human, and built capitals.

Since extension possesses limited financial and human resources, it is imperative that immediate efforts be directed towards issues that generated the most agreement from experts. Issues with 90-100% agreement in round three were identified as top issues. Twelve critical issues were designated as top issues. Based on this data, primary efforts should be directed towards addressing issues highlighted associated with *Resource Access and Availability* (4 issues in top 12) and *Investment in Youth and Adults* (4 issues in top 12) followed by *Agricultural and Rural Economic Development* (2 issues in top 12) and *Agriculture and Food Safety Information* (2 issues in top 12). Although the critical issues in the *Social and Personal Economic Concerns* theme are important, none of these issues were in the top 12 issues; therefore, addressing these issues is not an immediate priority.

One noteworthy finding is the three issues with unanimous agreement from expert panelists are all associated with the *Investment in Youth and Adults* theme. Human capital

represents a critical resource within Georgia. Future economic development in suburban and rural areas depends on the maximization of human resources. However, the issues identified within the *Investment in Youth and Adults* theme illustrate a grave theme. Although the state of Georgia has potential in the number of individuals able to enter the workforce, the existing education and career preparation is insufficient. In particular, youth leadership development and career preparation programs represent two areas with the greatest need. Within these issues, there is an intersection of human, political, and social capitals. Human capital is the output of these programs but is influenced by confounding social and political factors. It necessary to examine how these social and political factors help or hinder in the development of competent, skilled workers. In practice, we recommend that extension professionals identify the barriers to involvement in youth leadership development programs as well as the barriers prohibiting career readiness in adults. For instance, what social factors within these communities promote success? Are there political factors, i.e., legislation or power dynamics, that prohibit upward mobility? A comprehensive understanding of the factors that influence flow of human capital is vital to address these issues. Extension must be committed to directly enhancing the lives of Georgia citizens by examining these factors and using this information to develop appropriate leadership and career development programming.

Within the Delphi process, there are inherent limitations which may restrict the generalizability of results. For instance, the scope of the identified issues is inherently limited by the insights and perspectives of the expert panelists. Although measures were taken to reduce bias and assemble a heterogenous panel, we recognize that the expert panelists' perspectives and personal characteristics may have influenced the results. Additionally, the primary coder of the data is from a suburban community in the Southeastern United States and has previously worked with extension and community development initiatives. These personal experiences may have influenced their interpretation of the data. Measures to reduce bias, such as member checking, were employed according to recommendations in the literature (Lincoln & Guba, 1985).

The aim of this article is to facilitate the continued development of the state of Georgia by identifying and generating consensus around the most critical issues facing the state's residents. The results of this study carry significant implications for practice, primarily by providing the Georgia Cooperative Extension Service with a guideline for program development and resource allocation over the next five to ten years. The use of the Delphi technique in conjunction with the community capitals framework enables valuable comparison with the existing strengths and capitals within Georgia communities. Knowledge of these capitals and their interactions with one another allows for greater efficiency in addressing these issues. While the results of this study may not be directly applicable to all states in the southeastern United States, they should serve as a foundation for strategic entry points within Georgia communities and be used to guide the efforts of Extension services over the next decade.

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**Qualitative Analysis of South Carolina 4-H Programming during COVID-19 Pandemic**

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North Carolina State University

### **Qualitative Analysis of South Carolina 4-H Programming during COVID-19 Pandemic**

#### **Introduction, Purpose and Objectives**

Cooperative Extension Services across the United States serve their respective states by offering unbiased, research-based education to audiences young and old (Monks et al., 2017). They serve as the essential connection between the university and the public across the state, requiring them to be adaptable to the needs of their constituents (Cooper & Graham, 2001). “In the last decade, Cooperative Extension has rapidly diversified its portfolio in many ways to respond to the needs of people in our rapidly changing society, including adapting to online learning environments and ‘the cloud’” (Gould et al., 2014, para. 7). One of the most important needs to date was navigating through the COVID-19 Pandemic.

Since the COVID-19 Pandemic shut down schools, educators and parents were not prepared to quickly provide hands-on learning opportunities to complete at home (Loose & Ryan, 2020). Cooperative Extension services nationwide quickly took to the Internet to create virtual solutions and alternatives to offset the lack of in-person programming (Arnold & Rennekamp, 2020). “In our rapidly changing environment, Cooperative Extension has to maintain contemporary relevance and documented impact across the broad spectrum of our programming efforts” (Gould et al., 2014, para. 11), but how can this be accomplished during a pandemic? The pandemic created unique challenges for all 4-H program team members which required motivation, both intrinsic and extrinsic (Calvert & Fabregas Janeiro, 2020), to overcome the obstacles presented.

Before COVID-19-related closures, 4-H groups and clubs were led by volunteers or 4-H staff and met in various locations, at varying times to engage, study and practice, or for fellowship and celebration (Burnett et al., 2000). Scott et al. (1990) described that parental encouragement was a highly significant factor influencing project completion. Non-parental adults (McNeill, 2010) helped distribute 4-H programming opportunities to youth via virtual platforms and take-home kits once Extension Offices closed due to the Pandemic. Grégoire (2004) noted dedicated staff and volunteers of 4-H programs aided in evolving and adjusting to the changing needs.

These programming opportunities were meant to aid in at-home learning with hands-on activities that, in most cases, were aligned with school standards and to promote Positive Youth Development (PYD), which suggests that all attempts should be made to match youth strengths and context of positive youth outcomes (Agans, 2014). It is no secret that COVID-19 impacted PYD, including a range of impacts from trauma, isolation, and the loss of relationships to daily routines and social outlets to name a few (Arnold & Rennekamp, 2020). With the knowledge of these impacts, Extension professionals strive to remain “consistent with [the] mission of positive youth development, [as] the 4-H program is uniquely positioned to address and mitigate COVID-19 impacts on youths by focusing on building youth assets and providing supportive contexts” (Arnold & Rennekamp, 2020, para. 10).

It has been recommended that additional research is essential to gather feedback from parents and members on their perceptions of their own states’ programming efforts during the COVID-19 Pandemic. Therefore, the purpose of this study and the overarching research question was to identify the perceptions of participants and their parent/guardian related to the virtual 4-H



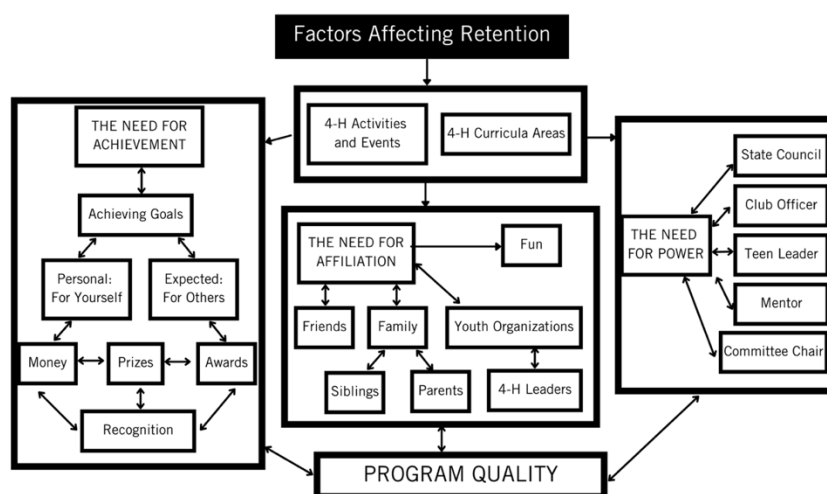
programming opportunities available to youth in South Carolina during the COVID-19 pandemic.

### Theoretical/Conceptual Framework

McClelland's (1987) Need for Achievement Theory undergirded this study. The theory of motivation (McClelland, 1987) is associated with learning concepts, where needs are learned through coping environments (Pardee, 1990). Figure 1 outlines the three factors (i.e., need for achievement, need for affiliation, and need for power) associated with the theory of motivation (Gill et al., 2010). "McClelland's (1987) theory is seen in 4-H studies relating to member retention (Gill et al., 2010) and participation" (Baney & Jones, 2013). Based on previous use of the theory, it is only fitting that it is implemented within this study examining 4-H member participation, perceptions, and motivation during the COVID-19 pandemic.

**Figure 1**

*Conceptual Framework of Factors Affecting Retention, Based on McClelland's Motivational Needs Theory (Gill et al., 2010)*



### Methods

This qualitative research was implemented using a focus group design to further evaluate the impact of the COVID-19 pandemic on 4-H youth in South Carolina. Upon reviewing the existing data from the surveys, and the obvious nonresponse bias, another approach was needed to understand the perceptions of youth and parents who participated in South Carolina 4-H virtual programs. The research team constructed a qualitative interview protocol, consisting of a series of seven overarching questions and talking points to discuss with participants (see Figure 2).

**Figure 2**

*Qualitative Interview Protocol*

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1. Tell me about yourself.
    - a. Age
    - b. Where you live
    - c. Hobbies
    - d. Favorite candy
  2. Are you a current 4-H member?
    - a. Yes, tell me about your involvement and where.
    - b. No, why?
      - i. Were you ever a member?
        1. What made you not rejoin?
      - ii. Ask me how to become a member!
  3. Did you participate in any of the 4-H opportunities that were made available during the COVID-19 pandemic?
    - a. If yes, which ones?
    - b. If no, why didn't you participate?
      - i. If answer is "I don't know" or "just because" follow up with:
        1. Was money a factor?
        2. Lack of appropriate resources?
        3. Technology or lack thereof?
  4. How often do you participate in 4-H activities when there is not a world-wide pandemic?
    - a. Follow up with asking how many activities (or for a range) in which they participated.
    - b. If they said none, follow up with why?
      - i. Money?
      - ii. Transportation?
      - iii. No interest?
  5. Do you feel virtual and at-home SC 4-H programs were appropriate for all of the audiences (K-12 students and the adults assisting)?
    - a. If yes, what did you find to be the best feature?
    - b. If no, how could the lessons/activities/programs have been made better?
  6. If you are an active 4-H member/parent of 4-H member, tell me about the volunteer/leader you are most involved with.
    - a. Do you like them?
    - b. Do they do a good job as the leader?
    - c. If you do not particularly like your leader, why not?
  7. Is there anything else you'd like to tell me?
- Thank you for taking time to talk with me today. You are helping me learn more about the impact of 4-H programming provided in SC during the COVID-19 pandemic. |*

The interview protocol was evaluated for face and content validity (Salkind, 2012) by three faculty members in agricultural and extension education across two universities. The interviews were conducted with four families (four adults, seven children; [ $n = 11$ ]) across South Carolina via Zoom. Zoom provided a virtual meeting platform for the research team to interview the families individually, while also allowing for the interviews to be recorded and interview transcripts to be developed through the platform. After the focus group interviews, the research team analyzed the data using the constant comparative method (Glasser & Strauss, 1967). The research team used the Zoom interviews, interview transcripts, and interviewer notes to triangulate the data, allowing codes, themes, and categories emerge (Glesne, 2016). The constant comparative method allows the data, including the participants voice, to speak for itself (Glasser & Strauss, 1967). Three rounds of coding were implemented starting with open-source coding. The codes from the first round were then analyzed using axial coding, where the relationships of codes were used to establish categories (Creswell & Poth, 2018; Glasser & Strauss, 1967). The final round implemented selective coding, allowing the overarching themes to emerge as core themes and variables.

Palaganas et al. (2017) suggests that researchers acknowledge their inherent bias related to their study and disclose their identity to offer reflexivity. The research team for this study consisted of a graduate student in agricultural education, who is also an active 4-H youth development educator, along with three faculty members in agricultural and extension education at Clemson University and North Carolina State University. The graduate student has worked in Extension

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for eight years and is currently completing a degree in agricultural education at Clemson University. The three faculty members have more than 40 years of experience combined in agricultural and extension education. Overall, the research team recognizes their bias toward Extension because of their professional roles and feels they have overcome the bias through the established trustworthiness of the study.

### Findings

The focus group interviews were analyzed, allowing codes, themes, and categories to emerge related to the youth and parents' perceptions of the virtual 4-H programming offered during the COVID-19 pandemic. The codes and themes resulted in two overarching categories, including communication and 4-H agent/volunteer leader impact.

The first theme found throughout the interviews was communication. Communication was then divided into two parts: pre-COVID-19 and during-COVID-19. Family #1 [mom] mentioned they have been impressed with the level of communication and the amount of programming offered. They said that it seemed like there were more newsletters sent out and that there was more information within those newsletters compared to before COVID-19. Family #2 [the parents] detailed how there has been little to no communication on the county level. The few details they had about 4-H activities they found on their own through the state social media pages or the state 4-H website. Family #2 commented that it was not just their local agent not communicating, but they also never got any information from their local club's volunteer leader. The family also commented that they had just recruited a new family to join their local group, so it was especially frustrating that this new family joined and received zero information. Family #3 [mom] complimented the marketing strategies and graphics used for marketing throughout the COVID-19 Pandemic. Upon seeing a 'random Facebook ad' for South Carolina 4-H@Home, Family #3's mom signed up to begin receiving the daily emails. Family #4 commented that their 4-H Agent does a "good job" of communicating.

The second theme of the interviews was 4-H Agent/Volunteer leader impact. All four families had something to say regarding the leadership within the county they participate. 4-H Agent/Volunteer leader impact can further be divided into positive and negative impacts. Family #1 describes the positive impact of their local 4-H Agent, "our local agent is so gifted in matching the child with what will both be interesting to them and what will grow them and push them just a little bit at just the right time." Family #1's mom went on to compliment the other local agents the family works with, as well as the state staff. Family #2's parents described the negative impact of their local 4-H Agent/Volunteer leader in that there was an issue with the local organization before COVID-19 closures, but it seemed to be "explained away enough" and that they would let it slide after eventual communication. Family #2's parents also mentioned that because they were not "on the same standing as others" because they were not originally from their county, like their local leadership. Family #3's mom said due to their participation in 4-H@Home, they were able to connect with their local agent. She said it was the best thing they could have done because the local agent is "wonderful." Family #3's local agent was complimented on their skills to work with younger children and that they are so welcoming. Family #4's 4-H member wrote they like working with their local agent and that they do a "good job." Family #4's 4-H member also does a lot of projects that are in the same wheelhouse as the 4-H agent.

### **Conclusion/Discussion/Implications/Recommendations**

“Virtual Programming did not eliminate the need for a local connection - it only highlighted the importance of a local connection who was a broker of education among: (a) networked programs, (b) local audiences, and (c) the land-grant institution” (J. L. Donaldson, personal communication, July 6, 2021). After reviewing the transcripts and recordings of the focus group interviews, two common themes arose: communication and 4-H Agent/Volunteer leader impact. Each family had a comment or opinion of a statement regarding how they heard of the opportunities with South Carolina 4-H during the COVID-19 Pandemic or about the 4-H Agent and Volunteer leaders in the county. Each theme could be divided into two parts. Communication was seen as a “pre-COVID-19 Pandemic” and “during-COVID-19 Pandemic” talking point. 4-H Agent and Volunteer leader impact was described in both positive and negative ways.

The theme of communication was described positively and negatively. Families appreciated the more frequent and detailed communication from county programs, as well as the improved marketing efforts. Not all counties received the same communication efforts, however. Some families recalled not knowing if 4-H even existed in their county or South Carolina. Communication is one of the most important skills within Cooperative Extension, especially 4-H.

Another theme from this study was 4-H Agent and Volunteer impact. Families interviewed were asked about their relationship with the local 4-H Agent or Volunteer they worked with the most. Families #1, 3, and 4 described a positive relationship and praised their agent. Family #2 stated they have been working with a local volunteer and their 4-H Agent, and ever since COVID-19 pandemic closures, the impacts have been negative. From these interviews, it is clear that 4-H Agents and Volunteers can make or break the decision to join or re-enroll in a county program.

While it is easy to point fingers and blame the county 4-H Agents on not communicating or offering programs during COVID-19-related closures, it can also be challenging to make those judgements without all of the background information as to why the agent/leader may have been absent. Israel et al. (2020) described how COVID-19 affected Extension Agents with having to manage work-life balance with many interruptions that could have affected programming efforts and communication with clientele. Extension Agents and Volunteers could have been dealing with the virus themselves or caring for an infected family member, caring for an elderly parent or family member, or simply not had the resources to conduct regular work while quarantined at home.

In addition to frequent and timely communication with clients, South Carolina 4-H Agents, Educators, Specialists, and Volunteers need to recognize their influence on a family choosing to join or re-enroll in 4-H programs. If the 4-H Agents are not offering a variety of programs within the county, potential families will look to neighboring counties for membership or lose interest altogether. Communication style by agents is also a contributing factor to joining or re-enrolling county 4-H programs. If the agent fails to communicate or leads the family to believe they are a bother to talk to, then those families will not want anything to do with 4-H.

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State 4-H Leaders are not only recommended but highly encouraged, to create a best practices list for virtual 4-H programming. If there is not a contact or list at the state-level to aid county-level staff, then some people, especially inexperienced staff, do not know who to turn to for answers. Table 1 outlines best practices to guide county, and local agents/volunteers communicate with their clientele.

**Table 1**

*Best Practices for 4-H Agents, Educators, Specialists, and Volunteers in Virtual Programming*

Best Practice
Establish a method of communication with county participants.
Create a contact list of people on the local, regional, and state levels who can give you more information on the virtual program.
Advertise programs via online, hardcopy, television, or radio media.
Establish if 4-H participants will need to print materials used in virtual program.
Complete midway and end of the program check-ins on the participants.
Offer to schedule visits with participants to stay updated on them throughout the program year.
Future research should be explored using more families for interviews to gain a better understanding of 4-H leader impact. It is also recommended that in-person focus groups are held, with the option of virtual meetings via Zoom. Based on the interviews conducted, it was evident the parents dominated the conversations. It almost seemed like the parents were vicariously giving accounts for the children. Based on this knowledge, it would be recommended that the interviews be split into a conversation with parents only and a separate conversation with just youth. Additionally, the questions and topics discussed within future research should be expanded on to include use of the life skills learned in 4-H among 4-H members.
Overall, the majority of families interviewed for this study were pleased with their 4-H Agent and Volunteer's impact and levels of communication during and post-COVID-19. There is room for improvement in both themes. 4-H Agents and Volunteers should continuously work on ways to improve their communication and teaching styles. These same caring adult leaders should strive to "make the best better" even with themselves. Clemson University Extension strives to make its clientele and audiences lifelong learners and makes the same efforts towards its employees by giving them the resources to improve.

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**To Stay or To Leave:  
Job Embeddedness among Cooperative Extension Agents**

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## **To Stay or To Leave: Job Embeddedness among Cooperative Extension Agents**

### **Introduction**

The Cooperative Extension Service (CES) has had a long-standing problem with the retention of its county extension agents (CEAs) (Strong & Harder, 2009), who are responsible for delivering educational programming in more than 3,000 counties in the United States (Franz & Towson, 2008). When CEAs leave their position in a county—voluntarily or involuntarily—it results in “disrupted educational programs, unmet citizen needs, low morale among remaining Extension professionals, and wasted financial and material resources dedicated to Extension agent on-boarding and in-service training” (Safrit & Owen, 2010, p. 2). Also, agents who have remained after other CEAs have left the organization reported decreased quality of programs, job satisfaction, productivity, and a further loss of CEAs (Burnett et al., 2000). According to Vines et al. (2018), when agents leave, the programs created to fulfill the needs of the community members are put on hold (Vines et al., 2018). CEA turnover can also be an economically costly problem because of the expense of recruiting and hiring replacements (Kutilek, 2000). Most studies on agent retention have focused on turnover and why CEAs leave a position to identify ways an organization can correct the environment to prevent leaving. However, the Job Embeddedness (JE) Theory seeks to explain why employees stay rather than why they leave a company (Mitchell et al., 2001). The theory explains how JE correlates with the likelihood of an CEA staying with the organization. According to Arkansas extension education researcher Donna Graham, retention is a significant problem in the Arkansas CES (personal communication, September 14, 2020) that could be illuminated by examination through the lens of JET.

### ***Purpose***

The purpose of this research was to identify the levels of JE among Arkansas CEAs to try and better understand why CEAs stay in their positions. The findings should guide Arkansas CES administrators as they work to increase embeddedness through retention activities, which can be targeted to employees belonging to specific demographic groups, according to their specific needs as identified through the lens of JET. This research effort was guided by the following objectives:

### ***Objectives***

1. Describe selected demographics of Arkansas County extension agents.
2. Describe the level of job embeddedness across all job embeddedness dimensions.

### **Theoretical Framework**

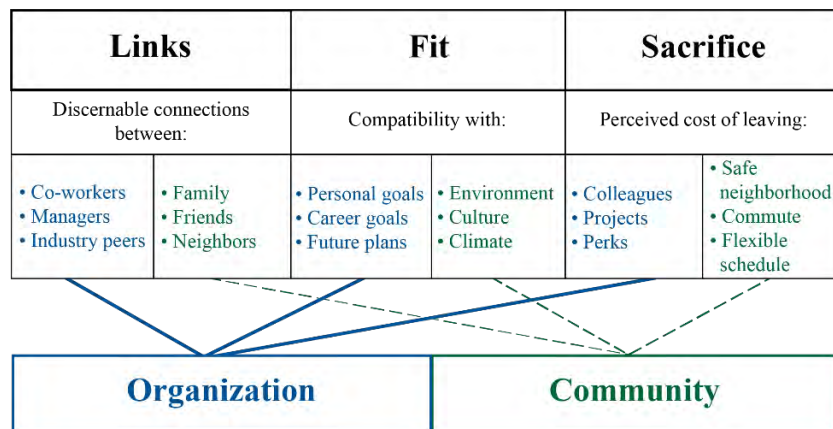
Mitchell et al. (2001) proposed a new construct to help explain and improve employee retention, called Job Embeddedness Theory. This construct flipped the perspective on employee retention, which previously focused on why employees left companies, while JE focused on why employees stay. According to Mitchell et al. (2001), the previous literature 16 stemmed primarily from March and Simon (1958), who wrote about the “perceived ease and desirability of leaving one’s job” (Mitchell et al., 2001, p. 1102). Holtom et al. (2006) said recent literature had been

more focused on why employees leave, and relatively little research on employee turnover had concentrated on describing the factors that determine whether an employee will remain in an organization. Mitchell et al. (2001) described why one would *stay* at their current job, focusing on the employee's links, fit, and sacrifices. In the JET Model (Figure 1), these three characteristics explain why employees stay in their current jobs, and how each characteristic can be viewed through its connection to the employee's organization and community.

Broadly defined, links are the discernable connections between a person and their organization and community. These links can be formal (official) connections between a person and institutions or other people, and informal connections to the same or different institutions/people. JET proposes that each person has several strands which connect them (along with their family) in a web of social, psychological, and financial threads. This web includes work and non-work friends, groups the person—and/or their family—is involved in, and the community and the physical environment where they live. Ableson (1987) found that there were multiple factors associated with an employee's intent to stay, including satisfaction and commitment, that were related to voluntary turnover.

**Figure 1**

*Job Embeddedness Theory Model*



*Note.* Solid arrows connect examples of links, fit, and sacrifice to the organization, while dashed arrows connect examples of links, fit, and sacrifice to the community.

Fit is the employee's perception of their compatibility with their organization and community, like organizational culture values and desires to create interpersonal relationships in the community may contribute to retention rates (Mears, 2017; Sheridan, 1992). Organizations and communities have unique demands, goals, and values that individuals must consider how well their personal values, goals, and plans fit into. O'Reilly et al. (1991) stated that "'misfits' terminated slightly faster than 'fits'" (p. 1104), and research concluded that when poor person organizational fit occurs as a result of poor organizational entry, employees were more likely to leave (Cable & Parsons, 1999; Chatman, 1991).

If an individual were to leave the job or community, there would be certain tangible and intangible benefits that they would sacrifice to leave. These benefits are proposed to further embed individuals into their organization and community by the individual being unwilling to give the benefits up (Shaw et al., 1998). These benefits may make it difficult for employees to leave if asked to sacrifice those benefits include salary, health care, stock options, pension plans, job stability, and job advancement opportunities (Gupta & Jenkins, 1980; Shaw et al., 1998). Potential benefits from an individual's community include safe and attractive neighborhoods, giving up tickets or seats to their favorite sport that took many years to receive, and quick or easy commutes (Mitchell et al., 2001).

### Methods

The subjects of this census study included all Arkansas CEAs, as qualified by the job title of County Extension Agent, who were employed by the University of Arkansas Division of Agriculture. A quantitative survey instrument was designed by the researcher. It was a close adaptation of the JE instrument previously developed by Mitchell et al. (2001), with only slight wording changes to fit the context of this study. The instrument included 40-question Likert-type questions, and it was administered through Qualtrics. All items, other than the fill-in-the-blank questions (questions 1-3 of links: community and questions 1-3 of links: organization), were evaluated on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).

To determine the validity of the instrument among extension agents, 14 extension agents from 11 states other than Arkansas participated in a pilot test. Minor semantic changes were made to 13 questions to clarify the purpose of the question or tailor the wording toward CEAs. The instrument was based primarily on Mitchell's (2001) instrument with only minor semantic changes to fit the context of the subjects. Mitchell reported a Chronbach's alpha of .87 for the instrument.

Descriptive statistics were analyzed using the latest version of SAS software available. Mean scores and standard deviations were calculated for all demographic questions and JE dimensions. The overall level of JE was also calculated for each demographic characteristic. The overall JE mean and the mean of each JE dimension were then compared across each demographic level.

### Results

There were 197 employees employed by the University of Arkansas who fit the criteria. A total of 162 surveys were completed, resulting in an 83% response rate. The first objective that guided this study was to describe the selected demographics of Arkansas CEAs. The selected demographics were age, gender, length of time employed in the current county, and the approximate population of the county (or counties) currently employed.

The second research objective was focused on describing the mean scores of each JE dimension and each item within the survey instrument. To support this objective, the mean score was calculated for each dimension of job embeddedness (fit: community; fit: organization; links:

community; links: organization; sacrifice: community; and sacrifice: organization) as well as the Overall Job Embeddedness Score (OJES).

***Research Objective 1: Describe Selected Demographics of Arkansas County Extension Agents***

Majority of CEAs were between the ages of 20 and 49, while the largest age group was between 50 and 59 years old ( $n = 37$ ). Majority of agents were female ( $n=96$ ) in portion to male agents ( $n=59$ ). Most agents had been employed in their current county for five years or less ( $n = 73$ ), while one agent reported having been in their current county for 31 years or more ( $n = 1$ ). Many participants reported being employed in a county (or counties) with a population of 20,001 to 50,001 people ( $n = 38$ ).

***Research Objective 2: Describe the Level of Job Embeddedness across all Dimensions and the Relationships between Arkansas County Extension Agent Demographics and Job Embeddedness Dimensions***

The overall JE score of 3.61 indicates a medium risk of turnover among Arkansas CEAs. Employees with an overall JE score of 4 or lower (out of a 5-point Likert-type scale) are at risk of voluntarily leaving an organization if suitable opportunities presented themselves to employees (Mitchell et al., 2001). The dimensions of JE with the highest overall mean scores, and therefore the areas where agents likely feel supported by administrators, were *fit: community* ( $M = 4.25$ ;  $SD=.73$ ), *fit: organization* ( $M = 4.28$ ;  $SD=.65$ ), and *sacrifice: community* ( $M = 4.21$ ;  $SD=.64$ ). The JE dimensions with the lowest mean scores were *links: organization* ( $M = 1.81$ ;  $SD=.61$ ), followed by *links: community* ( $M = 3.23$ ;  $SD=.68$ ), and *sacrifice: organization* ( $M = 3.96$ ;  $SD=.65$ ).

Age was a key factor in JE levels, as the overall JE score (OJES) rose progressively among agents 20-29 years ( $M = 3.36$ ;  $SD=.40$ ) to those 60-69 years old ( $M = 3.89$ ;  $SD=.26$ ). The correlation between age and OJES was significant at the ( $p < .001$ ) level.

There was a negative correlation between gender and OJES at the ( $p < .01$ ) level, as the males ( $M = 3.75$ ;  $SD=.34$ ) had a higher mean score than females ( $M = 3.53$ ;  $SD=.48$ ). This trend continued through every JE dimension, where the mean score for males was consistently higher than for females. Although females ( $n = 95$ ) were more numerous than males ( $n = 55$ ).

The length of time that a CEA within Arkansas spent in their county had a significant relationship with their OJES at the ( $p < .001$ ) level. OJES consistently increased from those who had spent five years or less in their county ( $M = 3.44$ ;  $SD=.45$ ) to a single respondent whose length of service was 31 years or more ( $M = 4.18$ ). However, there was a decrease in those employed in a county for 11 to 15 years ( $M = 3.53$ ;  $SD=.47$ ), as compared to six to 10 years ( $M = 3.77$ ), but the OJES then rose again after 16 years ( $M = 3.75$ ;  $SD=.30$ ).

**Conclusions**

Understanding the demographic characteristics of the population of Arkansas CEAs was paramount to creating a deeper understanding of JE. Gender, age, and length of time in a county

were especially key factors. The study found that Arkansas CEAs had a medium-high overall mean JE score ( $M=3.61$ ;  $SD=.44$ ), which, based on the JET theoretical constructs, resulted from their relatively high levels of fit within their community and organization, the relatively high levels of acknowledgment of what they would have to sacrifice if they left their job, along with the relatively low amount of links within their community and organization.

The majority of Arkansas CEAs were less than 49 years old, female, and had spent 10 years or fewer in their county. Male agents, who were in the minority, were more embedded in their job than their female counterparts. The research on the relationship between gender and JE or job satisfaction was unclear on its effectiveness as a predictor of job satisfaction among Extension faculty (Nestor & Leary, 2000). All of these demographic characteristics are connected in the literature with an increase in an employee's likelihood of experiencing burnout, a decrease in job and life satisfaction, and an increase in stress levels (Fetsch & Kennington, 1997). Despite the high number of female CEAs, male CEAs had a consistently higher JE score across all dimensions. Of concern was the low number of links within the organization and the decrease in JE scores after approximately 10 years in the same county.

Age was an especially important characteristic in examining JE. Over time, agents become more embedded in their job, which coincides with findings on job satisfaction's relationship with age (Ableson, 1987; Bowen et al., 1994; Bedeian, 1992; Long & Swartzel, 2007; Nestor & Leary, 2000). Age and the length of time an agent had spent in their current county had significant relationships with five of the six JE dimensions and OJES, excluding *links: community*. In each statistically significant relationship, as age and length of time increased, JE also increased. Younger agents and newly placed agents need more support and training on how to build relationships in and around Extension to decrease feelings of burnout and low satisfaction with life and to increase the number of relationships that an agent can utilize in their day-to-day responsibilities (Fetsch & Kennington, 1997; Herzberg et al., 1959).

OJES consistently increased as time spent in a county increased, except for during one mid-career time span. One factor that has been noted in the literature as significant predictor of job satisfaction is the length of time an employee has spent in an organization, where fewer years spent in a county was associated with lower overall life satisfaction and building up community respect over an extended period was a significant motivator for continued employment with Extension (Arnold & Place, 2010a; Bedeian et al., 1992; Bertz & Judge, 1994; Boltes et al., 1995; Bowen et al., 1994; Fetsch & Kennington, 1997). Herzberg et al. (1957), long ago noted that employees typically had high levels of job satisfaction at the beginning of their early 20s, then decreased over time, particularly between their late 20s and early 30s, when job satisfaction began to rise again steadily until the end of their careers. Staying put in one county for an extended period had a high correlation with the level of embeddedness in Arkansas CEAs, even if that feeling drops for some time mid-career.

The JE dimensions of *fit: community*, *fit: organization*, and *sacrifice: community* represented areas where the CEAs appeared content with their situations at work. The JE dimensions with the lowest mean scores were *links: organization*, *links: community*, and *sacrifice: organization*. These are the three areas where agents require more support from administration and each other (Arnold & Place, 2010a; Church & Pals, 1982; Safrit & Owen, 2010; Smith et al., 2011; Vines et

al., 2018). *The links: organization* score was much lower than any other dimension, a result that is consistent with Young (2012), where both *links: community* and *links: organization* exhibited lower scores than any other dimension.

Additionally, the CEAs appeared to have relatively low mean scores related to links across demographics. Agents need support to increase the number and strength of interpersonal relationships between agents in their county office, in their district, and within their state (Safrit & Owen, 2010). Ensle (2005) found that, at the national level and across several decades, Extension systems do not provide help or support directly to county agents at the level county agents expressed a wish for, leading to burnout and increased turnover, so this has been a focus of concern in the literature for many years.

### **Implications and Recommendations**

Agents should not feel like islands within their counties but should feel linked to their colleagues statewide and be comfortable collaborating with them (Arnold & Place, 2010a; Herzberg et al., 1959; Young et al., 2013). The effort to create these links should begin with the onboarding process, where new agents are encouraged to build relationships with other new agents and with more experienced agents, and should be made aware of the opportunities to build those relationships (Arnold & Place, 2010a; Safrit & Owen, 2010; Smith et al., 2011; Vines et al., 2018; Young et al., 2013). Research supports the use of mentorship systems as well (Arnold & Place, 2010a; Blacklaw-Freel, 2020; Eastman & Williams, 1993; Kutilek & Earnest, 2001).

Three demographic categories indicated the highest risk of experiencing low JE in this study. Support from Arkansas CES needs to improve for them to feel embedded in the organization and their communities. Agents who are new to a county, who are 39 years old or younger, and female agents are all at a higher risk of leaving due to potential low JE. This support may come in the form of the following recommendations from Mowbray (2001, p. 142) and others cited below:

- Examine and implement new ways to shift workloads or share them, including shared positions, flexible work time, and compensatory time.
- Keep starting salaries and pay raises competitive with similar jobs (Herzberg et al., 1959).
- Ensure recruits are provided with realistic expectations about the job.
- Develop a formal exit interview process.
- The areas and ways agents can be promoted should be made more apparent to agents.

Another area of focus is to describe the potential factors that led to a decrease in JE levels at approximately 10 years of working in the same county. Additionally, there was no connection between the length of time worked in a county and the number of links formed in the CEAs community or Arkansas CES, which is the opposite of what might be expected. Examining the factors that lead to interpersonal relationships within counties and potential barriers and opportunities to forming those interpersonal relationships is the final recommended study.

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COMPLETED PROJECT

Extension Education, Teacher Preparation

DEFINING WORK-LIFE BALANCE OF WORK-LINKED SPOUSES

## **Defining Work-Life Balance of Work-Linked Spouses in Agricultural and Extension**

### **Education: A Pilot Study in Qualitative Content Analysis**

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### **Abstract**

When considering the circus of postmodern society, the demands of work and personal life are often featured as the main balancing act. The trick usually features the domains of work-life and family-life as separate spinning plates, but what happens when these plates are stacked on the same pole and spun at the same time? Little is known about the work-life dynamic of individuals who work with their family in the field of agriculture education. In this study, we address the questions, “how is ‘work-life balance (WLB)’ interpreted by work-linked (W-L) spouses in agriculture education?” and “how do agriculture educators perceive their own WLB?” Agriculture educators were interviewed to explore their experiences of sharing a similar occupation with their spouse. The collected data were reviewed using content analysis and results showed that participants think of WLB as a myth, or unrealistic expectation at least. Some perceived the term as an unattainable goal, while others felt that ‘balance’ was a word poorly chosen to represent the concept as they understood it. These results have practical implications for the usage of professional rhetoric concerning the topic commonly referred to as “work-life balance” and professional development opportunities aimed at improving educators' perceived efficacy in work and family roles.

# **Defining Work-Life Balance of Work-Linked Spouses in Agricultural and Extension**

## **Education: A Pilot Study in Qualitative Content Analysis**

### **Introduction**

Maintaining a manageable work-life balance (WLB) as a public school teacher in the US is often cited as a difficult task and failure to do so is linked to teacher attrition (Crutchfield et al. 2013; Miryala & Chiluka, 2012; Murray, Flowers, Croom, & Wilson, 2011; Sorensen & McKim. 2014). One recent study revealed that nearly 40% of teachers found it “difficult to impossible” to resolve work-family conflict (WFC) and maintain a satisfactory WLB (Murray et al., 2011), which are factors related to agriculture teacher attrition (Murray et al., 2011). And while current literature offers much insight to the link between WLB and teacher attrition, there is a gap in understanding how these factors are experienced by teachers with work-linked (W-L) family members for whom the boundaries between work and family are not clearly defined.

The purpose of this study was to explore how WLB is perceived by W-L spouses in agricultural education. The study utilized the content analysis methodological approach to focus on the research question, (1) “how is the concept of ‘work-life balance’ interpreted by agricultural educators with W-L spouses?” and (2) “how do these educators perceive their own WLB?” Exploring these questions will broaden the understanding of W-L spouses' unique experience with work-family relationships and how these relationships affect their role as an agricultural educator. If W-L spouses teaching agriculture fail to maintain a WLB, the profession may lose two teachers at once. Furthermore, the concept of integrated work and family roles may provide insight that can be used to develop strategies to help all agricultural educators cope with WFC more effectively.

### **Theoretical Framework**

Boundary Theory (BT) has been used in a wide variety of studies about work-linked spouses (Ashforth, B., Kreiner, G., & Fugate, M., 2000; Michaelsen & Johnson, 1997; Nippert-Eng, 1996; Zerubavel, 1991). BT describes an individual's process for developing a segmented reality in which “home” and “work” are among the most commonly boundary-generated social domains (Nippert-Eng, 1996). BT claims that as roles become more highly integrated, boundaries become less defined and cross-over becomes more prevalent, which is cited as a benefit for the families of W-L spouses, allowing couples to integrate and redefine the domains of “work” and “family” so that WLB has a unique meaning for them (Greenhaus & Powell, 2006).

### ***Work-Linked Spouses in Agricultural Education***

Agricultural education appears to be a family business in North Carolina (Proffitt, W. circa 1984), but until recently little has been done to document instances of W-L spouses in agricultural education (Waddell-Proffitt, J, 2020). Approximately 12% of NC agriculture teachers self-identify as related to another agriculture teacher in the state, many of these include individuals that have a W-L spouse. Out of these, a large portion of the W-L spouses are relatively young with less than ten years of teaching experience (North Carolina Agricultural Education, 2021). There is a lack of research focused on married couples that share an occupation in agricultural and/or extension education. More research is needed to understand the

relationship between W-L spouses in the context of WFC and the WLB of agricultural educators, especially in light of changes affecting the profession as a result of the COVID-19 pandemic. Understanding (1) the strategies used by W-L spouses to resolve WFC and create a sustainable WLB and (2) their perceived advantages and/or disadvantages of integrating work and family domains, may be used to help other educators and prevent attrition due to unresolved WFC.

## **Methods**

Purposive sampling was used (Merriam & Tisdell, 2015, p. 96). Qualifying W-L spouses shared an occupation, employer, or service area (Halbesleben, Zellars, Carlson, Perrewé, & Rotondo, 2010). Participants self-identified as an agricultural educator married to another agricultural educator in NC. “Agricultural educator” was defined as a school-based agriculture teacher (secondary or postsecondary) or an extension-based agricultural educator. All were married for five or more years with at least one child.

The pilot study used a structured interview process to explore how W-L spouses in Agricultural Education manage overlapping work and family roles. An interview protocol was developed using experiential and behavioral questions (Patton, 2015). Participants shared their experiences in an online, structured interview (Merriam et al., 2015, p. 109, 115) via the online video-conferencing platform, Zoom. Zoom produced an audio and visual recording of each interview while the researcher gathered traditional field notes. Zoom generated an interview transcript which was verified and corrected to accurately reflect the participant's comments. The guiding research question focused on how the concept of ‘work-life balance’ is perceived by NC agricultural educators with W-L spouses and a protocol was developed centering on this concept.

Participant transcripts were reviewed using qualitative content analysis (Schreier, 2015). Field notes generated by each interview generated the initial code frame (Schreier, 2015, p. 14). Line-by-line, trial-coding revealed data closely related to participants’ values. The code frame was modified to incorporate values coding. Subcodes were used to describe the attitudes and beliefs expressed by the participants. Once concrete phrases were coded, they were defined (Schreier, 2015) and segmented examples were organized under the code frame's categories. Data present in the context of the stories and examples were analyzed and coded. The collection of data was segmented, checked for mutual exclusiveness and the code frame adjusted once more (Schreier, 2015). The final code frame generated 201 mutually exclusive segments of data that were organized under five main codes and 32 subcodes that described the participants’ attitudes and beliefs about the respective values. Segments were checked for mutual exclusiveness. Salient literature was repeatedly reviewed to compare findings and decide how to further refine the coding system used to produce the most accurate results. (Merriam et al., 2015, p. 196-216) Transcripts and drafted results were shared with participants for member-checking (Maxwell, 2013; Merriam et al., 2015, p. 246-247) and a journal has been kept to reflect on methodology and audit the research process (Merriam & Tisdell, 2016).

## **Results**

### ***Contextual Findings***

Four W-L couples represented in this pilot study had several demographic similarities that may have influenced their experiences within the home and workplace. Each of the spouses identified

as Caucasian, Christian, heterosexual, and of a similar age, ranging from 29-39 years old. The couples had been married for a minimum of eight years and a maximum of 15 years. The couples shared the same socio-economic status, as well as a nuclear family structure in which both spouses were active in parenting roles. Family roles were flexible, but a hierarchy also existed within this family structure. “As my [spouse’s partner], [spouse’s] first responsibility is to me. And then [spouse’s] second responsibility is to our children... It’s about what needs to get done, not about who needs to do it (Participant 3).” Lastly, all couples expressed security in their relationships and considered themselves to be successful examples of a W-L couple as well as a healthy marriage. “We’ve got a good foundation and we’re adding to it (Participant 6).” It is our interpretation that these perceptions stem from shared foundational beliefs that contribute to the couple’s satisfaction in their marriage at home and at work. “I think it may have been the leadership kind of stuff that we did in FFA, or that both of us have been engaged in agricultural leadership programs as adults, but you go through those exercises where you explore and learn more about yourself (Participant 4).” Because of their experiences in the agricultural community throughout their lives, participants’ values were independently but similarly developed from a young age, creating a strong foundation for the spouses to build their partnership across work and family domains.

### ***Interpretation of ‘work-life balance’***

The values of *work* and *family* were the central focus of participants’ perception of WLB. Out of the 201 segments of data analyzed, *work* was mentioned 41 times, while *family* was referred to 38 times. Participants felt strongly about their roles as parents and the agricultural work of which they are engaged. Participant discussion about WLB included little description of anything outside of *work* and *family*.

While the work domain is an essential piece to any discussion about WLB, *work*, itself, was identified as a theme and an important shared value among the participants. Participants viewed their role as an agricultural educator as more than a 9:5 job. “Work is important and that work allows us to do the other things we like to do (Participant 5).” Participants also viewed agriculture as an integral part of their identity. Three of the four couples shared more than one work-link with their spouses, indicating the importance of work, but more specifically the value of agricultural work since all side businesses were a family farm operation in which the spouses were primary partners. Participants reinforced this position with statements like, “Our farm is a huge accomplishment too. It’s a little farm, but we’re pretty proud of every blade of grass on it (Participant 2).” “Sometimes, we’re like ‘Wow, why don’t we just be like normal people and go on vacation and just chill out,’ but we actually enjoy working, being productive and taking care of the livestock, seeing the fruits of our efforts’ (Participant 6).” “We work in the barn together and travel showing animals (Participant 5),” and “Our time together usually involves some kind of animal or cool outdoorsy activity, but a lot of the time that we spend together is work (Participant 4).” Agricultural work was an important part of the participants’ identities.

*Family* was defined in various ways, but every participant emphasized their children as a high priority. Participants described having children as a “significantly significant (Participant 3)” experience, a “major responsibility (Participant 4),” and their “biggest accomplishment (Participant 2).” Participants reported that their children were their “whole world (Participant

1),” and that “everything that I [the participant] can possibly accomplish in my lifetime will go to my child and is for my child (Participant 2).”

Participants 1, 3, 5, and 6 alluded to previous jobs in which WFC was more frequent. And that making a move to their current position was the “right choice” for their career and family. Participant 3 reflected on previous employment, saying, “There was no WLB. I was on call 24/7 whether I was at home. I was at church. I was out of town, whether it was during the work day or whatever. Even at three o'clock in the morning, I was on call.” The same participant continued to describe their current situation saying, “When I started this job, I told myself I really don't have to answer emails at 9 or 10 o'clock at night... and try my best to set boundaries... WLB is much better with Extension.”

Based on these descriptions of balancing work and family domains, we have deduced that participants' interpretation of the term 'work-life balance' is the absence of WFC. WLB is experienced by these individuals when the domains of work and family are harmonious, but not necessarily separate. This was emphasized explicitly by Participant 6 who completely rejected the WLB term, adopting a revised version coined by a University professor the participant encountered through professional development.

He [the University professor] said we shouldn't call it ‘balance,’ because when things are balanced, that means they're equal... we should really call it ‘work-life harmony,’ because it's not equal balance, but it is how they work together (Participant 6).

After synthesizing this explicit definition and information provided by other participants, it emerged that the group's collective interpretation of the concept commonly referred to as ‘work-life balance’ is one's ability to integrate personal and professional roles so as to meet the demands of work and family domains simultaneously and without conflict.

### ***Perception of Work-Life Balance***

Based on the stories and examples provided by the participants, it was clear that WLB was perceived as a difficult goal, but also an ongoing process. “That's a hard one (Participant 2).” While many felt they had improved in this area over time, they still hinted at feelings of inadequacy. “Work-life balance--what's that? (Participant 1).” No one felt that ‘balance’ was an appropriate way to describe their personal management system for work and family domains. Since participants were unable to apply ‘balance’ to their personal situation, many seemed to feel as though they were not successful in meeting the expectations of their work and family roles, negatively impacting their perceived WLB.

Perception also varied by experience in struggling with WLB. More experienced W-L spouses expressed higher self-efficacy in managing WFC. In the examples below, quotes are arranged from least to most experienced. The least experienced participant expresses the most guilt and frustration while the more experienced participant was able to see how external factors may affect educators' perceptions. No degree of guilt is expressed in Participant 6's statement, whereas these guilt feelings are present in Participant 1 and 2's comments.

I'm not able to just turn it off. I know some people who pick a street sign on their way home every day and that's the end of work. For me, I will think about it again and again until tomorrow. I've never been that person. *I wish I could be like that* (Participant 1).

*I could do better.* I think everybody can say they could do better, but you have to figure out where those boundaries are. And I don't think we ever sat down and described that boundary... it kind of just happened on its own for us. We'll tell each other. 'Okay, that's enough...' *Most of the time* I hear [spouse] and [spouse] hears me (Participant 2).

There's a lot of factors that play into that term of 'work-life balance.' But I do think that teachers ultimately are in control and they just need that perspective, because I think oftentimes they're the people who set the expectation for what has to be done, and maybe they're a little misguided (Participant 6).

Participant 6's quote does well to summarize the idea that educators have the skills and abilities to successfully manage WFC, but expectations set by others, or even poor terminology (eg. the use of the word 'balance') may create barriers to them feeling as if they are actually doing so. Participant 6 also reflected:

There are times...when I'm gone for a solid week and it's intense; the month of April is just absolutely wide open, sideways (meaning very busy)... but then there are slow times too, you know. I just have to keep in mind that there are different seasons... and that helps my perspective [on WLB] (Participant 6).

Participant 6 is also the individual who subscribes to the term 'harmony' rather than 'balance' which may contribute to a more positive perception, which will be discussed more later on.

## **Implications**

### ***Implication #1: Complete Separation of W-L Domains is Impractical***

Agricultural work is an integral part of the W-L spouses relationship and continues to be a source of connection for them--and even their children--throughout their lives together. Agriculture is a community that both spouses entered as youth. They continue to build on this foundation as they become more invested in the industry as professionals and expose their children to the industry. Being an agriculturist is critical to their identity as a professional, but also in their personal lives.

Holding on to your integrity, as a couple as well as individuals, is important and knowing what [agriculture] you stand for as a couple, and as parents, and as people in the community and then working towards your shared goals... I think the influence that [impact] has had, and that it will continue to have down the road is a big thing (Participant 2).

The "impact" Participant 2 is describing seems to be a reciprocal one. The participant is describing the impact the participant's family has on the agriculture community as well as the impact the agriculture community has on the participant's family. The W-L couple spends the vast majority of their time working in agriculture, either on their farm or to the agricultural community's benefit as Extension agents. And so, their child is being raised in this community

and will be shaped by its culture. And since this participant has already stated that all their actions are for the benefit of their child, this statement is certainly “a big thing.”

Being unable to separate their work from their identity is a unique characteristic that is not seen in all professions, but is seen in other agricultural careers, especially farming (Kunde, Kølves, Kelly, Reddy & De Leo. 2018). It is not practical to suggest that these individuals separate work and family domains as the boundaries between these roles are heavily integrated as a result of the culture of the agricultural community. Therefore terms such as ‘work-life balance’ negatively impact W-L spouses’ perception of their ability to manage work and family roles and should not be used in reference to this population.

### ***Implication #2: Raising Children Enriches and Complicates W-F Domains.***

Creating a family was a rewarding experience for W-L spouses, but being parents increases WFC for participants. W-L spouses who were also parents continued to prioritize work, but the couple’s children were their highest priority. Participants who experienced significant WFC resolved it by changing occupations. Participants chose a job that allowed them to continue serving the agriculture industry, but without significant WFC. This family-first decision-making process reiterated family as participants’ highest priority and identified this value as a key factor for job choice for W-L spouses with children. Furthermore, other domain management decisions discussed by the participants focused on increasing their accessibility to their children, not work. These choices clearly indicated that if WFC cannot be resolved with resources at hand, the W-L spouses will resolve it by changing jobs..

### **Recommendations for Future Research**

This study reinforced the idea that agricultural educators perceive WLB “as difficult to impossible” (Murray et al. 2011). However, the qualitative analysis of this problem revealed that the participants considered *family* as the weight tipping the scale between the work and life domains. If domains are integrated, the scale can manage a sort of equilibrium, but a separate and equal balance is not practical to their lifestyle. Participants’ experiences revealed that resolving WFC is possible and that having a work-link with their spouse positively impacted their experience. However, it was also revealed that the language and strategies surrounding the concept of WFC and managing work and life domains can be misleading and may be negatively impacting educators’ perceptions and expectations. Terms such as ‘work-life balance’ may even be contributing to educator attrition. More research is needed to explore this relationship as well as the benefits of W-L spouses working as agricultural educators, especially those spouses with the highest level of overlap (eg. extension agents serving the same county or area of focus (eg. livestock, horticulture, row crops, etc) or spouses teaching agriculture at the same school. It may also be helpful to explore other instances of W-L family members to determine the specific benefits of sharing an occupation with one’s siblings, parents, and/or extended family. Understanding these relationships could allow researchers to make recommendations for professional development opportunities showcasing strategies to relieve WFC or help institutions and other profession-related organizations create policies and a work culture that normalizes and promotes work-life integration as a means to prevent and/or resolve WFC.



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# **Storying Outdoor Youth Education: A Historical Narrative of the Louisiana 4-H Camping Movement**

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## **Introduction and Review of Literature**

During the late 1700s, it is estimated that nearly 85% of the U.S. employed population was engaged in the agricultural industry (Seevers & Graham, 2012). The unique circumstances during this period led to the need for increased youth leadership and the development of greater agricultural literacy. In response to this need, agricultural societies emerged on the coattails of a growing scientific community and began to target agricultural-based issues and problems (Seevers & Graham, 2012; Stimson & Lathrop, 1942). Although some agricultural societies addressed best livestock breeding practices, others focused on soil reclamation and amendment techniques. Many agricultural societies also invested in publishing and promoting scientific knowledge to the public through publications, newspapers, and formal presentations (Croom, 2008). This work appeared to foment expanded opportunities for the public to gain access to agricultural knowledge, especially for youth. Early agricultural professionals would also assemble at centrally located farmer institutes to share knowledge and innovations during this period. This allowed low-income farmers to socialize and exchange ideas by offering a low-cost alternative to conferences in urban areas (Seevers & Graham, 2012).

After the reconstruction era, the foundations of the Cooperative Extension Service (CES) began to take root (Gordon 2020; Stimson & Lathrop, 1947). However, the CES experienced many struggles in its formative years, such as a lack of effective curriculum, qualified professionals, and adequate financial support. In 1857, Vermont Representative Thomas Morrill presented the first version of a bill to Congress that would later lead to the creation of the land-grant university system (Seevers & Graham, 2012). Thereafter, many states sought to improve further their citizens' knowledge and skills in regard to agricultural practices. As a result, the U.S. Congress passed the Smith-Lever Act (1914), which formalized the CES and provided funding to diffuse knowledge about agriculture, home economics, and related subjects. Before this, many agricultural boys and girls clubs, including 4-H, had been closely associated with the CES. Therefore, the passage of the Smith-Lever Act "effectively nationalized 4-H" (National 4-H History Presentation Program, 2017, para. 6).

Perhaps one of the most formalized ways that 4-H has fostered agricultural innovation and practical education has been through their outdoor youth education program, more commonly known as 4-H Camp (McCormick & McCormick, 1984). The origins of 4-H camping have been traced to 1915, "when the first county camp for both boys and girls was conducted in Virginia" (Carter, 2006, p. 21). However, West Virginia created the first permanent campsite for youth in 1921. As such, camping has been central to the mission and operations of 4-H since its early beginnings. Although 4-H Camps were first established for local clubs, camping events soon expanded to the state and national levels (Hoover et al., 2007). In fact, three years after the establishment of the first 4-H Camp, more than 1,700 had emerged across the U.S., with attendance surpassing 100,000 youth (Meadows, 1997). It is also critical to note that the National

4-H Conference, where youth 4-H officers from each state assembled at the nation's capital to discuss the organization's direction, first began as a camping program (National 4-H Conference History, 2012). Originally named the *National 4-H Club Camp*, youth officers camped in U.S. Army tents across the Washington Mall at the base of the Washington Monument at the inaugural camp in 1927 (Coreil & Tassin, 2008; National 4-H Conference History, 2012). At this event, 142 youth officers from 38 states attended, including five youth officers and two female sponsors from Louisiana (see Figure 1).

### Figure 1

*Louisiana 4-H Youth officers posed in front of the Washington Memorial at the first National 4-H Camp in 1927*



*Note.* Photograph used with permission from the Louisiana 4-H Camp Archives.

Because of its massive growth, the 4-H Camping movement became celebrated as a novel technique to motivate youth to engage in agrarian concepts (Carter, 2006). According to the National 4-H History Preservation Program (2017), camping has remained one of the most powerful educational opportunities youth have engaged in over the past 100 years. Despite this, little work has been done to document the historical origins and evolution of the camping movement. Therefore, a need emerged to describe the actors, forces, and events that led to the prevalence of 4-H Camping in Louisiana.

### Purpose

The purpose of this historical narrative was to describe the origins and evolution of the 4-H camping movement with special attention on Louisiana. Because this investigation coincided with the 100th anniversary of the first permanent 4-H campsite (Carter, 2006), we intended to narrate how the organization used recreation and outdoor education to foster positive youth

development. Through this investigation, we also hoped to create discourse about strategies that 4-H could use to ensure the program remains accessible and available to the youth in the future.

## **Methods**

We used a historical narrative approach to achieve the study's purpose (Salevouris & Furay, 2015). Investigators analyze the actors, events, and occurrences that shape a phenomenon when engaging in historical research. Therefore, a central assumption is that the historical record can be reconstructed through the collection of primary and secondary sources (Salevouris & Furay, 2015). In this investigation, we used the following sources of data to story the 4-H camping movement: (a) artifacts, (b) documents, (c) interviews with four leaders of the Louisiana camping program, and (d) photographs. Semi-structured open-ended interview sessions were conducted via Microsoft Teams, recorded, and transcribed for analysis. We also used internal and external criticism to ensure the sources were quality before including them in our analysis (McDowell, 2002).

To analyze the data, we used Corbin and Strauss' (2015) constant comparative method. Using this approach, we analyzed the data through three distinct cycles of coding that resulted in the findings being "rooted in the original data themselves" (Corbin & Strauss, 2015, p. 51). To begin this process, we organized the data chronologically and then engaged in open coding by which we coded the data line-by-line. Then, to reduce the data, we used axial coding to scrutinize relationships among the open codes. This process resulted in the development of categories. In our final stage of analysis, we used selective coding to consider our categories in concert with the historical context (Corbin & Strauss, 2015). As a result of this process, four themes emerged that tell the story of the 4-H camping movement in Louisiana.

## **Findings**

Through our analysis of the data, four themes emerged: (1) early foundations, (2) facility infrastructure development, (3) impact and organizational changes, and (4) the evolution of programmatic delivery. When considered together, the themes knit together the story of the Louisiana 4-H Camp. It should be noted that we used pseudonym for participants in this investigation to facilitate a blind review. However, approval was provided by Louisiana State University IRB and participants to use their real names to preserve an accurate historical record.

### **Theme 1: Early Foundations**

In 1922, a wealthy landowner, Rufus Walker, donated his land in Pollock for use for the annual Louisiana 4-H Summer Camp (Cantrelle, 1986; Fiser & Coolman, 2004). Six years later, Rufus Walker then deeded this land for the use of 4-H Clubs in the area. By 1936, the campgrounds were officially designated as *state lands* after the Louisiana Government presented a formal petition to Louisiana State University – home to the CES system that oversaw 4-H (Camp Grant Walker, 1941). This change was primarily strategic to make needed improvements to the 4-H Campgrounds to expand opportunities to youth throughout the state. For example, with government funding, construction of permanent structures began at the campgrounds, which had been prohibited previously. The Federal Works Progress Administration (WPA), created under President Franklin Roosevelt's New Deal, was largely responsible for the construction of Camp

Grant Walker (Works Progress Administration of Louisiana, 1938). Figure 2 depicts the capital improvements that occurred at Louisiana 4-H Camp as a result of the WPA.

**Figure 2**

*Improvements to Louisiana 4-H Camp the WPA after being Designated as State Lands*



*Note.* Photographs used with permission from the Louisiana 4-H Camp Archives. <sup>1</sup>Leveed banks of Big Creek (Bottom-Left), <sup>2</sup>Residential cabins (Top-Left), <sup>3</sup>An open-air, stone amphitheater (Bottom-Right), <sup>4</sup>A graveled roadway (Top-Right).

## **Theme 2: Facility Infrastructure Development**

Following the initial improvements by the WPA, little documented evidence existed of additional capital improvements until the 1970s, except for the construction of “a new cinderblock dining hall” (Dr. Mark Tassin). According to former Louisiana State University Associate Vice-Chancellor Dr. Dwight Landreneau, in the 1970s, a pool and several new, larger bunkhouses were added to the grounds to replace the original cabins. By 1981, Dr. Tassin reported they had “construct[ed] 11 new bunkhouses.” For several decades, Dr. Mark Tassin served as the Louisiana 4-H Department Head and oversaw camp operations. He reported that in 1986 construction had been completed for a new, larger multipurpose building that also provided

a cafeteria and dining facility for youth. At this time, a large, open-air pavilion was also constructed on the west side of the camp.

Camp Director Christine Bergeron also reported that in 1997, the Louisiana Sheriff's Association "donated and installed a new air conditioning units" for the bunkhouses. Then, in 2007, Louisiana 4-H purchased the neighboring Girl Scouts Camp Site, Camp Windywood, after it had declared bankruptcy. Several small buildings were demolished and a new environmental education building, shooting sports facility, shotgun and rifle ranges, and pond were all completed by 2012. Then, later that year, Roy O. Martin donated \$500,000 to construct a multipurpose building for the camp to have a centralized location for its nearly 600 temporary residents each week during 4-H Summer Camp. This multipurpose building has been the latest capital improvement to the facility.

### **Theme 3: Impact and Organizational Changes**

Over its nearly 100-year history, the Louisiana 4-H Camp has experienced many changes. However, the individuals interviewed reported that the camp had an overwhelmingly positive impact on Louisiana youth. For example, when reflecting on his experiences, Dr. Coreil, who served as the Louisiana State University Vice-Chancellor and Director of the CES from 2001 to 2013, recalled his time as a camper in the 1960s. He explained: "everybody wanted to be in 4-H; the camp was highly attractive to us." He added: "being independent of your parents and learning about things that you could do with hands-on, experiential learning, [it] helped build confidence, responsibility, and practical life skills...." Meanwhile, Dr. Landreneau explained that the camp "provided a forum for youth to develop communication and interpersonal skills." He expanded: "...[you] saw other kids their same age, their peers, and experienced leadership skills. And I think that's contagious. I think that is what camp was all about."

The camping program also evolved considerably regarding its staffing and organizational structure. For example, before 2001, Dr. Tassin explained: "there was no permanent camp director." Therefore, during this period, the camp largely stood idle in the off-season, with Louisiana 4-H personnel managing the summer camp operations. A semi-permanent camp director was hired in the late 1990s to reside on-site during the summer months to provide a more consistent managerial presence before the position was made permanent in 2001. Dr. Tassin recounted: "I went to four or five states and looked at their camping programs, and we made a major revamp." According to Dr. Tassin, the changes included employing summer staff, subject-matter specialists, pedagogical specialists, reducing the 4-H member to educator ratios, and establishing a revolving account to consistently facilitate capital improvements. As a result, Dr. Tassin reported that "We started to be able to build some funds, and some foundation to be able to do some things at camp, not only in hiring, but in facilities and management...expanding staff, and then utilizing camp for other types of activities outside of extension." For example, after expanding its staff and other positive developments, the Louisiana 4-H Camp began to host professional development sessions for extension agents and agricultural education teachers. It also served as a venue for weddings, reunions, and community events.

### **Theme 4: The Evolution of Programmatic Delivery**

The Louisiana 4-H Camp primarily focused on recreational opportunities coupled with outdoor education that featured basic agricultural and environmental concepts in its early days. However, because of limited funds and time, the effectiveness of the curriculum and educational approach varied considerably. Despite this, all four participants in this investigation articulated that the educational and recreational programming of the Louisiana 4-H Camp improved considerably after hiring a permanent camp director. According to Dr. Landreneau, after the camp's curriculum became more focused, its impact grew considerably. On this point, Dr. Landreneau maintained: "We have such low [educational] achievement, and illiteracy is high [in Louisiana], poverty is high...I think that made camp even more important to be part of the solution." He continued: "We just became a professional education organization that was much more structured because of the needs of Louisiana". Meanwhile, Dr. Landreneau suggested that the staff at Louisiana 4-H Camp have continued to make positive improvements: "Now, the Camp Staff are more structured; they have a good curriculum. I think they do a good job of getting instructors, training the instructors, and utilizing the junior leaders in the whole process. Dr. Tassin added that the growing popularity of the Louisiana 4-H Shooting Sports Program, and the ability to offer hunter education training at the camp, had also increased the visibility and awareness of the camp in recent years. Now, Louisiana 4-H boasts one of the nation's largest state camping programs, serving nearly 5,000 youth and every summer (Louisiana State University, 2020). However, according to current Louisiana 4-H Camp Director Christine Bergeron, "We are completely at capacity. Each summer, there are approximately 2,000 children placed on a waiting list." As a result, the need for more capital improvements and staff has continued to persist.

### **Conclusions, Discussion, Implications, and Recommendations**

This investigation described the origins and evolution of the 4-H camping movement in Louisiana. The primary and secondary data used in this study demonstrated how the Louisiana 4-H evolved regarding facility infrastructure, impact, and programmatic delivery. For example, The Grant Walker 4-H Educational Center had many capital improvements over time. We conclude that by designating the camp as *state lands*, this move opened up opportunities for it to seek state and federal assistance (Camp Grant Walker, 1941). We recommend that 4-H camps in other states that have struggled to have the funding needed to make capital improvement explore whether a similar approach might be appropriate in their context.

Participants in this historical narrative narrated an overwhelmingly positive portrayal of the Louisiana 4-H Camping movement. Case in point, multiple participants articulated how the camp helped advance 4-H members' agricultural knowledge, leadership, and interpersonal skills. Despite this, we recommend that future research examine the outcomes that the 4-H camp has had on members more systematically. A limitation of this study was that the participants were leaders of the Louisiana 4-H Camp at different points in time. As a result, they may have had a biased perspective of the outcomes that 4-H members experienced. Because 4-H camping has remained a fixture over the past 100 years across the U.S., we also recommend that a national study be conducted to identify the most common outcomes experienced by 4-H members.

A key implication from this investigation was the need for advocacy among 4-H leaders and agents. For example, the Louisiana 4-H had to navigate multiple barriers throughout history,



such as a lack of funding and staff. However, through individual and collective advocacy efforts, the 4-H camp secured vital resources to better support 4-H members' needs. Therefore, we recommend that Louisiana 4-H agents and camp staff receive professional development to learn how to advocate for the camp with key decision-makers. We also recommend that future research examine effective advocacy efforts that other state 4-H camps have used to secure funding to advance their programming. By gaining more visibility for 4-H camps through advocacy efforts, perhaps this youth development program can be sustained for future generations.

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## First Steps Toward Developing the Multicultural Autonomous Agricultural Educator

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### Abstract

*A lot goes into the development of an individual's identity. Cultural beliefs and the cultural milieu of one's story-lined upbringing allows for the unique development of an individual and to whom that individual can naturally connect. Within agricultural education, the learner receives positive, negative, or stagnant growth based upon their teacher's cultural development. The purpose of this philosophical manuscript is to synthesize the development of self by the provenances that define an educator's comfortability level and an approach to expanding provenances in order to reach a homogenous learning community that can positively outturn the agriculture industry and the education profession. A term coined Multicultural Autonomy as well as Multicultural Autonomous Agricultural Educator is introduced in an effort to provide a foundation for assisting post-secondary students in obtaining the necessary skills to teach a growing population of diverse learners.*

### Introduction

As far back as 1969, scholars in agricultural education recognized the need to (a) determine how to prepare educators for underrepresented populations and (b) that it would be a difficult task to prepare teachers for populations who may live a life different from their educator (Boykin, 1969). The profession waited 35 years for a philosophical perspective to assist agricultural education in a growing diverse society as Bowen (2002) provided his reflections to the profession as the Distinguished Lecturer at the American Association for Agricultural Education in which he introduced the ITAP model of progression: Intolerance, Tolerance, Appreciation, and Proactive Behavior. Unfortunately, the profession have provided gaps in appreciation and proactive behavior as reflected in the demographics of postsecondary enrollment since the 2002 charge.

Since 1965, the American Association for Agricultural Education have continued to monitor the supply and demand of students pursuing a degree in agricultural education and entering teachers in secondary agricultural classrooms. Throughout the duration of the supply and demand studies (Camp, 2000; Lawver, et al., 2018; Kantrovich, 2010), a continual theme emerges; an homogenous population of teachers that do not reflect the expanding population of diverse learners (Boser, 2014). In fact, according to the National Center for Educational Statistics (2020), 2020 is the first year that the majority of public school students are ethnic minorities. Lehman (2017), determined that the growing homogenous teacher education students continue to increase in the lack of connectivity to the growing heterogeneous student population.

Racial heterogeneity is only one of the many cultural differences that agricultural educators have with their students. According to a Pew Research Study (2020), the religious landscape in the United States is more diverse now than any point in the country's history. Although the religious landscape has changed minimally in rural America, other cultural differences do exist. Divorced rural homes were once considered abnormal and over a 50-year period rural families have bi-passed that of families in urban communities (Pew, 2016). As communities continue to expand in industry and global opportunities, language barriers rapidly exist in rural secondary schools

(Tancredi, 2018). Furthermore, as societies become more familiar with cultural identity, youth become more open and comfortable in identifying their sexual orientation, gender identity, and gender expression (Godin, 2020; Polderman, et al., 2018).

Clearly teachers today are entering a multicultural classroom which comes with challenges in connectivity to each student. Alsubaie (2015) recognized the added responsibility leading a diverse class of students through new curriculum and uncharted territories; thus, posits specialized learning techniques, practice, and education are needed in order to effectively educate a broader, multicultural classroom. Within agricultural education, LaVergne, et al. (2012) identified barriers teachers perceived toward an inclusive classroom environment and recommended that strategies and/or solutions be proposed and implemented that will assist in nurturing inclusive learning.

### **Conceptual/Theoretical Framework**

Multicultural Competence is the ability to engage in actions or create conditions that maximize the optimal development of individuals or individual systems (Sue & Sue, 2008). This is developed through an individual's acquisition of awareness, knowledge, and skills needed to function effectively in a pluralistic society; and on an organizational/societal level, advocating effectively developing new theories, practices, policies, and organizational structures that are more responsive to all groups (Sue, 2001).

Sue (2001) developed the multidimensional Model for Developing Cultural Competence (MDCC). The MDCC consists of three primary dimensions of multicultural competence: specific racial/cultural group perspectives, components of cultural competence, and foci of cultural competence. Each cell in the model represents a combination of the three major dimensions. Dimension one pertains to acknowledgement of race or culture while dimension two is composed of the constructs from the multicultural counseling competencies: knowledge, beliefs, and skills (Sue et al., 1998). The focus of dimension three examines the person versus the organizational systems of analysis. The work on multicultural competence begins, and typically focuses, on the individual level (Bingham, et al., 2002) then gradually moves from individual to the individual in their professional setting. If the individual, as a professional, gains competence within the selected cultural dimension, it is only then that they can begin to focus on change within the organization, followed by the community.

Within agricultural education, the model assisted Vincent and Torres (2015) in identifying student perceptions of their teacher's multicultural competence levels. Within the study, they determined that even in classrooms that were not culturally diverse, students were able to identify the personal and professional level of their teacher's multicultural competence, which inadvertently reflected the diversity of their classroom enrollment.

### **Purpose**

In response to the desegregation of public schools, Dr. Henry Schmitt (1971) asked the Agricultural Education profession, "How do teacher education institutions prepare and nurture in a vocational agriculture teacher the energy, sensitivity, enthusiasm, intellectual competence and empathy necessary to teach minority youth and adults?" (p 20). Today, Schmitt's question still lingers as the profession seeks a model for equipping a homogenous population of graduates for

a heterogeneous population of learners. Therefore, the purpose of this study is to propose a model for developing multicultural autonomy that will balance theory and practice for the agricultural educator who will teach youth and adults from multiculturally different identities.

### **Philosophical Foundations and Methodology**

From an epistemological approach, the research utilized a social constructivist philosophical worldview. Social constructivist hold assumptions that individuals seek understanding of the world in which one lives and works (Creswell, 2017). Social constructivist base their decisions on social interactions and occur within the zone of proximal development, rather biology of cognitive structures, which proceeds learning.

### **Multicultural Autonomy Growth Model**

The vision of who one may deliver content to and how one delivers content is biased toward only what has been seen, exposed to, and experienced. However, it is never a bias, rather a provenance toward a distinct cultural subset of individuals. The provenance is based upon the environment one surrounds themselves, by choice and by chance (e.g. topography, geography, religious affiliation, community, socio-economic, racial/ethnic surrounding, social groups, etc.), in order to develop boundaries and solidity; a sense of feeling protected and safe (Harris, 2001). Often one's provenance is developed over a childhood of living in an environment; obtaining comfortability with a defined normal, which inadvertently provides a measure of relationship building skills. The comfortability allows the individual to begin conversations that relate to, not only individuals who they know, but individuals whom they subconsciously profile to be similar to. In the art of teaching, positive impact is assured among students who have homophilia provenance to that of their instructor. The provenance allows for the teacher to already have a multicultural lens to work with, as it relates to the cultural elements within their own provenance.

A problem occurs when the cultural elements of the student's provenance begin to differ from that of the teacher. As the differences increase, the vulnerability for the teacher to disengage, alienate, and create distance becomes a high concern. Obviously, teachers are giving in to the vulnerabilities as students with distinct different provenances struggle to obtain academic success (Kets & Sandroni, 2019) unless approaches, primarily taken by the student, occur, such as assimilation (Yinger, 1981).

But what if the teacher's awareness, behavior, and skill level was strong among multiple provenances? One could infer the more knowledgeable and aware the teacher has within provenances, the larger their skillset is to educate and connect to a broader set of learners. Psychology refers to this expanded knowledge, awareness and skillset as multicultural competence (Johannes & Erwing, 2004), while educators would consider this Culturally Responsive Pedagogy (Gay, 2002). As a result, the teacher then has a distinct gift to connect individuals from the diverse provenances together which creates a plethora of engagement opportunities and in this essence, the educator is reaching a level of Multicultural Autonomy (MA). At the peak of MA, the agricultural educator has the unique skill to gain trust, express empathy, and provide cultural content examples to learners from a variety of provenances without dissimilating from a single cultural element of their own provenance.

A Multicultural Autonomous educator doesn't simply engage themselves in cultural elements that are different from their own; rather the educator immerses within culturally different communities free of anxiety and judgment. When an individual can competently work and communicate with multiple cultural groups and be accepted within the two differing groups as their own identity of self it is called multicultural autonomy. To fully obtain multicultural autonomy, the individual, or in the essence of this manuscript, the agricultural educator, would not change the core cultural elements that identify who they are or, more importantly, their life-long developed cultural provenance.

An individual cannot simply decide they are multicultural autonomous, nor can they maintain the status and then disengage from cultural elements of the provenances that assisted in their arrival of MA. The impression takes work, patience and is on-going. To begin a possibility of autonomy, an agricultural educator must begin with a self-reflection of a) awareness, b) attitude, and c) skills then begin the same process toward the newly discovered cultural elements of a different provenance. As the educator reflects upon their cultural discovery, they experience growth within their own and of other provenances; thus, multicultural autonomy expands as well.

### *Self-Awareness*

Harris (2001) recognized that a lot goes into the identity of self. An individual labels, and/or identifies the identity of others (Layder, 2004), whether it is correct or not, through *social identifiers* (i.e. race/ethnicity, language/dialect, religion, age, sexual orientation, educational level, body type, socioeconomics, ability, family structure, geographic location, etc.). Social identifiers can be helpful and harmful in the perceptions of those around us. However, our self-identity also encapsulates an area that many individuals never see or value, known as *personal identity* (Layder, 2004). Personal identity (i.e. talents, likes, peculiarities, personality, political beliefs, ways of doing things, introvert/extrovert, skills, uniqueness, etc.) plays a major role in defining the individual and truly reflects the group to whom they resonate, acknowledge, and gravitate toward.

As a teenager, youth are growing in their self-awareness (Erikson & Erikson, 1981), which creates a strange dynamic in one's attitude. Gay and Kirkland (2010) believed it was crucial to self-reflect on attitude during critical cultural moments. Many times these critical moments occur in the presence of major global events or simply the environment that we are surrounded by (i.e. friends, places of workshop, home, social media, etc.). Each create critical moments of self-reflection in our growth area of awareness. The same reflection must occur when experiencing anger, sadness, excitement, happiness, and disappointment (Vincent & Drape, 2019). It is important to note that the reflection of these attitudes are explicit awareness and should not be confused with implicit attitudes (Benaji & Greenwald, 2016).

### *Self-Attitude*

It is not difficult to determine attitude by simply taking a stroll through one's social media outlets and examining what the likes, shares, posts, and follows during an era of debate arises. In the absence of social media, humans spar and chum with colleagues on occasional discussions. In these instances, an educator may find themselves experiencing a plethora of emotional stimuli that reflects the attitude they have within, or among a defined cultural element.

Attitude is crucial in how one is perceived and in the interpreted perception in another individual's attitude. Subconsciously, our attitude toward others is driven by our provenance; thus, playing a role in our interpretation and decision making toward someone else. The attitude is lead by thin slicing (Croskerry, 2006), a form of critical thinking that the brain completes when only provided minimal information. Among students with similar provenance, a teacher establishes thin-sliced decisions, often in the forms of discipline, that are more accurate and interpreted more accurately. Unfortunately, gaps exist in the action and decision making when provenances differ – creating issues such as microaggressions and systemic racism (Crutchfield, et al., 2020; Anderson, 2003).

### *Self-Skill*

Within teacher education programs, students begin to determine and define their style of teaching that works effective among the cultural elements they are exposed to. This pedagogical approach comes into question when the methods that worked in previous situations become ineffective among learners from different cultural elements. It is at that moment that a teacher begins to reestablish the pedagogical skill set and expand from what worked among learners of similar provenances to learners who reflect the newly discovered cultural provenances. Skill development is necessary to identify among the teacher what works among other cultural identities; however, skill development toward multicultural autonomy, cannot occur until awareness is addressed (Sue, 2001).

### **Conclusions**

The growth and the progression of the Multiculturally Autonomous Agricultural Educator (MAAA) is based upon the time committed by the educator. As Constantine and Sue (2005) posit that counselors and educators may see growth in their multicultural competence, yet never fully reach a pinnacle; the same can be said toward one's multicultural autonomy. Each learner that enters an educator's environment brings with them a new set of provenances. Within seconds of entering the classroom, the individual learner begin scoping for similar provenances in order to determine the level of likeness. Without having conversations, the learners looks for *social identifiers* in an effort to establish a form of critical mass (Ball, 2004) to maintain a level of safety and security. It is the responsibility of the educator to help learners identify common *personal identifiers* in order to establish a larger critical mass that will result in ownership in curriculum, the interest of their colleagues, expanded mindset, and the learning environment.

An educator is inadvertently increasing inquiry, creativity, and workforce preparedness within the classroom environment (Wells, et al., 2016) when their classroom contains a broad diversity of provenances. Unfortunately, the learner does not gain access to the benefits of a diverse set of provenances, unless a Multicultural Autonomous Agricultural Educator (MAAE) is present and finds pedagogical approaches to exposing the value to each provenance. The MAAE creates paths for provenances to be revealed; thus, taking initial steps in gaining personal awareness and knowledge (Sue, 2001) not only for themselves but also establishing young multiculturally autonomous students. As the agricultural educator continues to refine their teaching skills (Sue, et al., 1998) to work with the newly discovered provenances, their autonomy expands.

Bias toward one particular identity occurs when the provenances present are minimal and likeness prevails. In 2008, McKown and Weinstein found that when a bias toward one or more racial group of students exist, it has significant impact on academic achievement. The author(s)



posit that MA and Sue's (2001) multicultural competency model could positively impact academic achievement gaps as teacher expectancy bias are minimized.

### **Discussion & Proposed Recommendations**

Dr. Henry Schmitt (1971) in response to the desegregation of public schools asked, "How do teacher education institutions prepare and nurture in a vocational agriculture teacher the energy, sensitivity, enthusiasm, intellectual competence and empathy necessary to teach minority youth and adults?" (p. 24) Fifty years later, agricultural education continues to ask questions regarding teacher effectiveness, connectivity, and impact to learners that do not reflect similar provenances. In an ever changing global society, it is imperative that an industry that feeds, clothes, educates, and advocates seeks multiple approaches for assuring the occurrence of learning.

Just as Paulo Freire (1996) admitted to the flaws in the philosophical development of *Critical Pedagogy*, the scholar(s) here identify that the concept presented should serve as a foundational tool for future amendments and refining. The development of philosophy to conception and from conception to theory comes from the utilization of research to model, search for limitations, and seek further explanation; thus, it is recommended that scholars utilize the concepts for discussions, serve as a tool for research, teach as a beginning platform, and encourage others to seek next steps for an intersectionality growth mindset within agricultural education.

Multicultural Autonomy is to be gained, rather than to be obtained. Provenances continue to change, emerge and originate; thus, pushing for continued engagement and skill development. To identify whether an educator is at the point where they can consider themselves autonomously competent within a provenance different from their own, immersion which create memorable thought/life-provoking experiences must occur. Janet Helm (1990) coined the immersion experience as the pseudo-independent phase within her six phases of identity development. Helm posit that once pseudo-independence occurs, then the individual would seek to gain more knowledge and find themselves desiring to immerse among the group. Faculty at post-secondary institutions who seek to develop multicultural autonomy among their students, should create assignments that encourage immersion experiences and individual global travels which foster opportunities for pseudo-independence to occur. As a result, provenances are expanded, cultural knowledge is gained, behavior is transformed, bias are held in check, and skills to connect multicultural audiences are tested and valued.

Later in 1971, Schmitt and Bender challenged the secondary Agricultural Education profession with a charge of "will middle class White Anglo Saxon Protestant vocational agriculture teachers accept minority youth and adults enrolled in vocational education in agriculture?" (p. 282). Agricultural education, for over half a century, have allowed gaps to exist between marginalized and unmarginalized communities (Barajas, et al., 2020; Croom & Alston, 2009; Talbert, et al., 1999; Jones & Bowen, 1998; Schmitt, 1971) with minimal effort to develop paths for closing the achievement gaps. With a teacher who is considered to be a MAAE, opportunities exist for successful pedagogical and andragogical practices that opens opportunities for underrepresented populations as well as connect groups of diverse philosophical differences. By doing so, the MAAE become a leader in school reform, community education, agricultural literacy and non-

profit leadership; thus, assisting populations of socio-economic struggles, racial minorities, gender differences, topographic diversity, varied religious beliefs, and other communities of differences.

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**Examining Ethnic Identity of Undergraduate Agriculture Majors**

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## **Introduction/Theoretical Framework**

Emerging challenges in the agriculture system, especially in both higher education and the agricultural industry, are diversity and social equity issues (Wiersma-Mosley, 2019). Social equity issues, including those relevant to gender and ethnic minorities, are major concerns in agriculture since they relate to poverty, hunger, nutrition, health, natural resource management, immigration and pathways to citizenship, and the environment. In the United States, approximately 92% of farmers identify as non-Hispanic White, and more than 86% of those farm operators identify as men (Jenner, 2014). Understanding ethnic identity and helping students to develop an appreciation for their own and other's ethnic identity is of utmost importance.

Ethnic identity is a factor that has been linked to psychological adjustment among ethnic minority college students (Umana-Taylor et al., 2014). Specifically, those with a stronger identity have been found to have a clearer commitment and sense of belonging to their group (Roberts et al., 1999). Attachment is said to be the most important component of group identity (Ashmore et al., 2004). Cokley (2005) stated the level of commitment is not essentially related to the content of identity, but rather to the mindset of the individual. Phinney and Ong (2007) found individuals with a higher level of exploration are more likely to have a stronger level of commitment.

Ethnic identity is a dynamic and complex construct involving exploration and commitment that develops over time (Phinney, 1989). Ethnic identity is not something an individual is born with (Erikson, 1968). This can be influenced by their daily experiences, and interpersonal interactions (Gaylord-Harden et al., 2007). Research indicates that a strong ethnic identity promotes higher self-esteem, better coping abilities, and increased mastery (Smith & Silva, 2011). Multiple theories posit that adolescents begin to formulate their ethnic or racial identity by exploring and learning about their own group (Helms, 1990). Recent work has found that ethnic identity continues to develop during emerging adulthood, with most of this research focused on college students (Umana-Taylor et al., 2014). Ethnic identity arises from a sense of community within a group or culture (Phinney & Ong, 2007).

Research has suggested that ethnic identity is a central aspect of personality development for ethnic minority group members (Phinney, 2003). It is suggested that more evolved ethnic identity statuses are associated with high levels of self-esteem, career maturity, and overall psychological adjustment (Catalano & Oxford, 2000). Researchers have found minority students in higher education have a lower level of academic achievement compared to non-minorities (Cao & Maloney, 2018). Colleges and universities prepare students for future careers, life experiences, and social interactions that are enhanced by providing students with a diverse education (Locks et al., 2008). Students are likely to form relationships with students with like attributes rather than those who are different due to the need for a sense of belonging (Walton & Cohen, 2011). Stangor and colleagues (2001) have shown that when students are exposed to the perspectives of other students who attend the same college, they show greater change in their own attitudes than when they are exposed to the perspectives of students from a rival group.

The social identity approach guided this study. This theory focuses on a sense of belonging to a group and the attitudes and feelings that accompany a sense of group membership (Taejel & Turner, 1986). Social identity theory posits that group identity is an important part of

the self-concept; people generally attribute value to the group to which they belong and to derive self-esteem from their sense of belonging to that group. Ethnic identity is one type of group identity that is central to the self-concept of members of ethnic minority groups. Based on social identity theory, it would be expected that ethnic identity would include ethnic attitudes and a sense of group belonging. These concepts are important to future leaders in agriculture and to training of professionals in agriculture science. Students who can achieve ethnic identity are assumed to lead to positive attitudes regarding their ethnicity together with a sense of belonging (Phinney, 1998).

### Objectives

The purpose of this study was to identify the agreement with students' perceptions of their ethnic identity. The research questions that guided this study were:

1. To determine student ethnic identity based upon *ethnic identity search* and *affirmation belonging commitment* within online Agriculture courses at Texas A&M University-Kingsville.
2. To determine any perceived difference of *ethnic identity search* and *affirmation belonging commitment* based upon biological sex, ethnicity, and major.

### Methods

This non-experimental, descriptive study focused on post-secondary students enrolled in four introductory level agriculture courses at Texas A&M University-Kingsville. This convenience sample of participants were selected based upon the criteria that they were enrolled in a 1000 level plant or animal science course. After IRB approval, the researchers used the SurveyMonkey online survey tool to email all students in the four courses (AGSC 1451, AGSC 4353, AGSC 1352 & AGRI 4350) during the Fall 2020 semester.

Following an agreement for student participation, all students who elected to participate completed an online version of the Multigroup Ethnic Identity Measure (MEIM). The MEIM (Phinney, 1992) was designed to measure an individual's underlying sense of ethnic identity. The Multigroup Ethnic Identity Measure (MEIM) is a commonly used questionnaire to assess different aspects of ethnic identity (Phinney, 1992). It assesses the way people think, feel, and behave with respect to their ethnic origin. It is comprised of two factors: a developmental-cognitive component (*ethnic identity search*) and an affective component (*affirmation, belonging and commitment*) (Phinney, 1992). The first factor involves discovering personal meanings of ethnic identity through active participation, searching, and exploration. The second factor relates to feelings of belonging to and identifying with one's ethnic background. The MEIM allows students to rate their sense of ethnic identity by selecting how much they agree or disagree with each statement using a 4-point Likert scale, with lower scores indicating more agreement and a higher ethnic identity.

A total of 105 students participated in this study resulting in a response rate of 79%. The participants were diverse, with 59% identifying as Hispanic, 31% as White and 10% identifying as Multiracial. It was evenly distributed with Males ( $n = 53$ ) and Females ( $n = 52$ ). Data were entered and analyzed using SPSS version 26 on measures of central tendency. To follow IRB guidelines, a limitation to the results was that findings could not be parsed and distributed for



each individual class. The MEIM has been used in dozens of studies and has consistently shown good reliability, typically with Cronbach's alpha estimates above .80 across a wide range of ethnic groups and ages (Phinney, 1992). Reliability scores were measured using Cronbach's alpha with .79 for Ethnic Identity Search and .84 for Affirmation & Commitment.

## Findings

The first objective sought to determine student ethnic identity based upon ethnic identity search and affirmation belonging commitment within online Agriculture courses at Texas A&M University-Kingsville. These findings were reported using reverse coding (1 = *Strongly Agree* to 4 = *Strongly Disagree*). These findings are presented in Table 1.

**Table 1**

### *Mean Ethnic Identity Measure Scores*

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Mode</i>
I have a lot of pride in my ethnic group.	105	2.11	1.13	2
I feel a strong attachment towards my own ethnic group.	105	2.13	1.08	2
I feel good about my cultural or ethnic background.	105	2.14	1.21	2
I am happy that I am a member of the group I belong to.	105	2.16	1.23	2
I understand pretty well what my ethnic group membership means to me.	104	2.18	1.00	2
I participate in cultural practices of my own group, such as special food, music, or customs.	104	2.18	1.15	2
I have clear sense of my ethnic background and what it means for me.	105	2.21	1.07	2
I have a strong sense of belonging to my own ethnic group.	105	2.29	1.09	2
In order to learn more about my ethnic background, I have often talked to other people about my ethnic group.	105	2.50	0.94	2
I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs	103	2.55	0.91	2
I think a lot about how my life will be affected by my ethnic group membership.	104	2.59	0.96	2
I am active in organizations or social groups that include mostly members of my own ethnic group.	105	2.70	0.88	3
<b>Overall Mean Score = 2.31</b>				

*Note.* 1 = *Strongly Agree*; 2 = *Agree*, 3 = *Disagree*, 4 = *Strongly Disagree*

The highest levels of agreement were found related to “*I have a lot of pride in my ethnic group*” ( $M = 2.11$ ,  $SD = 1.13$ ) and “*I feel a strong attachment towards my own ethnic group*” ( $M = 2.13$ ,  $SD = 1.08$ ). The lowest levels of agreement were found related to “*I think a lot about how my life will be affected by my ethnic group membership*” ( $M = 2.59$ ,  $SD = 0.96$ ) and “*I am active in organizations or social groups that include mostly members of my own ethnic group*” ( $M = 2.70$ ,  $SD = 0.88$ ). Table two summarizes the findings for the two constructs which indicate that students had a higher mean score related to affirmation, belonging, and commitment ( $M = 2.17$ ,  $SD = 1.01$ ) compared to ethnic identity search ( $M = 2.50$ ,  $SD = 0.66$ ).

**Table 2***Mean Scores by Construct (n = 105)*

	<i>M</i>	<i>SD</i>	<i>Mode</i>
Affirmation Belonging Commitment	2.17	1.01	2
Ethnic Identity Search	2.50	0.66	3

The second objective sought to measure perceived difference of *ethnic identity search* and *affirmation belonging commitment* based upon biological sex, ethnicity, and major. As shown in Table 3, students who identified as Mixed had a higher level of agreement ( $M = 2.23$ ,  $SD = 0.31$ ) for their *ethnic identity search* compared to those who identified as Hispanic ( $M = 2.46$ ,  $SD = 0.69$ ) and White ( $M = 2.67$ ,  $SD = 0.64$ ). It was also found students who identified as Multiracial ( $M = 1.97$ ,  $SD = 0.84$ ) had a higher level of agreement for *affirmation belonging commitment* versus those who identified as Hispanic ( $M = 2.05$ ,  $SD = 1.04$ ) and White ( $M = 2.47$ ,  $SD = 0.97$ ). These findings are presented in Table 3.

**Table 3***Mean Scores by Ethnicity*

	Ethnic Identity Search			Affirmation, Belonging and Commitment		
	<i>M</i>	<i>Mode</i>	<i>SD</i>	<i>M</i>	<i>Mode</i>	<i>SD</i>
Multiracial	2.23	2	0.31	1.97	1	0.84
Hispanic	2.46	3	0.69	2.05	2	1.04
White	2.67	3	0.64	2.47	2	0.97

The participants' level of agreement related to ethnic identity search and affirmation belonging commitment was compared within the students' biological sex to measure perceived differences. We found that males ( $M = 2.44$ ,  $SD = 0.55$ ) had a higher level of agreement related to ethnic identity search compared to females ( $M = 2.57$ ,  $SD = 0.75$ ). It was also found males ( $M = 1.91$ ,  $SD = 0.84$ ) had a higher mean score related to affirmation belonging commitment compared to females ( $M = 2.46$ ,  $SD = 1.11$ ).

The participants' majors were collected to measure differences based upon their majors and their level of agreement to ethnic identity search and affirmation belonging commitment. The higher levels of agreement related to ethnic identity search were found within the students who majored in Plant Soil Science ( $M = 2.27$ ,  $SD = 0.61$ ), Agriculture Science ( $M = 2.34$ ,  $SD = 0.52$ ), and in Agribusiness ( $M = 2.54$ ,  $SD = 0.38$ ). The lower levels of agreement related to ethnic identity search were found within the students who majored in Animal Science ( $M = 2.65$ ,  $SD = 0.83$ ), Agriculture Science with a Teaching Certificate ( $M = 2.65$ ,  $SD = 0.83$ ), and Wildlife ( $M = 2.65$ ,  $SD = 0.70$ ). The higher levels of agreement related to affirmation belonging commitment were found within the students who majored in Plant Soil Science ( $M = 1.76$ ,  $SD = 0.66$ ), Agriculture Science ( $M = 1.70$ ,  $SD = 0.53$ ), and Agribusiness ( $M = 1.84$ ,  $SD = 0.49$ ). The lower

levels of agreement related to affirmation belonging commitment were found within students who majored in Animal Science ( $M = 2.54$ ,  $SD = 1.30$ ), Agriculture Science with a Teaching Certificate ( $M = 2.54$ ,  $SD = 1.30$ ), and Wildlife ( $M = 2.57$ ,  $SD = 1.16$ ).

### **Conclusions and Recommendations**

This study sought to determine student ethnic identity based upon two constructs, ethnic identity search (EIS) and affirmation belonging commitment (ABC). The participants of the study were undergraduate students within the College of Agriculture and Natural Resources. The findings and conclusions of study are applicable to this population of students and may not be generalizable to other colleges within this institution or across other institutions' student populations. From our findings, we draw two major conclusions. First, the ethnic identity among this population is characterized by pride and attachment towards their ethnic group. Second, there are demographic differences in ethnic identity among this population of students.

#### **Defining factors of ethnic identity**

We found the highest factors of ethnic identity among this population of students was their perceived strong attachment to their ethnic group and being proud of their ethnic group. Pride was found to be highest factor in ethnic identity score followed by strong attachment. This is consistent with previous research showing pride in one's ethnic group to be a significant factor in developing one's ethnic identity (Umaña-Taylor et al., 2014). A strong ethnic identity is based on discovery of traditions and culture that is portrayed by pride (Whitehead et al., 2009). Additionally, our findings support the social identity theory's assumption that people attribute value and derive self-esteem from their attachment to a group they feel a sense of belonging to (Taejel & Turner, 1986). In this case, the population of students indicated a strong attachment to their ethnic group, signifying a strong sense of belonging and ethnic identity. While this finding is important for this population comprised largely of Hispanic students, it is of worth to ask the question if this would be found in other institutions with differing demographic composition.

The factor contributing least to ethnic identity among this population was activity in organizations or social groups that include mostly members of their own ethnic group. One possible reason for this is the relatively low participation in student organizations across this population's institution, with less than 20% of students participating in any school organization (cite). This low participation is likely related to the fact that Texas A&M University-Kingsville is a regional campus serving students primarily from the geographic region. Many of the students drive home to their families on weekends and throughout the week, focusing on family and home connections as opposed to social and peer relations on campus. As family is a central focus in the Hispanic culture, the persistent connection to family likely strengthens students' ethnic identity. Another factor likely contributing to lack of activity in social groups that contribute to ethnic identity is the timing of this research. Data were collected during the COVID-19 pandemic, where activities and social group gatherings were largely discouraged across most university campuses across the country.

## Differences in Ethnic Identity

Our second major takeaway from our findings is that demographic differences in ethnic identity exist among this population of students. Hispanic participants had higher ethnic identity scores than White students. One possible explanation of this finding can be linked to studies showing that White students are less likely to identify and discuss their ethnic group membership with others than minority students (Phinney & Traver, 1988). While this may be the case, our finding does contradict some of the literature on this topic. For example, Worrell and Gardner-Kitt (2006) found that Hispanic students had a lower level of sense related to their ethnic identity than non-Hispanic students. Furthermore, Torres and Hernandez (2007) found students who identified as Hispanic displayed the same levels of sense related to their ethnic identity as non-Hispanic students. Perhaps our finding is unique to this institution where Hispanics are the majority and may be easier for students to establish an attachment to their ethnic group.

Our findings indicate that male students reported higher ethnic identity scores than female students. This finding contrasts much research that consistently shows Hispanic females having a greater sense of ethnic identity than males, in part because gender oppression causes ethnic minority females to be more sensitive to ethnic identity issues (Greig, 2009; Martinez & Dukes, 1997). Perhaps our findings are in line with the study by Estrada and Jimenez (2018) who found the multidimensional and gendered social constructs of *machismo* and *caballerismo* to be directly and positively associated with ethnic identity. While the constructs of *machismo* and *caballerismo* (Estrada & Jimenez, 2018) were not measured in this study, it does warrant further investigation.

## Recommendations for Practice and Research

Based on the findings and conclusions of this study, we recommend university faculty help students of all ethnic backgrounds develop a sense of ethnic identity by discussing concepts of ethnic identity often and encouraging participation in campus clubs, organizations, and social groups. Our findings along with other studies suggest White students as well as female students might have a difficult time identifying and discussing their ethnic identity. University faculty should be aware of this and help all students establish a sense of ethnic identity. We recommend this study be duplicated in other institutions with different demographics to see if our findings are unique to this institution or if they are more generalizable across the country. Furthermore, research should be conducted examining the effects of *machismo* on ethnic identity.

This study has helped to define the key factors of ethnic identity among this population and has illuminated differences among student demographics in relation to ethnic identity. Educational researchers and university faculty can benefit from a deeper understanding of ethnic identity among college students. Understanding this can help to inform support systems and programming that positively influence college persistence and success.

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**The Effect of Two Reflective Strategies on Student Multicultural Competency Development  
during an Online Multicultural Course**

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### **Introduction, Purpose, and Research Questions**

The first multicultural course required in core general education curriculum was developed by Denison University in 1979 (Fitzgerald & Lauter, 2004). Emphasis on multicultural education across university campuses has increased in the past half-century (Banks & Banks, 2001). Simultaneously, the agricultural workforce has increased in diversity during the 21st century as a result of globalization and to meet the growing worldwide food security challenges (Handelsman & Stulberg, 2016). Changing agricultural workforce demographics have heightened the importance of multicultural competencies needed to be successful in the industry and a multicultural society.

Multiculturalism can be defined by an individual's (a) multicultural competence (MC; [Banks, 1995; Mallinckrodt et al., 2014; Sue et al., 1992]) or (b) multicultural personality (MP; [Ponterotto, 2010]). MC consists of the knowledge, skills, and attitudes/beliefs domains (Banks, 1995; Sue et al., 1982; Sue et al., 1992) a person may develop to better acknowledge, understand, and appreciate difference (Sue & Sue, 2008). Multicultural personality (MP) explains why individuals may adapt to new or different environments uniquely and why people differ in their desire to improve equity and inclusion (Fietzer et al., 2016). MP traits may provide a basis to predict why individuals develop MC at different levels (Ponterotto, 2010).

AGLE 2403: Agricultural Leadership in a Multicultural Society (hereafter referred to as “online multicultural course” or “the course”) is a three-credit hour asynchronous, online undergraduate course taught through the agricultural leadership major at Oklahoma State University. Objectives for the course are framed by Bucher's (2015) model for diversity consciousness. The course has historically only used asynchronous online discussion (AOD) as the reflective strategy to facilitate students' consideration diversity and multiculturalism in agriculture and to formatively assess learning, even though other reflective strategies for online courses were suggested (Allen & Hartan, 2009; Brookfield, 2013, 2016; Cain & Smith, 2009; Hatton & Smith, 1995; Herrington & Oliver, 2002; Kanuka et al., 2007; Knights, 1985; Markewitz, 2007; Means et al., 2010; Piburn & Middleton, 1997; Pulford, 2011; Seale & Cann, 2000). While evidence-based (Brookfield, 2000; Cain & Smith, 2009; Hatton & Smith, 1995; Hawkes, 2006; Markewitz, 2007; Means et al., 2010), AOD does require a significant time commitment by instructors and graders (Pulford, 2011).

As undergraduate agricultural programs strive to build a prepared workforce in ever-evolving multicultural communities, research to understand MC development through effective pedagogy is crucial. The development of global competencies (Grudzinski-Hall, 2007; Moriba & Edwards, 2013) has been studied in diversity courses within agricultural education and leadership (Rice et al., 2014), yet the specific impact of online multicultural courses within agricultural contexts on MC development is limited. Additionally, evidence-based instructional methods and reflective strategies in online multicultural courses within agricultural contexts is needed.

The purpose of this study was to determine the effect of two reflective strategies (online reflective discussion with peers [ORD] and individual reflection worksheets [IRW]) on MC development among undergraduate students completing an online multicultural course. Two research questions and hypotheses guided the study:

1. Are changes in MC significantly different for undergraduate students in an online multicultural course who complete ORD with peers as compared to those who complete IRW?

$$H_{01}: \mu_1 \text{change in } MC_{ORD} = \mu_2 \text{change in } MC_{IRW}.$$

2. Are changes in MC between the groups significantly different when controlling for MP scores?

$$H_{02}: \mu_1 \text{change in } MC_{ORD} \text{ controlling for MP scores} = \mu_2 \text{change in } MC_{IRW} \text{ controlling for MP scores}.$$

### Theoretical Framework

Transformative Learning Theory (TLT) provides the theoretical framework for this study (Mezirow, 1991, 2000). TLT states critical educational moments may challenge and change the perspectives of students (Kitchenham, 2008; Merriam et al., 2007; Mezirow, 2000). Four stages of learning characterize TLT: (a) experience, (b) critical reflection, (c) action, and (d) reflective discourse (Merriam et al., 2007; Mezirow, 2000). Two stages, *critical reflection* and *reflective discourse*, are essential to the purpose and design of this study.

#### Critical Reflection

Brookfield's (2016) critique of pragmatic reflection emphasizes the necessity of incorporating criticality in the reflection process in order for learning to result. While reflection is the process in which assumptions are identified, questioned, and viewed from different perspectives, *critical reflection* is different in that it involves analysis of the use of power in a learning situation or context (Brookfield, 2000). Additionally, people engaged in critical reflection "try to identify assumptions they hold dear that are actually destroying their sense of well-being and serving the interests of others: that is, hegemonic assumptions" (Brookfield, 2000, p. 126). In the four-stage process of TLT, Brookfield (2000) suggests critical reflection as a precursor to reflective discourse because it establishes the base assessment of assumptions. More so, it is believed that "transformative learning cannot happen without critical reflection being involved at every stage" (Brookfield, 2000, p. 142).

#### Reflective Discourse

Another essential piece of TLT involves reflective discourse. The importance of discourse in the learning process was established by social learning theorists such as Vygotsky (1978) and Habermas' (1984) principle of communicative learning. TLT connects individual reflection and critical discourse through the process of *reflective discourse*. Mezirow (2000) describes reflective discourse as the active dialogue with others to develop a better understanding of an experience's meaning. "Reflective discourse involves a critical assessment of assumptions. It leads toward a clearer understanding by tapping collective experience to arrive at a tentative best judgment" (Mezirow, 2000, p. 11).

## Methods

An experimental pretest-posttest design (Privitera, 2017) was used for this study. The target population were students completing the online multicultural course. A field test in spring 2019 ( $N = 108$ ) and a pilot test in summer 2019 ( $N = 38$ ) were conducted. For this study, a time and place sample (Oliver & Hinkle, 1982) was used from the accessible population of students ( $N = 111$ ) who completed the course during the first eight-week term of the fall 2019 semester. Students were randomly assigned to two sections one week before the course started by the Office of the Register. One section was the treatment group completing IRW ( $n = 58$ ) and the other section was the control group completing ORD ( $n = 53$ ).

The pre-test instrument, administered during the first week, consisted of the six-construct Everyday Multicultural Competencies/Revised Scale of Ethnocultural Empathy (EMC/RSEE [Mallinckrodt et al., 2014a]); the seven-construct Multicultural Personality Inventory-Short Form (MPI-SF [Ponterotto et al., 2014]); and demographic questions to gather age, gender, ethnicity, and religious affiliation data. The EMC/RSEE instrument was administered as the post-test after completion of all activities during the final week.

The Cronbach's (1971)  $\alpha$  value of the EMC/RSEE and MPI-SF constructs ranged from .63 to .89. The overall EMC/RSEE  $\alpha$  was .63. The overall MPI-SF  $\alpha$  was .78. Data were analyzed using SPSS Version 23 software. The following limitations to the study are acknowledged: (a) lack of probability sampling, (b) ecological validity, (c) history effects due to the university's transition to a new learning management system and uncontrollable extraneous variables, (d) testing effects, (e) regression to the mean, and (f) lack of confirmatory factor analysis during the instrument validation process (Privitera, 2017).

## Results

A repeated measures analysis of variance (RM-ANOVA) was conducted to determine if a statistically significant ( $p < .05$ ) difference in MC development existed between students who participated in ORD as compared to students who completed IRW. The assumptions of independent and identically distributed variables, normality, and sphericity (Mauchly's  $W = 1.0$ ) were met. Equal variances were assumed for both the pre-test MC ( $F(1, 109) = .043, p = .836$ ) and the post-test MC ( $F(1, 109) = 1.517, p = .221$ ). There were no statistically significant differences between changes in MC for the two group means,  $F(1, 109) = .765, p = .384, \eta_p^2 = .007$  (Table 1). The  $H_0$  null hypothesis was retained.

**Table 1***RM-ANOVA Comparing the Change in MC Development between Groups*

Source of Variance	<i>SS</i>	<i>MS</i>	<i>df</i>	<i>F</i>	<i>p</i>	$\eta_p^2$	1- $\beta$
Repeated Measure Effects							
PrePost	1.139	1.139	1	36.365	.000	.250	1.000
PrePost*Group	.003	.003	1	.101	.751	.001	.061
Error	3.415	.031	109				
Between Subjects Effects							
Intercept	3025.152	3025.251	1	22306.103	.000	.995	1.000
Group	.104	.104	1	.765	.384	.007	.140
Error	14.783	.136	109				

Descriptive analysis of the study variables indicated statistically significant relationships between pre-test MC, post-test MC, and MP scores (Table 2). As a result of the lack of statistically significant difference between the control and treatment groups' means, attention turned to analysis of the difference when controlling for MP scores.

**Table 2***Correlations between Pre-test MC, Post-test MC, and MP Score (N = 111)*

	1	2	3	<i>M</i>	<i>SD</i>
1. Pre-test MC	-			3.62	.311
2. Post-test MC	.635**	-		3.77	.264
3. MP Score	.410**	.368**	-	3.47	.305

*Note.* \*\*Significant at the 0.01 level (2-tailed).

A repeated measures analysis of covariance (RM-ANCOVA) was conducted to determine if a statistically significant ( $p < .05$ ) difference in MC development existed between students who participated in ORD as compared to students who completed IRW in the course when controlling for MP scores. The assumptions of independent and identically distributed variables, normality, and sphericity (Mauchley's  $W = 1.0$ ) were met. Equal variances were assumed for both the pre-test MC ( $F(1, 109) = .307, p = .580$ ) and the post-test MC scores ( $F(1, 109) = .711, p = .401$ ). There were no statistically significant differences between changes in MC for the two treatments,  $F(1, 109) = .1589, p = .210, \eta_p^2 = .014$  (Table 3). The  $H_{o2}$  null hypothesis was retained.

**Table 3***RM-ANCOVA Comparing the Change in MC Development between Groups*

Source of Variance	<i>SS</i>	<i>MS</i>	<i>df</i>	<i>F</i>	<i>p</i>	$\eta_p^2$	1- $\beta$
Repeated Measure Effects							
PrePost	.099	.099	1	3.175	.078	.029	.423
PrePost*Group	.049	.002	1	.065	.799	.001	.057
PrePost*MP Score	.002	.049	1	1.589	.210	.014	.239
Error	3.365	.031	108				
Between Subjects Effects							
Intercept	9.874	9.874	1	88.455	.000	.450	1.000
MP Score	2.727	2.272	1	24.434	.000	.184	.998
Group	.057	.057	1	.511	.476	.005	.109
Error	12.055	.112	108				

### Conclusions

This study found there were no differences in MC development between students who completed IRW and students who completed ORD in this online multicultural course. Earlier research studies indicated the importance of discussion in online learning (Brookfield, 2000; Cain & Smith, 2009; Hatton & Smith, 1995; Markewitz, 2007; Means et al., 2010; Pulford, 2011). In comparing students who completed IRW to students who completed ORD, no difference was found between the group mean change in MC. Preliminary analyses to establish correlation between study variables found moderate relationships between student post-test MC, pre-test MC, and MP scores. When controlling for MP scores, there were still no differences in the group mean change of MC among students.

Our findings suggest there may be no added learning benefit to ORD when compared to IRW in online multicultural courses. Brookfield (2000) suggests critical reflection as a precursor to reflective discourse in the transformative learning process; the findings of this study support this notion. These findings also counter the conclusion of other scholars who found online discussion more advantageous to learning than other forms of reflection (Cain & Smith, 2009; Kanuka et al., 2007; Markewitz, 2007; Pulford, 2011). Although a preference for AOD is evident in the literature (Brookfield, 2000; Hatton & Smith, 1995), this study does not provide evidence to preference it in this online multicultural course. It can also be concluded from this study that at least two stages of the transformative learning process (Mezirow, 2000), critical reflection and reflective discourse, result in MC development during the online multicultural course.

### **Discussion, Implications, and Recommendations**

Rather than solely relying on reflective discourse strategies such as AOD in online multicultural courses, the inclusion of multiple reflective strategies may be sufficient to meet student learning goals (Brookfield, 2000; Hatton & Smith, 1995). This study suggests the benefit of both ORD and IRW as online reflective practices to support the transformative learning process.

Multicultural instructors should consider incorporating either ORD, IRW, or both, as reflective strategies in online multicultural courses taught in agricultural contexts. Any single strategy should not be viewed as a one-size-fit-all instructional method to guide students through transformational learning in an online multicultural course, as both prove conducive. Likewise, instead of solely adopting AOD because of its prevalent use and assumption as a best practice (Allen & Hartman, 2009; Hawkes, 2006; Piburn & Middleton, 1997; Seale & Cann, 2000) instructors should consider other evidence-based strategies.

Further research questions exist for online multicultural instruction in agricultural contexts. The factorial structure of this study's instruments should be explored among the target population at Predominately White Institutions (PWIs) completing an online multicultural course to determine alignment with initial validation procedures. Differences among the constructs of the instruments based on reflective strategies should also be studied and analyzed using multivariate and multilevel modeling techniques. MC development of students after completing the course should be investigated longitudinally. This study should be replicated using other online reflective strategies and at other PWIs with data analysis procedures influenced by critical race theory to improve generalizability. Additional variables not included in this study could be considered to find if they play a role in student engagement, learning, and MC development in online multicultural courses.

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# **The Relationship of Teacher Expectancy and Secondary Student Performances in Single Sex and Coeducational Classrooms**

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## **Abstract**

*Teacher beliefs and environmental conditions influence student performance outcomes. In this non-equivalent comparison quasi-experimental design study, students enrolled in ten secondary Principles of Agriculture courses assigned to a control or treatment group based upon their sexual identity. Teachers are asked periodically on their expectations of student performances. Over the course of the academic semester, students within the treatment group maintained higher grade point averages and better attendance. Boys from the treatment group maintained a higher percent of non-discipline referrals than boys from the control group. In addition, correlations are made between the teachers' expectations, and student performance and student career aspirations. The researchers recommend that secondary schools consider single-sex classrooms for entry-level agricultural courses and for additional research to be considered to further strengthen the preliminary findings.*

## **Introduction**

In 2001, the No Child Left Behind (NCLB) Act began to allow public schools to offer same-sex classes, which led to the 2006 amendment to the Title XI regulation that removed the ban on single-sex public education. Title IX is the section of the Every Child Succeeds Act that prescribes gender equity in public education's in-school and extracurricular activities. Since NCLB, over 1,600 school districts across the United States have implemented some degree of single-sex education (Klein et al., 2014).

As more school districts across the United States implement same-sex classrooms, the research that supports this learning environment remains widely disputed; especially, with a deficiency of same-sex education research in public schools. Pahlke et al. (2014) conducted a meta-analysis of 453 single-sex education studies that exposed an array of methodological issues.

Although none of Pahlke et al. (2014) meta-analysis included studies within agricultural education classrooms, research regarding one particular sex is not uncommon. Although most of the recent literature that has emerged is regarding gender dynamics at the post-secondary level (Cline, et al., 2019; Murphey et al., 2016; Kleihauer et al., 2013), some studies have investigated the effects of gender on the secondary level (i.e. Chumbley et al., 2015; Kagay et al., 2015; Velez et al., 2015; Ricketts et al., 2004). Newsom-Stewart and Sutphin (1994) found that girls and boys held differing perception about agricultural education and called for further investigations that "examine cultural and gender differences" in SBAE (p. 55). Their recommendation for future research spurred studies that investigated the effects of gender on student achievement (Johnson et al., 1998), students' rationale for course selection (Sutphin & Newsom-Stewart, 1995), and the emergence of girls in leadership roles (Ricketts et al., 2004). Over 25 years after Newsom-Stewart and Sutphin's introductory study on gender dynamic, literature in SBAE still remains scarce in gender studies and gender related issues (Enns & Martin, 2015).

Ricketts et al. (2004) found that male students participated in more technical skilled projects (i.e. mechanics, tractor operations) while female students participated in more soft skilled projects (i.e. agricultural communications, marketing, public speaking). The authors called for extensive research to uncover if this phenomenon continued to occur. Rosch et al. (2015) conducted a longitudinal study to measure leadership gains (skills, confidence, and engagement) in secondary agricultural students and found female students gain significantly in leadership while male students did not.

At present, no literature regarding the effectiveness of same-sex classrooms in school-based agricultural education (SBAE) courses is in existence. As such, this study sought to address the absence of literature by examining the effectiveness of same-sex classrooms and teacher effectiveness in SBAE programs in Kentucky. This research aligned with priority four (meaningful, engaged learning in all environments) of the national research agenda for the American Association of Agricultural Educators by evaluating the learning environment of single-sex classrooms in agricultural education (Roberts et al., 2016).

### **Literature Review/Theoretical Framework**

The guiding framework of this study is the Pygmalion effect, which posits that teachers' beliefs influence student outcomes (Rosenthal, 2010). Such teacher beliefs are often called teacher expectations or teacher expectancy. These expectations can be based on a teacher's knowledge of a student (Good, 1987), such as previous grades, behavior, or perceptions of in class performance, but are also based on one's prejudices and biases (Reyna, 2008). Rosenthal and Jacobson (1968) hypothesized that a teacher's expectations induce change in their own behavior towards specific students, which then may lead to differences in academic performance. For example, a teacher with a belief that a certain student will not perform well in mathematics because of their previous math grade (teacher expectation), may reduce the amount of effort they put into teaching the student (behavior), which may cause the student to actually perform poorly on a mathematics assessment (academic performance). In this way, the Pygmalion effect is a self-fulfilling prophecy (Merton, 1948); a teacher's poor expectations result in poor student performance and a teacher's high expectations induce greater student performance.

Over 50 years of empirical research has established the strong predictive power of teacher expectations (Jussim & Harber, 2005). Within an academic setting the Pygmalion effect can predict whether or not a student succeeds in their academic performance (Friedrich et al, 2015; Hinnant et al., 2009; Good & Nichols, 2001; Rosenthal, 1972), predict how students are placed in ability tracks (Anderson, 2018), and predict the development of self-concepts (Trouiloud et al., 2002). Mostly, academic outcomes are measured through course grades or end of course tests (Jussim & Harber, 2005). Although the predictive power of the Pygmalion effect is widely accepted, teacher expectations remain broad within academic settings (Friedrich et al., 2015).

Murdock-Perriera and Sedlacek (2018) posits that sources of teacher expectations may include preconceived biases and personal factors, such as empathy. Despite a broad view of what creates or considered a "teacher expectation," the effects of teacher expectancy are argued to be an agent of educational inequality (Anderson, 2018); especially, in students who belong to a stigmatized group (Jussim & Harber, 2005). For example, the academic performance of minority students

can be hindered by teacher expectations. Other scholars have suggested that teacher expectations may contribute to differences in achievement between boys and girls. Gentrup and Rjosk (2018) showed that students who were subject to strong teacher expectation biases showed high or low achievement gains.

Although teacher expectancy has been well cited in educational research (Rosenthal, 2002), scholars have yet to investigate teacher expectations in the contexts of SBAE. The researchers investigated the single-sex learning environments and the relationship between teacher expectancy and various student outcomes.

### **Purpose/Objectives**

The purpose of this nonequivalent comparison group quasi-experiment was to evaluate the effectiveness of single-sex classrooms through the lens of the Pygmalion effect theory. The following research objectives guided the scope of the study:

RO1: Describe the student performance outcomes of  $X_{+1}$ ,  $X_{+2}$ ,  $X_{-1}$ , and  $X_{-2}$  in terms of academic performance, attendance, behavioral instances, and FFA membership.

RO2: Examine the relationship between teachers' expectations and student performance.

### **Methodology**

This quasi-experimental design is recommended in educational field research for ethical, practical, and legal reasons (Steiner et al., 2009). Such reasons include safeguarding the rights of minors, the difficulty to enact randomized sampling in school systems, and following legal boundaries for school records made the use of a quasi-experimental design justified. Determining how the treatment groups and control groups initially differ which is critical for indicating the possible operation of internal threats to validity (Bell et al., 1995).

Random of assignment in higher order units (classrooms) were employed, which is appropriate for educational field research (Shadish et al., 2002). Both students and their parents were given the option to opt-out of same-sex classrooms within the first week of school. The researcher was unable to randomly assign students due to practical restrictions set by schools.

The intervention for this quasi-experiment was separating the *Principles of Agriculture* courses in homogenous, same-sex classrooms. Group A-boys ( $X_{+1}$ ) consisted of treatment classrooms where boys were taught by a male teacher. Group A-girls ( $X_{+2}$ ) consisted of treatment classrooms where girls were taught by a female teacher. The remaining school consisted of two heterogeneous, co-educational classes that formed the control group ( $X_{-}$ ). One control group class was taught by a female teacher while the other was taught by a male teacher. The intervention lasted one semester for a total of 15-weeks. No other intervention was provided. All instructors taught the *Principles of Agriculture* course to state standards.

The assessment of threats to internal validity, also known as ambiguous temporal precedence (Shadish et. al, 2002), is a critical methodological approach for a quasi-experimental design (Creswell & Creswell, 2018; Cook & Steiner, 2010; Martin & Bridgmon, 2012). Internal validity is assessing whether the dependent variables (outcomes) are indeed causal to the manipulated independent variable (treatment) (Creswell & Creswell, 2018). Actions were taken to minimize

all nine threats to internal validity, as defined by Martin & Bridgmon (2012). An inclusion criterion of five items was implemented to recruit a sample for the study.

Forty-three schools met the inclusion criterion and were contacted through an initial recruitment e-mail. Two follow-up e-mails were sent and at the end of the recruitment 10 schools expressed interest to participate in the study. Six schools received written letters of support from their administration. Teachers ( $n = 10$ ) from six schools attended a meeting to discuss the study procedures. Four schools were randomly assigned to the treatment group and two schools to the control group. Each school was considered to be located in a rural community, primarily Caucasian, and farming communities (Kentucky Department of Education, 2016).

A total of 191 freshman students (14-16 years of age) participated in this study. Of this sample, 102 (53.4%) were female students and 89 (46.6%) were male students. A total of 144 (76 female students, 68 male students) students were placed into single-sex classrooms as the treatment group, with the remaining 47 students (26 female students, 21 male students) remained in coeducational classrooms as the control group. No students or parent requested to opt-out of same-sex classrooms. The study followed all protocols, confidentiality, and safety measures approved by the university's Institutional Review Board (IRB).

Students' attendance, behavioral incidents and grades were reported by the school district throughout the 15-week semester. The reasoning behind the absence was not reported and behavioral incidents were school-wide rather than just in the *Principles of Agriculture* course.

The researcher developed a questionnaire that assists in describing teachers' expectancy. The instrument contained six items related to particular dependent variables (academic performance, behavioral incidents, FFA membership, attendance, interest in an agricultural career, and interest in agricultural education). Each item was set to a five-point Likert-scale from 1 (strongly disagree) – 5 (strongly agree) whereas 3 served as neutral. Teachers completed the survey at three points in time: a) three-months prior to the start of school; b) at the start of the class; and c) at the end of the semester. A panel of experts reviewed the questionnaire for face and content validity (Ary et al., 2019). Modifications were made following the expert panel's reviews in order to meet face and content validity. The instrument was deemed acceptable.

Data was inputted into IBM Statistical Package for Social Sciences® (SPSS) for data analysis. The data were organized and cleaned prior to analysis. As recommended by Field (2018), descriptive analyses of the data and examined items for normality (Shapiro-Wilk test) was conducted. A *strict* confidence level ( $\alpha < 0.05$ ) was established for statistical test required in investigating the research objectives.

### Findings

Students' academic performance was measured by the end of semester grade and end of semester GPA (see Table 1). Girls in the treatment group ( $X_{+2}$ ) reported the highest semester grade in the *Principles of Agriculture* course ( $m = 3.53$ ,  $SD = 0.79$ ), followed by boys in the treatment group ( $X_{+1}$ ;  $m = 2.88$ ,  $SD = 1.11$ ). Girls in the treatment group ( $X_{+2}$ ) reported the highest semester GPA in the *Principles of Agriculture* course ( $m = 3.14$ ,  $SD = 0.71$ ), followed by girls in the

control group ( $X_{-2}$ ;  $m = 3.13$ ,  $SD = 0.78$ ), boys in the treatment group ( $X_{+1}$ ;  $m = 2.96$ ,  $SD = 0.68$ ), and boys in the control group ( $X_{-1}$ ;  $m = 2.20$ ,  $SD = 1.05$ ).

Table 1

*Students' Academic Performance of Treatment and Control Groups (n = 191)*

Variable	Treatment (n = 144)						Control (n = 47)					
	Boys (n = 68)			Girls (n = 76)			Boys (n = 21)			Girls (n = 26)		
	M	SD	Range	M	SD	Range	M	SD	Range	M	SD	Range
LG	2.88	1.11	4.00	3.53	.79	4.00	1.90	1.55	4.00	2.86	1.32	4.00
GPA	2.96	.68	3.00	3.14	.71	2.80	2.20	1.05	3.70	3.13	.78	2.70

*Note.* LG = *Principles to Agriculture* Letter Grade; GPA = High School Grade Point Average. LGs were reported as letter grades from A to F. GPAs were reported on a 4.00 scale.

Attendance was measured by the reported full days missed with one semester of each student (see Table 2). Girls in the treatment group ( $X_{+2}$ ) reported the highest percentage of students with perfect attendance or no days missed (30.3%), followed by boys in the treatment group ( $X_{+1}$ ; 10.3%). Girls in the treatment group ( $X_{+2}$ ) had the highest percentage of students who missed five days or less ( $n = 59$ ; 77.7%) followed by boys in the treatment group ( $X_{+1}$ ;  $n = 46$ ; 67.7%).

Table 2

*Students' Attendance and Behavioral Referrals (n = 191)*

Characteristic	Treatment (n = 144)		Control (n = 47)	
	Boys (n = 68)	Girls (n = 76)	Boys (n = 21)	Girls (n = 26)
	f(%)	f(%)	f(%)	f(%)
Days missed				
0	7(10.3)	23(30.3)	0(0.0)	3(11.5)
1 to 5	39(57.4)	36(47.4)	13(62.0)	14(53.8)
6 to 10	15(22.1)	10(13.2)	4(19.0)	10(38.5)
11 to 15	7(10.2)	1(1.3)	2(10.0)	0(0.0)
16 to 20	0(0.0)	4(5.3)	1(5.0)	0(0.0)
21 to 25	0(0.0)	0(0.0)	0(0.0)	0(0.0)
26 to 30	0(0.0)	1(1.3)	1(5.0)	0(0.0)
Behavioral referrals				
0	45(66.1)	64(84.2)	14(66.7)	21(80.7)
1 to 5	19(28.0)	12(15.8)	4(19.0)	4(15.3)
6 to 10	3(4.4)	0(0.0)	3(14.3)	1(4.0)
10 or more	1(1.5)	0(0.0)	0(0.0)	0(0.0)

The minimum number of discipline referrals reported was zero and the maximum number of referrals reported by one student was thirteen. Of the student participants, 84.2% of the girls in the treatment group ( $X_{+2}$ ;  $n = 64$ ) reported the highest percentage of students with no behavioral incidents, followed by of the girls in the control group ( $X_{-2}$ ; 80.7%), boys in the control group ( $X_{-1}$ ; 66.7%), and boys in the treatment group ( $X_{+1}$ ; 66.1%).

Teacher expectations for academic performance had a significant relationship with teacher expectations for referrals ( $r = -.163$ ), for students' interest in an agricultural career ( $r = .278$ ), for students' interest in agricultural education ( $r = .796$ ), and with students' semester grades ( $r = .403$ ). Teacher expectations for behavior had a significant relationship with students' interest in an agricultural career ( $r = -.585$ ) and with students' semester grade ( $r = -.198$ ). Teacher expectations for attendance had a significant relationship with teacher expectations for students' interest in agricultural education ( $r = .197$ ), student's semester grades ( $r = -.285$ ), and with student's semester GPA ( $r = -.164$ ). with teacher expectations for attendance.

Teacher expectations for students' interest in agricultural education had a significant relationship with students' semester grades ( $r = .300$ ) and with students' semester GPA ( $r = .178$ ). Students' semester GPA had a statistically significant ( $p < .05$ ) relationship with the students' interest in an agricultural career ( $r = .172$ ). Spearman's Rho correlations revealed a significant relationship between students' behavior and teacher expectations for academic performance. Student behavior had a significant relationship with students' interest in an agricultural career ( $r_s = .152$ ) and the students' attendance had a significant relationship with their interest in an agricultural career ( $r_s = -.203$ ).

### **Conclusions, Implications, and Recommendations**

The treatment group had higher semester grades for their *Principles to Agriculture* course. Also, the girls ( $X_{+2}$ ) and boys ( $X_{+1}$ ) in the treatment group had a higher high school GPA when compared to their same sex colleagues in the control group ( $X_{-1}$ ;  $X_{-2}$ ). The results imply that across the different school sites, the students in the treatment group had higher academic performance than students in the control group. These findings support the conclusions of Gurian et al., (2009) that single-sex classrooms increase students' academic performance.

Scholars have even classified boys as at risk and disadvantaged (Cook, 2006; Gunzelmann & Connell, 2006; Van Duzer, 2006). The findings indicate that girls had higher academic performance compared to their male counterparts, regardless of treatment. However, the boys in the treatment group ( $X_{+1}$ ) outperformed the boys in the control group ( $X_{-1}$ ). Programs, strategies, and interventions are needed for secondary teachers to improve the academic performance of high school boys. Gurian et al. (2009) argues that single-sex classrooms can allow teachers to give specialized attention to boys which is recorded to improve academic performance; thus, teachers may consider this movement for early entry courses into secondary agriculture.

Interestingly, the treatment group also had the highest percentile of students with perfect attendance compared to the control group. Low school attendance is powerful predictor of high school dropout (Rumberger, 2011; Morris, 2008)). Kearney and Graczyk (2013) posits that reducing anxiety and disruptive behavior in classrooms are ways to increase attendance among secondary students. If this claim is true, then the increased attendance of students in the treatment group may be due to reduced social anxieties (Hart, 2016) and improved classroom management (Dijkstra & Berger, 2018) in same-sex classrooms. Research should examine the effects of single-sex classrooms on secondary student attendance.



The findings helped to further support research conducted by Glock (2016) in which teachers' expectations influence academic performance. Performance expectations also coincided with research from Osborne et al. (2016) that teachers with high expectations gained an increase in student performance and teachers.

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## Personal and Contextual Factors Predicting Agriscience Teaching Self-Efficacy

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### Abstract

*High teaching self-efficacy is vital for the continued success of secondary agriculture education. Agriscience teachers, in particular, face challenges as they adjust to the demand of the profession. Self-efficacy positively impacts instructional efforts and instructors' perseverance in the face of obstacles. Research on self-efficacy beliefs could thus help prepare high efficacy teachers who can exhibit less burnout, more job satisfaction, and professional longevity. The study investigated if mentorship, job satisfaction, burnout, gender, teaching experience, and school context could all contribute to the odds of high teaching self-efficacy among agriscience teachers in Texas. A convenience sample of 122 agriscience teachers from Texas secondary schools was given a quantitative survey via QUALTRICS™. The study used STATA for data analysis and binary logistic regression to answer the research objective. The overall binary logistic model was statistically significant,  $\chi^2(10) = 48.59$ ,  $p < .001$ , McFadden's  $R^2 = .30$ , revealing that teaching experience, personal accomplishment, and job satisfaction were significant predictors of the log odds teachers would express a high level of self-efficacy. Gender had a significant but negative effect. Job satisfaction was an essential aspect of increasing teacher self-efficacy, highlighting the critical nature of developing strategies to improve job satisfaction and retention. Future research should employ mixed methods to understand in-depth the factors that increase or lower self-efficacy among agriscience teachers.*

### Introduction/ Literature Review

Self-efficacy refers to a person's belief in his or her ability to accomplish specific life goals (Bandura & Wessels, 1994). Self-efficacy is an individual's capacity to plan and successfully carry out activities needed to achieve specific types of results within a given context (Bandura, 1986). Bandura and Wessels (1994) contend that people's beliefs affect how they feel, think, motivate, and act. In educational settings, self-efficacy refers to a teacher's capacity to plan, organize, carry out teaching tasks at specified levels within a given school (Bandura, 1997; Tschannen-Moran et al., 1998). Teaching efficacy in the present study operated as a three-construct domain which included student engagement, classroom management, and instructional strategies (Tschannen-Moran et al., 1998; Tschannen-Moran & Hoy, 2001).

Self-efficacy beliefs foster a positive learning environment and promote students' cognitive development in schools (Bandura, 1997). Bandura contended that teachers with a high sense of self-efficacy have confidence in their performance capabilities and can deal effectively with obstacles, including the most challenging students. Teachers with high efficacy report increased job satisfaction, decreased stress (Klassen & Chiu, 2010; Bandura, 1994), superior teaching

quality, and high student achievement (Bandura, 1997; Tschannen-Moran & Hoy, 2007). The converse is true for low self-efficacy teachers (Bandura 1997; Tschannen-Moran & Hoy, 2007). Because these teachers persevere through challenging academic assignments (1977), they exhibit a lower rate of attrition, which saves schools money on hiring and retraining new hires (Darling-Hammond et al., 2002; Judge et al., 1998). Stress impairs teachers' performance, well-being, and overall job satisfaction, causing them to have a pessimistic view of their professions (Chaplain, 2008).

Classroom management, interpersonal relationships, work-life balance, and acclimating to the rigors of the agriscience profession are some of the difficulties encountered in Texas public schools (Agricultural Teachers' Association of Texas [ATAT], 2020). Increased teaching responsibilities and poor student behavior also contribute to teachers' stress and job dissatisfaction (Manthei et al., 1996). Burnout occurs primarily in agriscience due to high job demands and long workdays (Hainline et al., 2015). Agriscience teachers work an additional ten hours per week on top of the standard forty-seven compared to teachers in other disciplines, (Sorensen & McKim, 2014). Consequently, the ATAT Mentoring Program was created to help agriscience teachers overcome professional obstacles (ATAT, 2020). (ATAT, 2020). The management of a comprehensive FFA program, livestock exhibitions, and booster club activities such as competitive leadership and judging presents a greater challenge to novices (Murray et al., 2011).

Instructors may doubt their self-efficacy during the initial years of teaching, prompting them to resign or stay in their jobs (Siwatu, 2011). Among the previously identified factors leading to teacher attrition (Hasselquist et al., 2017; Pas et al., 2012; Strong, 2005), Roberts and Dyer (2004) identify stress as the top cause. Most newly hired teachers in Texas public schools resign within two years (ATAT, 2020), with over half leaving within the first seven years, primarily due to burnout (Jepson & Forrest, 2006). Some scholars purport that mentoring is the antidote to teacher shortages and attrition (Darling-Hammond, 2003; Ingersoll & Kralik, 2004; Walker et al., 2002). Mentorship grants teachers the skills, knowledge, and self-efficacy necessary to succeed or thrive in high-stake situations (Yost, 2002; ATAT, 2020). Meanwhile, self-efficacy expectation is a critical tool for coping with job stress and conflict (Schwarzer, 2014).

Studying predictors of teachers' self-efficacy beliefs and how this relates to decisions to remain or leave the profession may aid teacher preparation and retention efforts. (Blackburn & Robinson, 2008; Tschannen-Moran et al., 1998). Current debates also underscore the critical nature of preparatory programs identifying and addressing emerging issues in agriculture education through curricular activities and experiences (Roberts et al., 2020).

### **Theoretical and Conceptual Frameworks**

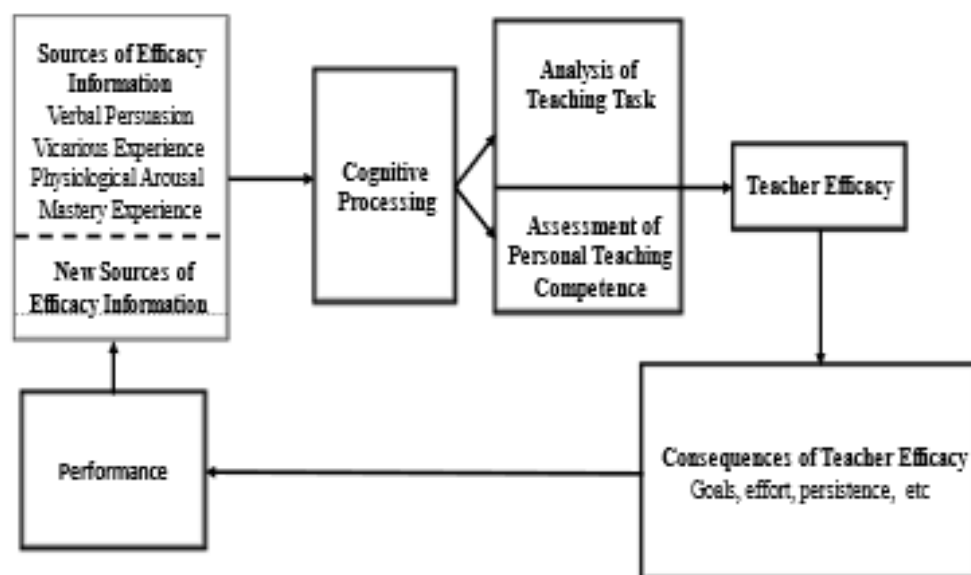
Social cognitive theory of self-efficacy (Bandura, 1986, 1997) and the cyclical nature teacher efficacy model (Tschannen-Moran et al., 1998) informed this study. The social cognitive theory postulates that actions depend on a sequence of personal, social, and environmental variables (Bandura, 1986). Bandura (1999) asserts that people contribute to their "...motivation, behavior, and development within a network of influences that... reciprocate" (p. 169). The social cognitive theory supports an agent-like view towards embracing and bringing about personal growth (see

Bandura, 2005). Self-efficacy, a subset of the social cognitive theory (Bandura, 1997, p. 79), is emulated in propositional beliefs and rooted in multiple purposeful relationships that reciprocate to influence distinct realities (Bandura, 1997).

The cyclical nature of the teacher efficacy model (Figure 1), emulating the social cognitive theory of self-efficacy (Tschannen-Moran et al., 1998), postulates that teachers evaluate their personal strengths and weaknesses before performing tasks and, in the process, judge their teaching efficacy levels. The four primary efficacy sources (Tschannen-Moran et al., 1998) influence task analysis and self-perceived teaching competence; however, their impact was beyond this study. Personal, social, and situational factors also influence the relevance of the four sources, as depicted in Figure 1. Consequently, teachers perceive their performance as more or less proficient depending on the type of information source (Tschannen-Moran et al., 1998). Mastery experience is, however, the most impactful efficacy source followed by vicarious experience (Capa-Aydin et al., 2018; Loo & Choy, 2013; Oyugi, 2021; Usher & Pajares, 2006)

**Figure 1**

*A Model of the Cyclical Nature of Teacher Efficacy*



The conceptual framework for the present study postulated that teacher traits and contextual factors contribute significantly to the odds of observing high or low teaching self-efficacy among agriscience teachers.

### **Purpose/Objectives**

The purpose of this study was to determine if gender, teaching experience, school context, mentorship status, burnout sense, and job satisfaction significantly predicted a high level of agriscience teachers' teaching self-efficacy.

**RO:** Determine if a high level of agriscience teaching self-efficacy can be predicted by mentorship, job satisfaction, burnout, gender, teaching experience, and school context.

## Methods

A convenience sample of 122 agriscience teachers from Texas secondary schools was studied using a non-experimental cross-sectional predictive survey design (Johnson, 2001). After obtaining Texas Tech IRB approval, the respondents took the survey online through Qualtrics™ (Dillman et al., 2014). The instruments were previously found valid and reliable but were further pre-tested and piloted with agriscience teachers in other states apart from Texas to ensure their validity and reliability in the study context. Post hoc reliability tests yielded Cronbach's alpha coefficients well within acceptable levels of .70 for basic research (Nunally, 1978).

The instrument had one dependent variable, self-efficacy, measured using the short version of the Teachers' Self-Efficacy Scale (TSES) by Tschannen-Moran et al. (2001). TSES contained twelve self-efficacy items and were measured on a nine-point scale cannot do at all (1) to highly certain can do (9). The items represent the three teaching self-efficacy constructs: classroom management, student engagement, and classroom instruction. Teaching Self-efficacy was an index (self-efficacy index) computed from a weighted average of all the twelve items on TSES. The weighted index was binned to make it a two-level nominal variable with low teaching self-efficacy (0) and high teaching self-efficacy (1). The participants who scored seven counted as low teaching self-efficacy, while those who scored seven were high teaching self-efficacy category.

The six independent variables included mentorship status, a three-level nominal variable denoted as mentored (0), non-ATAT mentored (1), and ATAT mentored (2). Burnout was second with twenty-two statements, each measured on a scale of never (0) to every day (6) using the MBI for Educators Survey (Maslach & Jackson, 1981). The constructs of personal accomplishment (PAC), emotional exhaustion (EEX), and depersonalization (DEP) categorically represented burnout. Job satisfaction was an average of five statements, each rated on a scale of strongly disagree (0) to strongly agree (10) Judge et al.'s (1998) recommendations. Teaching experience was ratio level quantified as the total number of years spent in the classroom. Finally, school context was a three categorical variable with urban (0), suburban (1), and rural (2). Likewise, gender was measured using male (0) and female (1).

To determine the likelihood of high versus low teaching self-efficacy among Texas agriscience as a result of mentorship, job satisfaction, burnout, gender, school context, and teaching experience, a binary logistic regression was applied with the logit transformation:

$$\eta = \text{logit}(\pi) = \log\left(\frac{\pi}{1-\pi}\right). \quad (1)$$

By fitting a linear model of the so-called *propensity*  $\eta$ , binary logistic regression predicts membership in only two categories [0,1] in this study (e.g., Agresti, 2003; Field, 2018). This propensity is a transformation of the probability  $\pi = \Pr(y = 1)$ . The logistic regression aims at finding parameter estimates ( $\beta_s$ ) that best fit

$$\eta_i = \beta_0 + \sum_{s=1}^K x_{si}\beta_s + \varepsilon_i, \quad (2)$$

where  $\beta_0$  is the estimated value of the propensity  $\eta_i$  when all predictors are valued at zero. Unlike ordinary regression, the  $\beta_s$  parameters require maximum likelihood estimation instead. Once

estimates for  $\eta_i$  are computed, the probability of a “success” ( $y_i = 1$ ) for any given individual can be estimated by applying the inverse logit:

$$\hat{\pi}_i = \text{logit}^{-1}(\hat{\eta}_i) = \frac{\exp(\hat{\eta}_i)}{1 + \exp(\hat{\eta}_i)}. \quad (3)$$

Finally, a simple approach to estimate outcomes for  $Y$  (self-efficacy) is to let  $\hat{y}_i = \text{round}(\hat{\pi}_i)$ .

The logistic model applied was

$$\text{logit}(\hat{\pi}_i) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} \dots + \beta_{ni} X_{ni} + \varepsilon, \quad (4)$$

The estimated model for teaching self-efficacy was:

$$\text{logit}(\text{BinnedSEI}) = \beta_0 + \beta_1 \text{Gender} + \beta_2 \text{Experience} + \beta_3 \text{School Context} + \beta_4 \text{Mentorship} + \beta_5 \text{Burnout} + \beta_6 \text{Burnout} + \beta_7 \text{Burnout} + \beta_8 \text{Job Satisfaction} + \varepsilon, \quad (5)$$

Multicollinearity was examined between each pair of predictor variables as a standard procedure for determining the validity of binary logistic regression. All predictors had VIFs values were sufficiently below the maximum limit (Menard, 2010).

## Results/Findings

Female ( $n = 64$ , 52.46%) respondents constituted more than half of the sample ( $N = 122$ ). The remainder ( $n = 56$ , 45.90%) were males. The majority of respondents ( $n = 110$ , 90.1%) were White, followed by Black/African Americans ( $n = 2$ , 1.94 percent) and Asians ( $n = 1$ , 0.82%). The remainder ( $n = 9$ , 7.38%) provided no information about their races. Most teachers ( $n = 66$ , 54.1%) attended rural schools, with the remainder attending suburban ( $n = 37$ , 30%) and urban ( $n = 19$ , 15.5%) schools. A sizable proportion of the teachers ( $n = 56$ , 47.1%) were not mentored, slightly more than a quarter had been mentored through ATAT ( $n = 37$ , 31.1%), and the remaining quarter ( $n = 26$ , 21.9%) had been mentored through some other mentorship program.

Software for Statistics and Data Science (STATA) was used to determine which independent variables contributed to the likelihood of observing high or low levels of teaching self-efficacy among agriscience teachers. The overall logistic model was significant at 0.05 alpha level set *a priori*,  $\chi^2(10) = 48.59$ ,  $p < .001$  (Table 1). Model fitness was quantified using McFadden's  $R^2$ , with values greater than 0.20, indicating models with the excellent fit (Pituch & Stevens, 2015). McFadden's  $R^2$  value for the current study model was 0.30.

Except for gender that had a negative effect, three statistically significant variables all contributed to the log odds of teachers having high teaching self-efficacy (Table 1). The unstandardized beta coefficient of gender was statistically significant and negative,  $B = -1.23$ ,  $OR = 0.29$ ,  $p = .035$ , indicating the probability (odds) of observing high levels of teaching self-efficacy would decrease by approximately 71% for male teachers. The predictive effect of teaching experience,  $B = 0.09$ ,  $OR = 1.09$ ,  $p = .003$ , indicated that for every additional year of teaching, the probability (odds) of observing high teaching self-efficacy among teachers would increase by approximately 9%. Likewise, the personal accomplishment was statistically significant,  $B = 1.34$ ,  $OR = 3.83$ ,  $p = .001$ , indicating that the probability (odds) of observing high teaching self-efficacy among teachers would increase by approximately 283% for every unit increase in personal accomplishment. Also, job satisfaction was statistically significant,  $B = 0.32$ ,  $OR = 1.38$ ,  $p = .006$ , indicating that the probability (odds) of observing high teaching self-efficacy among teachers would increase by approximately 38% for a unit increase in job satisfaction. See Table 1 for more information.



**Table 1**

*Predicting Agriscience Teaching Self-Efficacy from Teacher Factors, Mentorship Status, Burnout, and Job-satisfaction*

Independent Variables	<i>B</i>	<i>SE</i>	$\chi^2$	<i>p</i>	<i>OR</i>	95% CI
(Intercept)	-6.36	2.24	8.02	.005	-	-
Gender- male	-1.23	0.58	4.46	.035	0.29	[0.09, 0.92]
Teaching experience	0.09	0.03	8.71	.003	1.09	[1.03, 1.15]
School- suburban	-1.07	0.84	1.61	.204	0.34	[0.07, 1.79]
School- rural	-1.40	0.81	2.97	.085	0.25	[0.05, 1.21]
Non-ATAT mentored	-0.78	0.64	1.47	.225	0.46	[0.13, 1.61]
ATAT mentored	-0.02	0.57	0.00	.973	0.98	[0.32, 2.97]
Burnout- PAC	1.34	0.42	10.28	.001	3.83	[1.68, 8.69]
Burnout- DEP	-0.37	0.34	1.17	.279	0.69	[0.35, 1.35]
Burnout- EEX	-0.11	0.27	0.17	.683	0.90	[0.53, 1.52]
Job satisfaction	0.32	0.12	7.64	.006	1.38	[1.10, 1.73]

*Note.*  $N = 122$ .  $\chi^2(10) = 48.59$ ,  $p < .001$ , McFadden  $R^2 = 0.30$ .

### Conclusions and Recommendations

Four of the six variables significantly predicted agriscience teaching self-efficacy. Male teachers were less likely to have high levels of self-efficacy than their female counterparts, raising the question of why male teachers self-reported low teaching self-efficacy. The significant effect of teaching experience agreed with Siwatu (2011), who established that teachers with less experience exhibited low levels of teaching self-efficacy. Contrary to Felicia (2005), the school context did not affect teaching self-efficacy. The effect of mentorship on teaching self-efficacy contradicted other studies that found a positive relationship (Chizhik et al., 2018; LoCasale-Crouch et al., 2012). Personal accomplishment was the only significant burnout variable and its coefficient implied that decreasing its levels would increase burnout and reduce self-efficacy, and may potentially cause teacher attrition (Hakanen et al., 2006; Leung & Lee., 2006). Job satisfaction increased teaching self-efficacy in agreement with some scholars (Caprara et al., 2006; Kasalak & Dayar, 2020) and highlighted the need to develop more strategies to increase job satisfaction and retention of the studied teachers in Texas schools. Future research should employ various methods, especially qualitative methods, to explore further how the studied variables contributed to self-efficacy in agriscience teaching. As most teachers may report inflated beliefs, a longitudinal survey and experimental designs or psychophysiological tools could help ascertain realistic levels of self-efficacy among the agriscience teachers. An  $R^2$  of 0.20 indicates an excellently fitted logistic model (Louviere et al., 2000). Since there is no agreement on one particular method to analyze the relationship between self-efficacy and its' associated variables (Skaalvic & Skaalvic, 2010), the  $R^2$  value of 0.30 in this study indicated an excellent model that should be tested further with more teachers, different samples, or predictor variables.

### Limitations of the Study

The present study involved a convenience sample of all agriscience teachers in Texas high schools who consented to take part. Researchers should thus replicate the study with additional teachers and states to enhance generalization of the findings across USA.

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**Defining Programmatic Balance: A Modified Delphi Study**

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Discipline Area: Teacher Preparation

## **Defining Programmatic Balance: A Modified Delphi Study**

### **Introduction and Purpose**

This project was part of larger study exploring the idea of programmatic balance, perceptions of actual and ideal balance, and sources of influence on balance in school based agricultural education (SBAE) programs. We were interested in looking beyond the idea of work-life balance and drilling down into work-work balance (how SBAE teachers balance the different elements of work responsibilities) and the concept of programmatic balance as a whole. Within agricultural education, research has focused on balancing work and “life” elements, an inability of teachers to feel efficacious in balancing all the perceived requirements of teaching, and the impacts of the imbalance on attrition. (Blackburn, et al. 2017; Murray, et al., 2011; Rowland, 2016; Sorenson, et al., 2016). However, in examining the literature, it was noted a definition of programmatic balance was missing and a deficiency. The overarching purpose of this study was to draft a preliminary definition of what constitutes a “balanced program” or what “programmatic balance” may be to initiate and foster scholarly discussion. To address this purpose, the research questions guiding this study were:

RQ1: What are the elements of balanced secondary school based agricultural education programs as identified by a panel of experts?

RQ2: How do experts in agricultural education define programmatic balance?

### **Review of Literature and Theoretical Framework**

Ajzen’s Theory of Planned Behavior (TPB) served as the theoretical underpinning for this study. TPB suggests that an individual’s actions are preceded by intentions to act. (Ajzen, 1991; 2002). These attitudes are shaped by individualized beliefs regarding potential to complete the task (self-efficacy), peer influence on views regarding the activity (vicarious experiences), and perceptions of control within the system of executing the behavior (Ajzen, 2006). While this study did not test changes in planned behavior or TPB, the need to define programmatic balance and TPB are still connected. If an operationally defined idea of “programmatic balance” is not part of the language or planning process for an agricultural educator two of the three elements of the TPB are non-existent. If behavioral intentions are predicated by personal and subjective group norms there can be no expectations for a change in behavior until the opportunity is provided to reflect on the idea of balancing the elements of a program by first creating a definition.

### **Methods**

An adaptation of the Delphi method was employed to address the research questions. A Delphi study has three specific features: anonymous response, controlled and iterative feedback, and statistical group response aggregation through multiple rounds of data collection (Dalkey, 1969; Geist 2010; Linstone & Turoff, 2002). A key structure in the use of Delphi techniques is accessing input from a panel of experts (Hsu & Sanford, 2007). The panel for this study were members of the National Association of Supervisors of Agricultural Education (NASAE), a national professional organization of state directors, executive secretaries, and other state FFA

leadership personnel. Access to the NASAE membership was provided by facilitated use of the organization's listserv. These limitations prevented the selection of specific participants and dictated that the expert panel consist of all ( $N = 168$ ) email addresses on the list-serv.

The first round is characterized by brief surveys that utilized open-ended questions (Warner, 2017). An instrument was developed and revised containing two questions. The first question was a demographic question regarding job title and the second, an open-ended question written to elicit input on programmatic balance: In light of the three-circle model of agricultural education; how do you define a balanced agricultural education program in terms of classroom instruction, FFA, SAE, or other programmatic activities?

Following first round data collection, coding began using a combination of holistic, structural, and *in vivo* methods (Saldana, 2013). In the case of this study, the *a priori* expectations were on programmatic balance and extraneous comments were excluded. When possible, direct quotes were used in the coding process. Second cycle data analysis was performed using pattern coding techniques to coordinate initial codes into major themes.

The original 99 codes were collapsed into 36 prompts and, after expert review and feedback, four prompts were removed for being redundant to existing questions. The final questionnaire for the second round contained one demographic question and 32 statements for the panel member's response. First round consensus levels were set *a priori* with any item with a mean agreement score of greater than five or where more than 83% of the respondents indicated some level of agreement, were deemed to be in immediate consensus. Any items where at least 50% of the respondents indicated any level of agreement were used to generate the round three instrument and items failing to reach the 50% agreement threshold were removed from consideration.

Results from the third round were compiled with round-two data and a statement was synthesized to answer the research questions. To account for having to use an intermediary person and inability to access a specific panel in all three rounds, a *post hoc* step was utilized to only include responses in round two from those who also responded to round three.

### Results

The round one instrument generated a total of 41 complete responses. In the subsequent re-reads, eight themes emerged. An additional area called "other" was created to house the five additional statements that merited consideration but did not have similar statements from other participants. Out of the original 99 codes, further data analysis yielded 36 statements under the nine sections. These statements or sections were utilized to generate the round two instrument. The instrument was placed under further scrutiny for overlap and similarity and reduced to 32 prompts.

In the second round, any respondent who responded to at least one of the prompts were retained for data analysis, resulting in 69 NASAE members responding to the instrument. Dalkey (1969, 2002) suggests that a panel of 13 is large enough for a reliability level of 0.9.

Levels of agreement for consensus in the second round were set *a priori*. Items receiving a mean score of five or higher ( $n = 11$ ), or where 83% of the respondents indicated some level of



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agreement ( $n = 4$ ), were considered to have met group consensus (Table 1). Items not meeting this threshold were analyzed for frequency and percentage of responses. Not all participants responded to each prompt. As a result, the percentage was calculated by summing all responses in the “Agree” category (slightly agree, agree, strongly agree) and dividing by the number of respondents to the prompt. Items where 50% of the respondents indicated some level of agreement ( $n = 9$ ) were retained for the round three instrument.

For abstract brevity, the table including those statements was omitted from this writing. Items where less than 50% of respondents indicated agreement ( $n = 8$ ) were considered rejected by the group.

Table 1  
*Round-One Statements Reaching Immediate Consensus*

Statement (Prompt) from Round One ( $n =$ <i>number of respondents</i> )	% Agreement	<i>M</i> <i>Agreement</i>	<i>SD</i>
Student SAE projects should be based on what the student is interested in and not just what is easiest for the advisor or school. ( $n = 69$ )	100.0	5.54	.59
There needs to be evidence recorded of student work-based learning. ( $n = 69$ )	100.0	5.51	.59
Classroom instruction should include field or laboratory/shop components. ( $n = 69$ )	100.0	5.48	.61
Exemplary programs work to strengthen, not only, their classroom instruction, FFA, and SAE components, but also their program marketing, partnerships, program planning, and professional growth. ( $n = 69$ )	96.8	5.33	.84
Personal and leadership development can be developed in many ways including the classroom, shop, or through community engagement. ( $n = 69$ )	100.0	5.30	.63
Programs are seen as “successful” if they have proficiency winners, frequent state officers, or numerous fair/show projects each year, but a truly successful program is where students are enrolled in agricultural education courses each year, have SAE projects that they work on outside of class, and are involved in the FFA at least at the local level. ( $n = 69$ )	96.8	5.25	.85
Placing equal importance to classroom instruction, FFA, and SAE is essential to having a successful agricultural education program. ( $n = 69$ )	86.8	5.12	1.35

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Instruction needs to be relevant to the student and the needs of the community. ( $n = 69$ )	100.0	5.11	.65
Teachers should not just teach the “contest kids”. If there is not value in teaching the concepts of the CDE to all students, perhaps the CDE is irrelevant. ( $n = 69$ )	93.7	5.10	.92
A program should equally incorporate all elements of the three-circle model. ( $n = 69$ )	87.0	5.06	1.34
Chapters need to have monthly meetings, functioning committees, and be engaged in service to the community. Competitions and contests should not take precedence over the aforementioned. ( $n = 69$ )	90.5	5.02	.95
Students and student leadership opportunities need to engage the community. ( $n = 63$ )	100.0	4.95	.59
The goals and balance of the program should be based on input from the community. ( $n = 63$ )	95.2	4.68	.81
FFA and SAE Programs should grow out of what is taught in the classroom. ( $n = 64$ )	87.5	4.67	1.05
A portion of the student’s grade should be based on FFA involvement and completing and SAE project. ( $n = 63$ )	87.3	4.70	1.12

Likert-Type Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree.

The third-round instrument was written, reviewed and distributed using the same methods as previous rounds with an initial email and two additional reminder emails at one-week intervals. Twenty-three NASAE members responded to the third round. Although this response rate is roughly half of round one and one third of round two, it is still greater than the 13 recommended by Dalkey (1969; 2002) to considered reliable at a .9 level. The instrument contained nine prompts carried over from round two for consideration. Six of the nine statements failed to reach the consensus level set. Of the three that did reach consensus, a commonality emerged in the idea of the classroom being a foundational or central element of the program (Table 2).

Table 2  
*Round Three Statements Meeting Consensus*

Statement from Rounds One and Two (Prompt)	<i>N</i> Respondents	<i>f</i> Agree	% Agree
The classroom is where it all starts. Without which, the other two circles don’t exist.	22	21	95.5

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The classroom is the foundation of the other two elements. SAE programs should be built on what has been presented in class and the interests of students. FFA is used to support the other two areas.

23 21 91.30

Too many programs try to build it backwards and create a strong FFA first, when the classroom focus should be the priority.

21 18 85.7

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From a methodological standpoint, we were concerned about the change in respondent numbers between rounds two and three. To address this, a *post-hoc* analysis was run where only responses from round-three respondents were calculated in round-two prompts. All items meeting consensus in the initial analysis met consensus in the *post-hoc* round. The only difference was the statement “10% of a student’s grade should be based on their consistent work on SAE and another 10% on FFA activities” which was rejected earlier in the *post-hoc* analysis.

### Conclusions, Implications, and Recommendations

The first research question sought to identify what elements should be included in a balanced SBAE program. Most feedback was linked to existing elements of the three-circle model: SAE, FFA, and classroom instruction. Regarding SAE activities, comments and consensus centered around the idea that individual SAE activities should stem from the interests of the students and be an extension of what is taught in the classroom.

Most of the items reaching consensus on FFA and leadership development focused on local engagement and participation. One of the statements reaching immediate consensus in the first round indicated that a successful program is one where students are enrolled in an agricultural course every year, have SAE projects, and are active in the FFA at the chapter level. The local focus of the chapter was echoed in a statement that read “Chapters need to have monthly meetings, functioning committees, and be engaged in service to community” and further indicated that competitions should not take precedence over this local engagement. Focus on local efforts included leadership development opportunities which should be presented in classrooms, laboratories, shops, and the local community. The panel also agreed, evidence of FFA and SAE activities needs to be recorded by the student and included in the grading process.

Three prompts reaching consensus focused on classroom instruction in isolation. The prompts generated and agreed upon by the group included the ideas that classroom instruction should be relevant to the students, based on the needs of the community, and include field, laboratory, or shop elements. Most classroom related prompts reaching consensus centered around the relationship between classroom instruction, SAE, and FFA. Although agreement was met on two prompts indicating equal importance of all three elements or that “a program should equally incorporate all elements of the three-circle model”, more prompts met consensus indicating that FFA and SAE should stem from what is taught in the classroom, that the classroom is the foundation of FFA and SAE activities, and that focus needs to be placed on classroom instruction in order to develop a “strong” program. An additional prompt tied classroom instruction to FFA activities in a cautionary manner. It read “Teachers should not just teach the “contest kids”. If

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there is not value in teaching the concepts of the CDE to all students, perhaps the CDE is irrelevant.”

The second research question aimed to create a definition of a balance program based on the input of the expert panel. From the three rounds of the study, the researcher compiled the following definition:

A balanced SBAE program is one where:

The classroom is the foundation of the program, and should be driven by the needs of the community, the interest of the students, and include field, laboratory and/or shop activities,

Equal importance is placed on FFA and SAE engagement for all students and where those (FFA and SAE) opportunities are relevant to the students, build from what is taught, and evidence of activities are included in the overall performance evaluation of the student, and where

Leadership and career development are not exclusive to formal FFA functions and opportunities exist in classroom, lab, and in the community.

The panel indicated classroom and curriculum should be the foundation of both SAE and FFA activities with equal emphasis placed on all three areas. These recommendations seemingly conflict and raise more questions than they answer. Specifically, how can there be equal focus and emphasis of the three areas if one is foundational and the other two are offshoots of the first? Is the current model of three equal and overlapping circles truly representative of how a program is supposed to operate or if the current Venn-type diagram is more fitting to represent what a student may experience. The findings and definition need to be presented to teaching professionals, teacher-preparation faculty, organizational leadership, and students of agricultural education for qualitative and quantitative exploration.

The findings indicated that all elements of the program, particularly classroom instruction, need to be based on the needs of the community. The use of advisory committees may provide a source of community and industry connection. Further research and clarification are needed regarding methods of surveying and implementing community input and interaction with administrative or legislative forces. Additionally, a needs assessment should be performed to determine what supports can be provided for new or current SBAE teachers in community and programmatic need areas.

This study also identified the need for localized focus for leadership, career development, and engagement. The responses regarding a need to provide localized opportunities suggests an area of importance and, perhaps concern. Further study on how leadership and professional development opportunities are provided is recommended. As an initial study in this line of research, it is not surprising to have generated more questions than definitive answers. Research on the subject is encouraged for all regions to develop a national picture of programmatic balance, potential imbalance, and curb potential negative outcomes from imbalanced programs. Finally, we recognize the definition provided is sourced from the respondents. We offer this manuscript, and the definition it offers an impetus for professional conversation.

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COMPLETED PROJECT; TEACHER PREPARATION; Early Career Struggles with ELL/ESL Stakeholders in SBAE

**Early Career Teachers' Struggles with ELL/ESL Stakeholders in SBAE: A Phenomenological Investigation**

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## **Early Career Teachers' Struggles with ELL/ESL Stakeholders in SBAE: A Phenomenological Investigation**

### **Introduction**

Fifteen percent of teachers abandon the profession within the first year of teaching, and within the first three years, a quarter of teachers will leave the profession (Odell & Ferraro, 1992; Ingersoll & Smith, 2003). Additionally, it is estimated that 41% of educators abandon their teaching career within the first five years of teaching (Solomonson et. al., 2019). From 1978-1988 the average years of experience a teacher held was 15, in 2011-2012 that average sharply dropped to only five years of experience (Ingersoll, Merrill, & Stuckey, 2014). Teachers who leave the profession are overwhelmed, struggle with feelings of being ineffective, and are unsupported (Ingersoll & Smith, 2003; Smith & Ingersoll, 2004).

Enrollment in teacher preparation programs has dropped 35% in recent years (Lynch, 2018). However, researchers are identifying the teacher shortage issue as not just one of recruiting teachers and future teachers but of retaining teachers already in the classroom (Ingersoll & Smith, 2004). Ingersoll and Strong (2011) describe the situation as a revolving door and the real crisis this causes is an absence of teaching quality. Garcia and Weiss note the teacher shortage makes it more difficult to build a solid reputation for teaching, contributing to low teacher retention and perpetuating a cycle of teacher shortage (2019).

Recognizing the role higher education plays in the recruitment, preparation, and retention of teachers coupled with the goal of strengthening teacher preparation programs, the Notice of Final Rulemaking (NFR) for the Teacher Preparation Regulations was developed by the United States Department of Education in October of 2016. The notice was aimed at ensuring early career teachers were ready and able to be successful in the classroom (Teacher Preparation Issues, 2016). NFR encourages rigorous and diverse teacher preparation programs in order to produce new teachers with better preparation in skills and knowledge needed as a teacher, promoting new reporting in relation to program effectiveness' continuous improvement efforts at facilitating ongoing communication among teacher preparation programs, potential teachers, school districts, and other stakeholders such as the state and the public (U.S. Department of Education, 2020).

### **Purpose and Objectives**

The chronic teacher shortage coupled with the recommendations of the NFR gives rise to the need for this study. In order to decrease SBAE teacher attrition rates an examination preparation program is needed. With this in mind, faculty at Texas A&M University-Commerce (TAMUC) chose to turn a critical eye on their own program in agricultural education. The purpose of this phenomenological study was to investigate the undergraduate experiences of alumni at TAMUC and to examine how those pre-service teacher experiences influenced the participants' early career teacher experiences. The research questions guiding this study were:

1. What were the lived experiences of alumni of the agricultural education teacher certification program at Texas A&M University-Commerce?
2. How have those lived, pre-service experiences influenced their early career teaching experience?



## COMPLETED PROJECT; TEACHER PREPARATION; Early Career Struggles with ELL/ESL Stakeholders in SBAE

This was open-ended research study investigating the impacts of the teacher preparation program at TAMUC. The theme and ideas surrounding ESL/ELL stakeholders emerged from the shared experiences of all study participants.

We felt the struggles shared by participants was powerful, concerning, and warranted its own specific discussion.

### **Review of Literature and Theoretical Framework**

Early career teachers, defined as teachers within their first three years of teaching (McCurdy, 2016), frequently embrace idealistic outlooks in reference to their careers (Rust, 1994). They quickly encounter the many challenges of educational reality which include: managing a classroom, high student-to-teacher ratios, lack of self-efficacy, and lack of curriculum guidance (Hong, 2012; Kauffman, Johnson, Kardos, Liu, & Peske, 2002; Manassero, et al., 2006). The struggles of early career teachers can cause them to burnout which increases a teacher's likelihood of leaving the profession (Gavish & Friedman, 2010, & Skaalvik & Skaalvik, 2010).

While acknowledging the struggles many early career teachers face, teaching agricultural science is even more challenging when considering the multifaceted roles of an agricultural educator (Roberts & Dyer, 2004). Agricultural teachers have a number of roles and responsibilities extending beyond the classroom including being a school/district team member, planning and developing a program of instruction, preparing to teach class, delivering instruction, evaluating student progress, advising student leadership organizations, supervising student experiences, managing resources, relating to the public, and practicing citizenship (Talbert et. al., 2007). Undoubtedly, understanding job satisfaction, stress, and burnout associated with agricultural education roles and responsibility enables teacher educators to better prepare future teachers and to assist those already in the profession (Kitchel et al., 2012).

Early career teachers experience a transition from student to professional that is often challenging for the individual to make in terms of self-perception and identification. Early career teachers often struggle with their roles, reconciling idealistic images of education with reality and alternating between authoritarian and nurturing roles as they attempt to become a teacher (McCurdy, 2016). According to Schlossberg (1981), a transition takes place when a change in assumption and expectations about one's self and the world occurs. The transitional stage is marked with both relational and personal changes, affecting both personal and professional "selves" and includes an early career teacher's ability to handle distress, strain, exhaustion, and find additional sources of support (Schlossberg, 1981). An individual will remain in transition until a stable organization of perception is established (Schlossberg, 1981).

The theoretical underpinning of this study was a convergence of the human capital theory (HCT), self-efficacy theory (SET), and social cognitive theory (SCT). HCT posits individuals are capable of being developed (Haynes, Gill, Chumbley, & Slater, 2014). This development can occur through education, skills, experiences, and training. Investments in an individual, such as comprehensive undergraduate instruction, job placement assistance, and opportunities for professional development, are positive methods for creating self-efficacy and inspiring growth and professional advancement (Haynes et al., 2014). Additionally, these opportunities provide a

benefit to potentially decreasing teacher attrition rates (Haynes et al., 2014). Furthermore, teacher preparation programs have the opportunity to develop human capital in their students via courses and experiences designed to benefit those students in their careers (Haynes et al., 2014).

According to Bandura (1986), self-efficacy is one's personal perceptions concerning their ability to plan and carry out certain activities. As such, effective teaching is related to a teacher's own perceptions of their ability to teach or self-efficacy (Eck et. al., 2019). Effective teaching is related to a teacher's own perceptions of their ability to teach i.e., self-efficacy (Haynes et al., 2014). Social cognitive theory postulates that an individual's acquisition of knowledge is directly related to the observation of others through social interactions and experiences (Bandura, 2005; Frost, 2019). Therefore, the student teaching and early career educator experiences can be improved even through an indirect positive experience (Bandura, 1977). Skill mastery and indirect experiences help develop behavioral beliefs that become personal attitudes towards the behavior (Ajzen, 2006).

Philosophically speaking, experiences shape an individual's long-term development and guide future growth (Dewey, 1938). This is reflected in an important part of pre-service agriculture teacher preparation through the student teaching experience. This career preparation activity is often the capstone experience to undergraduate agricultural education curriculum based in experiential learning. This study examined how undergraduate experiences, using SCT, influence early career teachers' self-efficacy. Information from this study will provide additional information on how teacher preparation programs can better develop human capital during the pre-service training process.

## Methods

A phenomenological approach was chosen to capture a first-hand account of the lived experiences of those who participated in the agricultural education certification program at TAMUC and describe how those experiences shaped their early career teaching experiences. Phenomenology is particularly effective at detailing feelings and experiences which can be explored to better describe, communicate, and interpret (Grbich, 2007). In this study, the shared experiences are the experiences participants had as students in the agricultural education teacher certification program as well as the experience through the early career phase of teaching

A purposive sampling technique was utilized to select participants to attain a sample where both a depth and diversity of perspectives would be offered (Creswell, 2013) and where selected participants would be able to offer information important to the phenomenon being studied (Maxwell, 2005). Criterion used to select research participants included the traits: over the age of 18, an early career secondary agricultural science teacher employed at a school district in [State], and certified to teach agricultural science through TAMUC. Five participants were identified and interviewed. Creswell (2013) stated a sampling of between three and 14 was appropriate for phenomenological because a phenomenon was often experienced in a small group.

Data were collected using two semi-structured interviews as the primary source. (Moustakas, 1994). The questions posed during the interview were open-ended and developed from prior research of the Standards for School-Based Agricultural Education Teacher Preparation

Programs (SSBAE-TPP) from the American Association for Agricultural Education (AAAE), National Council for Agricultural Education (NCAE), also referred to as The Council (Council, 2012a), and [State] education standards. The second round of interviews were designed to mirror the first in addition to requesting that the participants reflect on and answer follow-up questions from the first interview. The researcher used this interview to check for understanding using statements such as, “this is what I heard you say...is this correct,” allowing the participant the flexibility to elaborate on responses and provide clarification to an experience. The second set of interview questions served to further examine emerging themes.

Interviews were conducted face-to-face and/or virtually via Zoom, approximately 90 minutes in length, digitally recorded, transcribed verbatim, and provided to the participant for review for member checking. A reflective journal was used during the interview process concerning the spoken communication, non-spoken communication, and general nature of the participants. One-page summaries were written after each interview detailing significant information about the participant and observations.

Transcripts were de-identified and pseudonyms were assigned to each participant before data analysis began. Data files were manually reviewed to provide more “ownership and control” as recommended by (Saldaña, 2013 p. 26). Iterative rounds of analysis included an initial read and re-read followed by deductive, holistic, and pattern coding methods (Christians & Carey, 1989 and Saldaña, 2013). Following the development of themes and codes, de-identified transcripts were provided to a colleague with qualitative experience as an independent cross-checked to minimize potential researcher bias and improve credibility. Following this, a final round of *in vivo coding* was utilized to add richness to the details of codes.

## Results

Although multiple themes emerged, this abstract focuses on only one part of a larger body: the struggle of working with ESL students and non-English speaking stakeholders. All participants described a lack of understanding and confidence in working with this population of specifically, Spanish speaking individuals particularly through the lens of feeling inadequately prepared to best serve them in a classroom setting. Bonnie shared her struggles and stated,

I have a Hispanic kid that has no understanding of English, none, and I don't know any Spanish, and they send them in here on a daily basis with no translator, and I have to translate every paper into Spanish, give it to him, and he answers in Spanish. Then I have to translate it back to English, and so it's a lot of preparation that I guess I didn't realize how much I would be responsible for without help from the district.

Bonnie stated she was able to bridge the gap by learning to translate Google slides into Spanish but noted she knew of no such option for Word files. Earl and Charley echoed these thoughts. Charley stated, in reference to teaching Spanish, she struggles with and is not sure how to correctly translate student assignments and PowerPoints into Spanish. She stated it was hard to provide the students with what they needed to learn, and that while the experience was “manageable,” it was very “difficult,” and she certainly did not “excel” at it.

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This experience led Bonnie to express that pre-service teachers should be exposed to translation software. This sentiment was also suggested by Alena who suggested all teachers need to be better prepared via dual-language programs, software, or other means to better communicate with this population of students and their parents and in presenting educational documents such as worksheets for completion, PowerPoints, videos, or selected reading.

Alena also shared her difficulties with being unprepared for Spanish-only speaking; however, because Alena is bilingual, she was able to provide a different perspective of teaching Spanish-only speaking students. Alena described them as “a little bit behind and more shy to ask for help.” Earl shared how frustrating it is because the issue was not about ability or lack of a student’s intelligence, but due to barriers including that, even their district’s valedictorian was a Spanish speaker and language barriers existed with him.

Alena believed the teacher preparation process could be refined by not only having pre-service teachers work with traditional content area teachers but that they should have the opportunity to present lessons in front of Spanish speaking teachers to ensure lessons are culturally aware and inclusive. Bonnie further suggested pre-service teachers should be exposed to more Spanish centric experiences such as the FFA’s Spanish Creed Learning Development Event and to learn how to develop professional relationships with Spanish speaking.

Working with non-student stakeholders proved to be an issue as well. Alena shared her experience working with Spanish-speaking parents and stakeholders and expressed the difficulty of recruiting Spanish-speaking and Hispanic students to her program. Even students who want to be a part of a district’s agricultural program face barriers from the families. Charley and Alena stated the difficulty is due to the cultural views of agriculture, that the parents of Spanish-speaking students tend to view agriculture as hard work, in the sun, and not necessarily an opportunity for leadership or education. Alena’s experience is parents “have the notion of agriculture being a back breaking industry.” Alena believes this issue can be addressed by addressing the misconception and generalization of agriculture not being the “kind of agriculture your parents experienced.”

While all of Daniel’s students have been bilingual in Spanish and English, he expressed student involvement in activities such as the Spanish Creed was beneficial in developing positive relationships with parents and stakeholders, believing those involvements expressed an appreciation for Spanish-speaking culture. The relationship is not perfect, though, because there is a language barrier, and while the parents only speak Spanish, Daniel only speaks English, so Daniel (and the parents) can’t fully express themselves to each other because “there is always a barrier between the two, you know, they’re always translation of a conversation. I don’t know if it is that they just don’t feel comfortable talking to me. I don’t know if I’ve ever talked to one of the parents.” Earl agrees that better understanding how to bridge the communication gap with parents would have been useful to understanding how to work with Spanish-speaking students and their families.

Within this theme, the tenants of self-efficacy, human capital, and social cognitive theories can be seen. Namely, the lack of preparation in this area, via classroom instruction and student

teacher mentorship experience as undergraduate students resulted in the study participants lacking self-efficacy and experiencing a deficiency in human capital.

### **Conclusions, Implications, and Recommendations**

This study identified the need for agricultural science teacher preparation programs to provide a more practical set of knowledge, skills, and experiences in the areas related to the Spanish-speaking students at the secondary level and Spanish-speaking program stakeholders and community members. The lack of undergraduate preparation in the areas of understanding how to facilitate meaningful education to non-English speakers and how to work with non-English speaking stakeholders had a negative influence on the early career teaching experience.

Specifically, the participants needed more training and experience on how to identify and use relevant and effective language translation software specific to the needs of education. Participants also shared the need and the importance of being able to develop relationships with non-English speaking program stakeholders, specifically in developing positive relationships with the parents and guardians of their students.

These findings align with numerous studies focused on teacher preparation, early career teaching, teacher retention, teacher effectiveness, and others. Specifically, during the literature review process of this study, the researcher found research pointing to the difficulty early career teachers have in transitioning from being a student to a teacher. The experience is challenging for many with early career teachers often struggling with reconciling idealistic images of education with reality (McCurdy, 2016).

This study provides evidence that lack of self-efficacy in early career teachers can be directly traced to their teacher preparation process. Tippens et al.'s (2013) research also found that when underprepared teachers struggle with self-efficacy, the experience leads to teacher burnout. García and Weiss (2019) and Tippens et al. (2013) discussed teacher burnout and found that career-related stress, demoralization, lack of professional development, training, and mentoring are major factors attributing to teacher burnout. Burnout has led to major issues in retaining agricultural science teachers and is a recognized and increasing problem in the United States (Tippens et al., 2013). These are issues that can be addressed during the undergraduate teacher preparation process. This experience of feeling burnout leads to issues connected to agricultural science teacher retention and lack of teacher quality (Ingersoll & Smith, 2004; Ingersoll and Strong, 2011). Experienced, knowledgeable, skilled, and fully certified teachers are an imperative but a lacking component to the secondary educational experience (Walker, 2019). Walker (2019) even identifies the lack of these educators as the most critical resource denied to students.

Participants in this study indicated a specific struggle in dealing with Spanish speaking students and stakeholders. This is due to the geographic location of the specific participant schools and TAMUC. It is recommended for similar studies to be replicated regionally to determine if similar issues are present in working with students and stakeholders of Spanish speakers or any other diverse group. Moreover, it is recommended for teacher preparation programs to include foreign language course requirements in required course sequence as well as include translation

software applications in current preparation courses. Finally, it is recommended for we, as a professional organization, have focused conversations on best practices for preparing preservice teachers to effectively communicate with non-native English-speaking students and stakeholders stakeholders. It is finally recommended for these conversations and potential shifts in curriculum to explore beyond the language barrier, but in addressing the cultural perceptions and implications present in our increasing diverse student populations.

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Completed Projects; Teacher Preparation; Impacts of a Preservice Teacher Recruitment Program

**Investigating the Impacts of a Preservice Agriculture Teacher Recruitment Program using  
Kirkpatrick's Program Evaluation Model**

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## **Introduction**

Across the nation, agricultural education faces an ongoing shortage of teachers (Foster et al., 2020; Smith et al., 2019). Efforts on recruiting and retaining quality teachers are critical to solving the agriculture teacher shortage problem and the success of agriculture (Guffey & Young, 2020; Kantrovich, 2007). Regarding teacher recruitment, post-secondary agricultural education graduates have not met the demand for available agriculture teaching positions (Thieman et al., 2016). The gap between teacher demand and supply has caused multiple school-based agricultural education program closures (Gates et al., 2020; Thieman et al., 2016). Considering most preservice agricultural education students went through traditional school-based agricultural education (SBAE) programs (Ingram et al., 2018), SBAE program closures eventually affect the enrollment of post-secondary agricultural education majors and agriculture teacher supply. Thus, it is paramount to meet the need of agriculture teachers across the nation by recruiting more students into post-secondary agricultural education (Ingram et al., 2018).

Although post-secondary school agricultural education degree programs strive to meet the need of supplying agriculture teachers to mitigate these program losses, university agriculture teacher educators are faced with difficulties recruiting a necessary number of high school students to their preservice agricultural education programs (Gates et al., 2020). As a joint effort of the agricultural education profession to address this issue, the National Council for Agricultural Education (NCAE) launched the Teach Ag Campaign in cooperation with the National Association of Agricultural Educators (NAAE) and the National FFA Organization (Gates et al., 2020). The Teach Ag Campaign strives to increase awareness of career opportunities in agricultural education and encourage students to pursue a career in agricultural education (Gates et al., 2020).

The Agricultural Education Institute (AEI) is one such preservice teacher recruitment program started in 2013 within the Department of Agricultural Education and Communication (AEC) at the University of Florida (UF). It is the state's effort to address the issue of recruitment and retention of agriculture teachers. The AEI is designed to develop students' interests in becoming agriculture teaching professionals and to meet the demand of agriculture teachers in Florida. The AEI provides various opportunities for participants to learn about the UF AEC's admission process and the pathway to becoming an agriculture teacher. In addition, the program facilitators discuss topics around the transfer process, as well as college and departmental scholarship opportunities. Although the AEI has been in place for eight years, no formal evaluations of the program had been conducted; consequently, the program's outcomes and impacts on the participants were not comprehensively studied.

While previous studies provide useful information about the positive impact of the agriculture teacher recruitment efforts (Gates et al., 2020; Guffey & Young, 2020; Meyer et al., 2017), systematic program evaluation on preservice teacher recruitment programs is lacking. This study utilized the Kirkpatrick evaluation framework to provide a comprehensive understanding of the impact of recruitment programs, considering external factors that influence students' choice of academic major. This study contributed to the body of knowledge in evaluating the preservice teacher recruitment program and provided implications for effective ways to recruit highly qualified agriculture teachers.

## **Evaluation and Theoretical Framework**

This study utilized Kirkpatrick's four levels of training evaluation as an evaluation framework (Kirkpatrick, 1994) to identify the outcomes of the preservice teacher recruitment

program. The Kirkpatrick model of training evaluation includes four levels of program outcome: (a) reaction, (b) learning, (c) behavior, and (d) results (Kirkpatrick, 1994). While the first three levels are relevant to participants' reaction, learning, and behavior, the fourth level is relevant to the results of participants' learning on the organization (e.g., return on investments, productivity) (Saroyan & Trigwell, 2015).

While the Kirkpatrick model of training evaluation provides a useful framework in evaluating various educational programs, the model has been criticized for not considering intervening factors that can affect participants' transfer of learning (De Rijdt et al., 2013; Saroyan & Trigwell, 2015). To address this issue, researchers also utilized Chapman's (1981) model of student college choice, which describes the critical influencing factors on student college choice and their relationships. This model explains both students' characteristics and external factors should be considered to understand student college choice (Chapman, 1981).

### **Purpose and Objectives**

The purpose of this study was to evaluate the effectiveness of the AEI program. The following two objectives guided this study:

1. Identify the outcomes of the AEI based on Kirkpatrick's model of program outcomes.
2. Examine the external factors influencing participants' choice of academic major.

### **Methodology**

#### **Population & Sample**

The target population for this study was SBAE students who participated in the AEI. The total number of AEI participants between 2013 and 2020 is 330 (the number of participants in 2014 was not included because the 2014 participant roster was unavailable). The sample for this study was AEI alumni who participated in the program between 2013 and 2020. Purposive and convenience sampling was used in this study, with a response rate of 12.7% ( $n = 42$ ). Such a low response rate was mainly due to participants' expired school email addresses, which gave researchers challenges in reaching study participants. Survey respondents included eight males (19%) and 34 females (81%). The majority of the respondents were white ( $n = 25$ ; 59.5%), with another 15 not disclosing their race (35.7%), with an additional one each identifying as multiracial (2.4%), and Black or African American (2.4%). Additionally, most of the respondents were current college or university students ( $n = 28$ ; 66.7%), with three each responding as current 12th grade high school students (7.1%), graduate students (7.1%), and current agriculture teachers (7.1%). Five of the respondents (11.9%) did not share their current roles.

#### **Data Collection**

Surveys were used to measure the level one and two of the Kirkpatrick model of evaluation and external factors influencing participants' choice of major. Dillman's Tailored Design Method was used to encourage survey response and ensure data quality (Dillman et al., 2014). The director of the AEI sent the first survey invitation email with the Qualtrics survey link to the study sample in March 2021. The director sent participants reminder emails after two, four, and eight weeks for a total of four solicitations to help promote the response rate (Dillman et al., 2014). The final reminder email was sent in May 2021. Furthermore, the data of UF AEC admission and post-graduation employment were used to identify the behavior and results levels of the Kirkpatrick model of evaluation.

## Instruments

The authors of this study developed all the measures that assess the outcomes of the AEI program based on Kirkpatrick's (1994) four levels of training outcomes, including (a) reactions, (b) learning, (c) behavior, and (d) results. In addition, to compliment Kirkpatrick's model, the researchers collected data on the external factors influencing participants' choice of major, including (a) individuals that influence participants' choice of major, (b) characteristics of department/institution that affect participants' choice of major, and (c) additional questionnaire items. The instrument's content validity was determined by a panel of experts, including three faculty members and three graduate students in agricultural education.

The first three questions related to participants' reactions to the program, which involve (a) participants' satisfaction with the program, (b) level of participants' willingness to recommend the program to their peers, and (c) rank of activities based on the level of influence. Since these items consisted of single-item measures, the reliability of the items could not be measured (Wanous et al., 1997). Additionally, nine items were used to measure participants' learning change regarding their knowledge, attitude, and aspiration regarding a career teaching agriculture. The Cronbach alpha coefficients of knowledge, attitude, and aspiration construct were .71, .77, and .82, respectively, which indicated internal consistency reliability was acceptable. Behavior change was conceptualized as numbers of AEI participants who were/are admitted to university agriculture teacher preparation programs. The change of results was operationalized as numbers of AEI participants who are working in SBAE programs as agriculture teachers.

## Data Analysis

Data were analyzed using SPSS to run descriptive statistics. Descriptive statistics include frequency, mean, percentage, and standard deviation.

## Results

### Objective 1. Identify the outcomes of the AEI program based on Kirkpatrick's (1994) four levels of program outcomes

#### *Level 1: Reactions*

Kirkpatrick's model of program outcomes (1994) begins with Level 1, known as reactions. It is focused on the learner's takeaways and favorability of the program. Participants indicated a high level of satisfaction with the program overall ( $M = 4.05$ ,  $SD = .928$ ). The majority of the respondents indicated they would recommend the AEI to their peers ( $M = 4.51$ ,  $SD = .837$ ).

#### *Level 2: Learning (knowledge, attitude, aspiration change)*

The results indicate that the AEI has positively influenced participants' knowledge, attitude, and aspiration regarding a career teaching agriculture (See Table 2).

**Table 2**

*The Impact of the AEI on participants' knowledge, attitude, and aspiration regarding a career teaching agriculture*

Category	Item	M	SD
Knowledge	Expanded my understanding of a career as an agriculture teacher	4.61	0.72

	Helped me understand more about the career options with an agricultural education degree	4.45	0.65
	Helped me better understand the admission process for UF/AEC	4.05	0.93
Attitude	Increased my interest in teaching people about agriculture	4.66	0.63
	Increased my perception of a career teaching agriculture in a positive way	4.55	0.69
	Increased my interest in studying agricultural education	4.42	0.89
Aspiration	Promoted my desire to study agricultural education in a college or a university	4.53	0.69
	Increased my desire to become an agriculture teacher	4.37	0.85
	Reinforced my decision to be an agriculture teacher	4.16	1.10

*Note.* Strongly disagree = 1, Somewhat disagree = 2, Neither agree nor disagree = 3, Somewhat agree = 4, Strongly agree = 5.

### ***Level 3: Behavior***

Behavior change was conceptualized as the number of AEI participants who were/are admitted to university agriculture teacher preparation programs. The results indicated that of 330 participants over eight years, 29 AEI participants (8.8%) were admitted to the AEC department at UF. Among these, 26 participants pursued or are currently pursuing the agricultural education specialization. One of these 26 agricultural education specialization admits dropped out of the program for unspecified reasons. The remaining three AEC admits (of the 29) studied or are currently studying the communication and leadership development specialization.

### ***Level 4: Results***

The change of results was conceptualized as numbers of AEI participants who are working as agriculture teachers. Among program participants, as of September 2021, a total of 16 program participants (4.8%) are currently working as agriculture teachers. Fifteen were agricultural education graduates from the UF/AEC department, while one was an agricultural education major from another institution. Assuming the nine AEI alumni currently enrolled in UF/AEC choose to pursue a career teaching agriculture, it could bring the total number of program participants who teach agriculture up to 25 people.

## **Objective 2. Examine the External Factors Influencing Participants' Choice of Major *Individuals who influence participants selection of major***

Regarding individuals that influenced participants' choice of major, over 90% of respondents reported that their agriculture teacher was highly influential in selecting an academic major. Aside from their agriculture teacher, participants ranked an agricultural profession (e.g., veterinarian, rancher) and a faculty member in agricultural education as also having an impact on the selection of their major.

### ***Departmental/institutional factors influencing the selection of major***

The following factors influenced student's selection of a department/institution: (a) friendly atmosphere of department/institution, (b) reputation of department/institution (c) employment opportunities after graduation, (d) faculty of the academic department, and (f) institution admission requirements. Participants also indicated that scholarships from the

department/institution, close location to family, and other factors (i.e., facility size, small class sizes) also influenced their decision to select a department/institution.

### ***Factor of university admittance on the selection of major***

The number of respondents who were not considering a career in teaching agriculture was 11 individuals. Researchers looked at their intention to become an agriculture teacher if they had been admitted into the AEC department at UF as a freshman. The result showed that 45.5 % ( $n = 5$ ) indicated that they would have been more likely to become an agriculture teacher if they had been admitted into the AEC department as a freshman. Those who indicated "Maybe" was 9.1% ( $n = 1$ ), and "no" was 27. 3% ( $n = 3$ ), and "not applicable" was 18. 2 % ( $n = 2$ ). Among the 11 respondents, most ( $n = 8$ , 72.7%) were aware of UF's transfer option. However, three respondents were not familiar with the transfer option to become an agriculture teacher ["yes, but I do not know a lot about this option" ( $n = 1$ , 9.1%) and "no" ( $n = 2$ , 18.2%)]

### **Conclusions**

Agriculture teacher educators are challenged to recruit enough qualified and dedicated high school students to their preservice agriculture teacher programs. Despite the importance of preservice agriculture teacher recruitment programs to recruit future agriculture educators and sustain the agriculture education profession, little research has been conducted on the outcomes of agricultural education teacher recruitment programs. To address the knowledge gap in the literature, the purpose of this study was to investigate the outcomes of the AEI, which is designed to develop students' interests in becoming agriculture teaching professionals and to meet the demand of agriculture teachers in Florida. Our findings concluded that the AEI is a worthwhile program in promoting SBAE students' knowledge, attitude, and aspiration in a career in teaching agriculture. Furthermore, the study showed evidence of the program's impact on participants' choice of agricultural education major and how it benefited the agricultural education profession.

To address objective 1 of this study, the researchers utilized Kirkpatrick's four levels of training evaluation to assess the effects of the AEI program on the reaction, learning, behavior, and results levels. In terms of level one (reaction), the finding indicated participants were highly satisfied with overall program activities. In addition, the majority of respondents reported they would recommend the AEI to their peers. The results indicated that the design and implementation of the program were effective in meeting the needs of program participants.

Regarding level two (learning), the results showed that the AEI positively affected participants' knowledge, attitude, and aspiration regarding a career teaching agriculture. The result was aligned with the findings of Gates et al. (2020), which found participants' perceptions of the visited university campus climate were increased after a day-long recruitment event for high school students. In terms of level three (behavior), almost 30 AEI participants were admitted to the AEC at UF. While a few of them studied/study similar pathways, the majority pursued/pursue agricultural education. It is plausible that participants' positive change in learning led them to choose to study in an agricultural education teacher preparation program.

In regard to level four (results), the results indicated that the AEI contributes to producing many agriculture teachers who support our school-based agricultural education programs in Florida. The finding was consistent with the study of Guffey and Young (2020), which found positive effects of the participation of the federal State Teach Ag Results (STAR) program on agriculture teacher recruitment. This systematic evaluation of the AEI using the Kirkpatrick model of program evaluation demonstrated accountability to its funders and stakeholders.

Furthermore, this study also investigated individuals that influenced participants' selection of academic majors. This study found that agriculture teachers were the most influential individuals in selecting an academic major, followed by agricultural professionals and faculty members in agricultural education. This result showed that agriculture teachers greatly influenced their students' choice of major and demonstrated that interpersonal influences were an important factor that needs to be considered in understanding students' choice of academic major.

Concerning characteristics of college/department that influence participants' decision to select an academic major, friendly atmosphere of department/institution was ranked highest followed by reputation of department/institution and employment opportunities after graduation. The finding was aligned with the study of Wildman and Torres (2001), which found that the friendliness of a departmental faculty and the overall friendly atmosphere in the College of Agriculture were perceived to be the most influential in students' choice of major (Wildman & Torres, 2001). The results indicated that almost half of participants who were not considering a career in teaching agriculture reported they would have been more likely to become an agriculture teacher if they had been admitted into UF as a freshman. Agricultural education departments may consider reviewing the admission process and the main reasons applicants fail to be admitted to agricultural education programs to identify ways to recruit passionate and qualified agriculture teacher candidates. In addition, it is important to promote alternative pathways to become an agriculture teacher when not been admitted into UF as a freshman.

Overall, this study demonstrated the AEI's effectiveness in encouraging students to choose an agriculture education major and pursue a career in teaching agriculture. Agricultural education departments must continue to strive to recruit qualified agriculture teacher candidates to produce agriculture teachers who can support the future agriculture workforce and sustain the agriculture industry.

### **Recommendations**

Several recommendations for practice and research were proposed based on the findings of this study. Regarding recommendations for practice, faculty members in agricultural education departments should actively develop and implement effective preservice teacher recruitment programs to recruit qualified preservice agriculture teachers. Furthermore, the program manager of the AEI should continue to follow AEI alumni to identify the long-term impacts of the program. In addition, this study found that agriculture teachers were the most influential individuals for participants in selecting an academic major. A strong partnership with agriculture teachers is crucial to recruit qualified preservice teacher candidates.

In terms of recommendations for research, it is recommended to utilize probability sampling techniques to increase the generalizability of findings and replicate this study with a similar program to validate the findings of this study. In addition, while preservice teacher recruitment programs are beneficial for the sustainable agricultural education profession to a certain extent, it is important to note that the recruitment programs are one of many factors that influence students' choice of major. Given multiple factors influence prospective students' choice of academic major (Chapman, 1981; Wildman & Torres, 2001), future researchers need to investigate how various factors that influence students' choice of academic major interplay with each other in preservice teacher recruitment.



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**The State of Agricultural Mechanics in the Preparation of School-based Agricultural Educators**

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Emerging and Continuing Projects  
Teacher Preparation

## **The State of Agricultural Mechanics in the Preparation of School-based Agricultural Educators**

### **Introduction, Purpose, and Objectives**

Agricultural mechanics is considered a fundamental content area to agricultural education and dedicated agricultural mechanics facilities have been identified among the most common forms of school-based agricultural education (SBAE) laboratories in recent history (Phipps, 2008; Shoulders & Myers, 2012; Talbert et al., 2006; Twenter & Edwards, 2017). Further, agricultural mechanics has been reported as a critical area of content specialization when identifying characteristics and traits of successful SBAE teachers (Roberts et al., 2007). Despite the importance of the skills, first-year SBAE teachers have ranked agricultural mechanics lower than any other content area in perceived teaching self-efficacy (Burris et al., 2010). Training needs in agricultural mechanics extend beyond the first year, however, as the call and necessity for professional development in the subject is well documented (Figland et al., 2019; McKim & Saucier, 2011a; Saucier & McKim, 2011; Saucier et al., 2014; Shultz et al., 2014).

Hubert and Leising (2000) reported a national average of 6.7 credit hours of agricultural mechanics for agricultural education majors to become certified by teacher preparation programs. Burris et al. (2005) reported that 89% of agriculture teacher preparation programs required five or more agricultural mechanics credit hours for degree completion. However, more recent research has indicated a decline in the number of agricultural mechanics credits completed by SBAE instructors (Byrd et al., 2015; McKim & Saucier, 2013).

Therefore, the purpose of this study was to compare the level of agricultural mechanics preparation of preservice agriculture teachers between 2000 and 2021. The following research objectives were developed to guide the study.

1. Describe post-secondary institutions offering a four-year undergraduate degree designed to prepare students for careers as school-based agricultural education teachers.
2. Describe selected characteristics related to post-secondary instruction in agricultural mechanics.
3. Identify the current perceived level of importance of selected agricultural mechanics content areas for agricultural education graduates.
4. Identify the current perceived level of preparation for agricultural education graduates in selected agricultural mechanics content areas.
5. Compare characteristics related to post-secondary instruction in agricultural mechanics from 2000, 2005, and 2021.
6. Compare the perceived level of importance of selected agricultural mechanics content areas for agricultural education graduates from 2005 and 2021.
7. Compare the perceived level of preparation of agricultural education graduates in selected agricultural mechanics content areas from 2005 and 2021.

### **Theoretical/Conceptual Framework**

Whittington's (2005) model of teacher preparation in agricultural education serves as the conceptual framework of this study. Whittington's (2005) model depicted effective teacher preparation using four sequential phases: (a) Building Foundations; (b) Exploring Careers; (c) Professional Planning; and (d) Professional Practice. Each phase builds upon the previous, with

all phases resting upon philosophical and theoretical foundations of experiential learning, problem-based teaching, social cognition, and reflective practice (Whittington, 2005). The goal of the model is to produce agricultural educators knowledgeable of the content, skilled in educational practices related to the content, and possess dispositions that positively impact their students' educational outcomes (Whittington, 2005). In the context of agricultural mechanics education, students' learning outcomes are related to preservice teachers' foundational learning experiences to build knowledge and skills in the content area.

### **Methods**

This study sought to expand on the research of Hubert and Leising (2000) and Burris et al. (2005) by providing an update to the literature regarding the preparation of preservice teachers in agricultural mechanics. Preservice teacher preparation in agricultural mechanics content was reviewed by evaluating: (a) requirements for degree completion and teacher licensure, (b) post-secondary agricultural mechanics courses available to preservice teachers, perceptions of the importance of specific agricultural mechanics topics in teacher preparation programs, and (c) methods employed to expose preservice teachers to agricultural mechanics skills.

### **Target Population**

All post-secondary institutions that certify SBAE teachers in the U.S. served as the target population for this study. A list of member institutions of the American Association for Agricultural Education was used as the base of the target population frame. Additionally, frame error was addressed by reviewing the list of institutions with a panel of teacher educators to identify any institutions that should be removed from or added to the list. This review was followed up with an internet search of programs to determine if evidence existed of an agricultural education degree option at institutions in question or with any institution that may have been overlooked on the list by the review panel. After review, the target population was determined to be  $N=103$  institutions. Because of the relatively small size of the target population, a census was determined to be the most appropriate sampling method for the study.

### **Instrumentation**

The instrument utilized for data collection in this study was a modified version of the instrument developed by Burris et al. (2005). After obtaining an original copy of the instrument, a review was conducted with a panel of experts to determine necessary alterations to the instrument to align it with this study's objectives. The resulting instrument was comprised of a questionnaire with three sections.

The first section of the instrument contained questions designed to gain a descriptive picture of agricultural mechanics education in teacher preparation programs. Items from the instrument created by Burris et al. (2005) were retained and elements based on the findings of Hubert and Leising (2000) concerning the number of teacher candidates recommended for certification and courses/credits offered in agricultural mechanics teaching methods were added to make the collected data comparable among the studies. Some of the original items were modified to removed double-barreled wording based on the recommendations of a panel of experts. The second section of the instrument presented respondents with 10 content areas in agricultural mechanics instruction and asked respondents to identify if each of content areas was present in the SBAE curriculum in their respective states. The instrument retained the original content areas

included by Burris et al. (2005); however, updated content areas were added to reflect changes in modern technology.

The final section provided respondents with a list of competencies for each of the content areas from section one. Most of the original instrument's competencies were retained, with updated competencies provided where necessary to reflect modern technology in agricultural mechanics. New competencies were derived from the Power, Structural, and Technical System Pathway in the Agriculture, Food, and Natural Resources Standards from The National Council for Agricultural Education (2015) and state standards available to the public. Participants were asked to rate their perception of each competency's importance on a five-point, Likert-type scale with one indicating the lowest level of importance and five indicating the highest. Using a similar five-point, Likert-type scale, participants were asked to indicate their perception of the level of preparation that preservice teachers in their programs received on those same competencies. Descriptive statistics were used to report findings from the data on level of importance and level of preparation. This data was also used to generate mean weighted discrepancy scores following the Borich Needs Assessment Model (Borich, 1980). According to Borich (1980), using perceived levels of relevance and perceived levels of attainment to generate mean weighted discrepancy scores can allow for effective evaluation of teacher training by indicating priority needs in critical competencies.

### **Data Collection Procedure**

A review of the member directory of the AAAE and consultation with a panel of experts determined one individual associated with each institution to serve as the point of contact for delivery of the instrument by email. Data collection began, via Qualtrics, in October 2021. Dillman et al. (2014) tailored design method was used in an attempt to maximize the response rate. An initial email containing a link to the survey was sent to all contacts identified for the target population. This email informed them of the purpose of the study, invited questions about the study, and encouraged them to participate. Eight days later, a second email was sent to participants that had not yet responded, urging them to participate. At the time of the submission of this abstract, additional reminder emails are planned for those who have not yet responded. Any participant that declined to participate at any point was removed from the list for further contact. A week after the final reminder email, an attempt will be made to contact non-respondents to clarify correct contact information and ask for participation.

Following the final round of reminders by phone, characteristics of non-responding institutions such as institution type (land-grant, public/private, etc.), geographic region, undergraduate student population size, degree requirements in the most recent course catalog, and other descriptors will be gathered from each institution's respective website. The collected characteristics will be used to compare non-respondents to those that responded after the second email reminder (Lindner et al., 2001). Comparisons will be made using independent samples t-tests for continuous variables and chi-square tests of difference for discrete variables.

### **Data Analysis**

The instrument was reviewed for content and face validity by a panel of experts consisting of SBAE teacher educators with experience teaching agricultural mechanics content and faculty with expertise in instrument development. IBM SPSS v.27 will be used for post-hoc reliability analysis and descriptive statistics. A mean weighted discrepancy score calculator tool in

Microsoft Excel will be used to analyze the data associated level of importance and level of preparation (McKim & Saucier, 2011).

### **Findings to Date**

As of the submission of this abstract, data is currently being collected. 89 responses have been collected, constituting 86.4% of the population to whom the survey instrument was distributed. Three of the initial emails inviting participants to complete the survey bounced due to an undeliverable email address. Two of the undeliverable emails were caused by typos, which were immediately corrected and resent. The third undeliverable email was associated with a faculty member no longer employed by the respective institution, so another faculty member was identified to represent the institution and sent the corresponding survey invitation. Of the successfully delivered invitation emails, two were replied to with a recommendation of a different faculty member to represent the institution. The changes were promptly made and the invitation for each of those institutions was resent. Two institutions indicated that they did not wish to participate due to faculty vacancies. Additionally, two institutions responded that they did not have an undergraduate agricultural education program, indicating a small degree of frame error. Responses to date comprise 1862 and 1890 land grant institutions, non-land grant public and private colleges and universities ranging in enrollment size from under 1,000 to over 10,000 undergraduate students from all three AAAE regions. At the time of this submission, responding agricultural education teacher preparation programs range from zero to 50 undergraduates graduating from their programs during the 2020-2021 academic year. Further, 90.59% of current respondents report course offerings in agricultural mechanics content at their institution, with 70.13% offering those courses in the same academic department as agricultural education courses. Of the current respondents, 94.94% indicated that at least one agricultural mechanics course is required for their undergraduate students, but only 64.71% offer courses with a focus in methods of teaching agricultural mechanics. These preliminary findings are similar to those of Hubert and Leising (2000) and Burris et al. (2005); however, the completed study's findings are anticipated to reveal a more complete picture of preservice teacher preparation in agricultural mechanics.

### **Requests for Input and Guidance**

The authors of this abstract are seeking input and guidance from experienced researchers related to the best means of reporting the analyzed findings of this project. More specifically, what manner of data presentation will be most conducive to ease of interpretation when comparing this study's findings to the findings of Hubert and Leising (2000) and Burris et al. (2005)? Additionally, input is requested on the potential implications of this project in relation to the overall preparation of SBAE teachers on a national scale. The early findings have begun to suggest, despite of the ubiquitous nature of the content, preparation in agricultural mechanics is far from uniform. A positive outcome sought from the completion of this research is the potential for open discussion among teacher educators from a diverse set of institutions about best practices and overcoming challenges in preparing preservice teachers, both in the agricultural mechanics content area and in other laboratory-based topics.

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**Forecasting the Future Trends of Agricultural Mechanics Education: A Q Methodology Study**

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Emerging and Continuing Projects  
Scholarship of Teaching and Learning

## **Forecasting the Future Trends of Agricultural Mechanics Education: A Q Methodology Study**

### **Introduction, Purpose, and Objectives**

Technology in agriculture is growing at a rapid rate, dictating a need for greater agricultural mechanics education (Hancock et al., 2017). Precision agriculture and agricultural technology, engineering, and mechanization have been identified as areas of growth that will likely be critical to the agricultural industry in the future (Warren-English et al., 2019). On this point, King et al. (2019) found that school-based agricultural education (SBAE) teachers identified unmanned aerial vehicles and precision agriculture sensors as the emerging technologies that they desired more professional development on moving forward. Nevertheless, in a study of precision agriculture instruction among SBAE teachers in Illinois and Alabama, Heidenreich et al. (2020) reported that *limited integration* of such content existed in the SBAE curriculum. Additionally, King et al. (2019) found that SBAE teachers varied considerably in regard to whether they taught their students about new technologies. Instead, SBAE teachers preferred to engage students in discussions about modern approaches to agricultural mechanics, such as new technologies, through lecture-based instruction (King et al., 2019). As a result, a disconnect appears to have surfaced between interest in agricultural mechanics innovations and the use of such to engage students in SBAE programs. Consequently, a need existed to examine the future trends of agricultural mechanics education for SBAE classrooms and laboratories.

Therefore, the purpose of this study is to determine SBAE teachers' perceptions of the skills and characteristics necessary to teach in the modern agricultural mechanics content area effectively. The specific research question that guided this study was: What patterns emerge (i.e., the Q-sort factor loading) regarding what SBAE teachers perceive is needed to effectively teach agricultural mechanics at the secondary level in the 21st century?

### **Theoretical Framework**

Human Capital Theory (HCT) (Goode, 1959) served as the guiding framework for this study. At the core of HCT is the belief that a highly trained workforce is necessary for a productive society (Becker, 1993). Goode (1959) posited that education is one of the most important factors to increase human capital and that, without productive education systems, a nation will eventually be limited by a lack of trained personnel. For this study, HCT grounded the notion that for SBAE to produce skilled graduates prepared to navigate the realities of the workforce, they should have the knowledge and skills to incorporate innovations in agricultural mechanics in their careers.

### **Methods**

Q methodology was chosen as the approach to answer the research question that guided this study. Pioneered by William Stephenson in the first half of the 20th Century, Q methodology attempts to capture participants' subjectivity on a phenomenon of interest (Stephenson, 1953). Recently, agricultural mechanics educational content and technical skills have primarily been studied quantitatively (Byrd et al., 2015; Gorter & Swan, 2018; Rasty et al., 2017; Toft et al., 2021; Wells et al., 2021) and using the Delphi approach (Albritton & Roberts, 2020; Saucier et al., 2012). Some qualitative approaches have also been used to evaluate participants' perceptions of agricultural mechanics content and teaching (Granberry et al., 2021; Hainline et al., 2018; Tummons et al., 2017; Whitehair et al., 2020). Although these forms of research have provided

valuable findings, a need existed to evaluate opinions on agricultural mechanics education more holistically, which can be accomplished using Q methodology (Roberts & Montgomery, 2017).

### **Background**

In practice, Q methodology uses a sorting procedure, called a Q-sort, in which participants visually organize their beliefs concerning a set of statements, called a Q-set (Watts & Stenner, 2012). The Q-set is drawn from a much larger group of statements on the topic, called the *concourse*, generated from various formal and informal sources that contribute to the discussion on the topic (Brown, 1993). Participants, known as the P-set, complete a pre-sort questionnaire with demographic information and are invited to sort the Q-set statements onto a quasi-normal distribution board based on their agreement or disagreement with each statement. The board used for this study was a forced distribution, meaning that participants were only allowed a limited number of places for statements and would be required to sort such based on their level of agreement or disagreement. By using a forced distribution, participants must give careful consideration to the placement of statements on the board, which more adequately displays their holistic opinions on a topic (Watts & Stenner, 2012). The placement of the statements is recorded based on numbers randomly assigned to each statement for identification purposes. In the current study, I will also use a post-sort interview to allow participants to clarify their views on the placement of statements in the distribution. The data are then analyzed in a manner similar to traditional factor analysis. The primary exceptions are that the Q methodology participants are the variables being considered rather than items such as in traditional quantitative research. As a result, Leggette and Redwine (2016) argued that Q methodology is often thought of as inversion of the correlation matrices used in traditional factor analysis. Factors are extracted based on eigenvalues as a measure of their statistical strength (Brown, 1980). Following the extraction of the strongest factors, defining statements are determined for each factor and the optimal placement of each statement is noted for pure loadings on each factor. Sample sorts are then created to represent an individual that would purely align with the emergent factors. Coupled with the qualitative data from post-sort interviews, the factors aid in describing holistic views on a phenomenon (Brown, 1993).

### **Concourse and Q-set Development**

Development of the *concourse* involves collecting the full spectrum of thought and opinion on a given topic (Brown, 1993). Because the topic for this study was the future of agriculture mechanics instruction in SBAE, both formal and informal sources were sought for *concourse* development (Sæbjørnsen et al., 2016). In alignment with the recommendations of Watts and Stenner (2012), formal views were represented by an exhaustive literature review on the subject. Recent peer-reviewed journal articles, research papers, and research conference proceedings in the areas of agricultural education, secondary instruction, experiential learning, agricultural technology, innovative teaching methods in STEM, and instructional technology were all sought for their insight into potential directions for agricultural mechanics instruction in the future. Informal ideas were sought through conversations with ten agricultural education and agricultural systems technology faculty and state agricultural education directors with background knowledge in agricultural mechanics.

Additionally, social media groups of agricultural educators provide further insight into informal thoughts and opinions. In particular, five groups on the Facebook social media platform were searched for related posts and comments. Of the five, the primary subject matter of three groups

was general agricultural education, covering diverse topics in SBAE at the secondary level. Two of the groups, however, were focused purely on agricultural mechanics education. Posts were made in two of the largest groups, one representing general agricultural education and one in an agricultural mechanics-centered group, asking group members to reflect on the future of agricultural mechanics instruction at the secondary level and provide their thoughts. From both formal and informal sources, all items were gathered and organized by theme to serve as the concourse from which the Q-set would be developed.

To create the Q-set used for this study, the concourse was developed into an initial set of 189 statements. After rounds of review and discussion about validity, representation of content, and sampling method with a panel of agricultural education faculty, the initial set of statements were distilled and refined into 36 statements representing areas of technology and equipment innovations, technical skills, and instructional methods. Each area was represented by 12 statements to provide balance across the represented areas (Watts & Stenner, 2012).

### **P-set Selection**

Early in the study's design, it was determined that the subjective views of SBAE teachers would serve as the best P-set for the research question that guided the study, primarily due to their daily practical application of the subject matter. However, a high degree of diversity in views among participants was sought to better represent the range of subjectivity on the topic (Watts & Stenner, 2012). Based on the areas represented in the Q-set, viewpoints were posited to align with the following career stages: early career (five years or less), mid-career (six to fifteen years), and late-career (greater than fifteen years). As such, the process of recruiting participants started by contacting state directors of agricultural education and teacher preparation faculty members across the U.S. Emails were sent to each individual informing them of the purpose of the study and the need for diversity in participants. Recommendations were requested for two teachers in each career stage with experience in teaching agricultural mechanics. After gathering all recommendations, selections will be made for the greatest degree of diversity in views among the total participant group. Q methodology does not require a large number of participants, though Watts and Stenner (2012) recommend the P-set have a membership of at least half as large as the Q-set. With a Q-set of 36 statements, it was decided that 20 participants would be adequate for this study.

### **Data Collection**

The first phase of data collection in this study is anticipated to start in November 2021. After agreeing to be included in the study, participants will be individually contacted to schedule a time to complete their Q-sort and post-sort interview. Three days prior to their scheduled date, a reminder email will be sent that included a Qualtrics link to the pre-sort questionnaire and a link to a brief video outlining the instructions on how the sort will be conducted. Sorts will take place via a Zoom video call, during which participants will use the Easy HtmlQ software to complete their sorts. The primary researcher will be able to answer questions or address issues in real-time during the call. Post-sort interviews will immediately follow each participant's sort.

### **Data Analysis**

The final position of each of the statements on the forced distribution for each sort will be recorded. This data will then be manually entered in version 2.35 of PQ Method software

(Schmolck, 2014). The first phase of analysis will require the calculation of a correlation matrix to review the homogeneity of beliefs among the P-set. The second phase of analysis will utilize principal component analysis (PCA) to extract unrotated factors. These factors will be ranked from highest to lowest in order of eigenvalue. An eigenvalue is a measure of significance based on the amount of variation within the factor. Based on the recommendations from Brown (1980), a decision was made *a priori* to include factors with an eigenvalue of 1.0 or greater as the acceptable level of significance.

After a systematic comparison of multiple factor formats, a solution will be chosen to represent the study's findings that account for the highest number of participants as well as the greatest amount of total variance (Brown, 1980). Varimax rotation will then be used for each factor, and factor arrays will be produced to identify groups of participants that share similar beliefs. Additionally, factor loading outputs, factor scores, and consensus and distinguishing statements unique to each factor will be generated in the PQ method software (Schmolck, 2014).

To identify defining sorts, the factor matrix will be analyzed using a base significance of 0.40. A defining sort must have a significant loading and load purely on a single factor. Sorts that do not load significantly or pure on a single factor will be removed from further analysis in this study. Follow-up interviews will be conducted with highly significant and pure loaders for each factor to aid in developing a profile for each factor. Qualitative methods will be used to code and analyze the follow-up interviews (Saldaña, 2016). The thematic findings of the qualitative data strand from the follow-up interviews will then be integrated with the quantitative strand of the output from the factor analysis to develop an in-depth profile for each factor.

### **Findings to Date**

At the time of the submission of this abstract, an extensive concourse on perceptions of advancements in agricultural mechanics education has been developed and distilled into 36 statements to be sorted by participants. A critical aspect to the development of the concourse was the feedback of ten experts in agricultural mechanics education and agricultural systems technologies. The recruitment of potential participants has begun, with data collection in the form of questionnaires, sorts, and post-sort interviews on schedule to start in early November 2021. Thus far, potential participants that have expressed an interest in the study represent a high degree of diversity in background, experience level, school size, and geographic location.

### **Requests for Input/Guidance/Mentorship/Questions**

Guidance and mentorship for this project is requested from researchers that have experience conducting Q methodology studies. Although Q methodology is an established mixed-methods approach with substantial growth, it is relatively novel in agricultural education research. A search of popular research publications associated with agricultural education yielded only ten studies using Q methodology as the primary research method. Consequently, input on data analysis, interpretation, and the reporting of findings in a format conducive to publication in agricultural education journals will be especially helpful as this study continues to develop. The anticipated outcome of this project is that it will reveal patterns of beliefs that will be beneficial to the preparation of preservice teachers and the professional development of in-service teachers in technology related to agricultural mechanics education. Based on this outcome, input on the potential implications of the completed findings of this study from teacher educators is highly sought-after.

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School-Based Welding Course Learning and Self-Determination Support Interventions for  
Students with Developmental Disabilities

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# **School-Based Welding Course Learning and Self-Determination Support Interventions for Students with Developmental Disabilities**

## **Introduction**

Successful transition from secondary school to a career or educational path is achievable for students with developmental disabilities with proper training and skill readiness when equipped with training and skills taught in school-based education (Individuals with Disabilities Education Act [IDEA], 2004). Through school-based career and technology education (CTE) programs, students with developmental disabilities are more motivated to transition to post-secondary careers when they can earn industry-based credentials (Brandt et al., 2013). However, the evidence-based literature covering specific measures for teaching students with developmental disabilities in school-based agricultural education programs is limited with Wilson (2014) concluding that there is a deficit in skilled laborers in the industrial workforce. Students with developmental disabilities transition to the skilled trades workforce or post-secondary education are achievable through preparation in school-based welding programs. To enhance the transition process, the achievement of industry-based certifications through these programs requires effective teaching strategies to retain knowledge and skills and enhance self-determination (Wehmeyer, 1999).

Students' ability to perform complex skills safely and correctly in the school-based welding laboratory can provide the foundations needed for problem-solving through skill application (Johnson et al., 2014; Saucier et al., 2014). The operation of specific equipment in the welding laboratory can create a highly stimulating learning environment making skill acquisition cognitively taxing for students (Martin & Wilkins, 2021). Incorporating task analysis principles in curriculum is essential for students with developmental disabilities as arduous tasks are broken down into manageable steps to build student independence in skill achievement (McConomy et al., 2021). Effective teachers should provide opportunities for students to communicate their understanding and needs while learning new concepts (Cavendish et al., 2020). Incorporating these strategies can promote students' independent practice and self-determination when operating equipment and executing tasks.

## **Conceptual Framework**

The elements of Deci and Ryan's (1985) self-determination theory and Wehmeyer's (1999) functional model of self-determination combined with principles of teaching students in a highly stimulating environment serve as the study's conceptual framework. The internal and external motivations that affect individuals' decisions and choices set the premise for the self-determination meta-theory (Deci & Ryan, 1985; Wehmeyer, 2019). Six mini theories explain self-determination theory. First, basic needs theory explains autonomy, competence, and relatedness, which are basic physiological needs (Ryan & Deci, 2017). Second, organismic integration theory describes individuals' extrinsic motivation as being driven by individuals' internalization and perceived value of an experience (Ryan & Deci, 2017). Third, goal contents theory is the motivation driven by the goals and aspirations individuals set for themselves (Ryan & Deci, 2017). Fourth, cognitive evaluation theory explains that individuals' social experiences, incentives, evaluations, and feedback influence their intrinsic motivation (Ryan & Deci, 2017).

Fifth, three psychological factors explain causality orientations theory: autonomous, control-determined, and impersonal (Deci & Ryan, 1985; Keostner & Zucherman, 1994). Sixth, the relationships motivation theory explains the role relationships and trust play in individuals' intrinsic motivation (Ryan & Deci, 2017). To blend self-determination theory with key principles of teaching students with developmental disabilities, Wehmeyer (1999) developed the functional model of self-determination.

Wehmeyer (1999) suggested practitioners design instruction and implement curriculum with the initially limited self-determination levels of students with disabilities in mind. First, Wehmeyer's (1999) functional model of self-determination includes student learning capacity and its role in measuring self-determination. Second, when performing tasks, students should be provided opportunities to communicate their needs and make their own choices (Wehmeyer, 1999; Wehmeyer et al., 2013). Third, student perception or belief of their instructors and learning environment influence the development of self-determination (Wehmeyer, 1999). These factors contribute to student autonomy, self-regulation, psychological empowerment, and self-realization (Wehmeyer, 1999). Through the appropriate accommodations, students with learning disabilities can develop their autonomy in task performance (Wehmeyer, 1999). As for behavior, when instruction of concepts is paced and delivered concisely, students can practice self-regulation when learning how to execute concepts and tasks (Wehmeyer, 1999). Student mastery of the learning objectives assists with their psychological empowerment (Wehmeyer, 1999). Finally, self-realization is an internal motivation that develops self-determination and achievement in students (Wehmeyer, 1999; McDougall et al., 2010). Wehmeyer designed the model and included these concepts to serve as a foundation when designing and planning instruction.

By combining concepts of self-determination and factors within the functional model of self-determination, we have included the elements of external stimuli and instructional management strategies to consider when designing a holistic learning intervention. Including concise text, images representative of the task, and sequential representation of the task in a task analysis format are the elements of the intervention designed for implementation in the laboratory setting (Browder et al., 2012; Smith et al., 2016; Witzel & Mize, 2018; CAST, 2018). When measuring students' self-determination, we must consider external stimuli (e.g., sparks, flames, loud noise) because these elements may distract and deter learners from accomplishing the learning objectives (Angell et al., 2018). In addition, including instructional management strategies designed to support students with developmental disabilities provides opportunities for students to communicate their needs and make their own choices while learning new skills.

### **Purpose and Objectives**

The purpose of this mixed methods study is to determine the effectiveness of instructional support interventions and correlating instructional management strategies designed to improve the self-determination and skill performance of students with developmental disabilities in school-based introductory welding programs. The following research questions will guide the study:

- RQ1: How does an instructional management tool (i.e., graphically based teaching aid) enhance students' self-determination?
- RQ2: How does an instructional management tool (i.e., graphically based teaching aid) promote students' application of technical skills?
- RQ3: What teaching methods promote technical skill attainment and application?
- RQ4: What teaching methods influence students' self-determination?
- RQ5: What steps in the equipment operation process are the least complex and most complex for students to execute?

## Methods

Through quasi-experimental and mixed methods research design, teachers will implement a guidebook and lesson plans and record data to measure the effectiveness in Texas school-based welding laboratories. Evidence-based practices in core subjects and career and technology education (CTE) provide insight into the measures to be taken in the niche learning setting. To facilitate the instruction of steps required to operate the oxy-acetylene cutting torch, shielded metal arc welding machine (SMAW), and the metal inert gas (MIG) welding machine, I have developed a guidebook using task analysis and universal design for learning principles (CAST, 2018). To measure the impact of the instructional management tool, we will use an explanatory sequential mixed methods research design. Mixed methods design involves at least one quantitative and qualitative element (Schoonenboom & Johnson, 2017). The challenges to this research design are data collection demands and the time required to accomplish research objectives (Cresswell & Cresswell, 2020). The study will include two phases—a quantitative study followed by a qualitative study. The aggregation of data collected from the two studies can provide empirical evidence on the impact of practices in workforce education (Cresswell & Cresswell, 2020).

In study one, because a random assignment of treatments is not feasible, we will conduct a quasi-experiment (Shadish et al., 2001). A quasi-experiment is the most viable procedure for implementing interventions (independent variables) and examining their effects on dependent variables (Shadish et al., 2001) of high school welding students with a special education or 504 learning classification. School-based welding teachers in Texas and their students with developmental disabilities will serve as the units of measurement. We will use purposive sampling (Patton, 2002) to select one teacher teaching one introduction to welding course. Teachers will complete a training session to ensure treatment fidelity and efficacy when teaching lessons and collecting data. Teachers will receive lesson plans and guidebooks developed for oxy-acetylene torch cutting, SMAW, and MIG welding. The guidebook is formatted using sequential execution of steps and task analysis instructional design. Therefore, each page contains a step (e.g., *set oxygen working pressure*) in equipment operation and images of the components to be manipulated within each step. The narrative describes each step using concise, yet technical terminology used in the welding trades industry. Teacher-administrated skills assessments and American Institutes for Research (AIR) self-determination scales will be provided to teachers and students. The skills assessments measure students' proficiency of each competency after using the guidebook while practicing on each type of equipment.

Students will independently perform each skill, and teachers will score their performances based on the proper steps required to complete each task. After lessons and

assessments are finished, each teacher and student will complete the AIR scales to determine the students' observed and perceived self-determination. Teachers will assess students on the constructs of student *capacity-opportunity*, *home-school*, and *knowledgeability-perception* (Wolman et al., 1994). Similarly, students will evaluate their self-determination within the same three constructs. The observed confidence and frequency of students' requests for assistance are key factors in measuring and documenting self-determination. Quantitative data will be collected from two experimental groups and one control group (10 classes in each group): 1) The teacher-to-student, one-on-one instructional group, 2) The peer-to-peer instruction group, and 3) The teacher-centered control group. The control groups will learn and practice the same skills in a traditional format without using the guidebook. The scores from the skills assessments and the AIR scales will be analyzed using one-way ANOVA to measure the effects of the guidebook and instructional strategies on student abilities and self-determination (Cresswell & Cresswell, 2020).

Phase two of the study will use a qualitative semi-structured interview design to elicit responses (Galletta, 2013) from teachers regarding their perception of the instructional methods and the effectiveness of the guidebook. The interview protocol was designed to answer the study research questions more fully and achieve study objectives (Ritchie et al., 2018). The interview protocol was developed using theoretical components and concepts used in teaching and learning practice specific to school-based welding instruction (Galletta, 2013). The teachers in the two experimental groups ( $n = 20$ ) will be interviewed (Patton, 2002). Teachers will report on student activities that were the least useful and the most feasible for students to experience regarding the intervention and equipment operation. The interview statements will be coded according to the school, the participant, the statement itself, and the identified themes that align with the conceptual framework. Deductive analysis will be used to review data against the proposed model for self-determination in highly stimulating environments (Merriam & Tisdell, 2016). The main themes (*external stimuli*, *curriculum delivery methods*, and *student support*) and the expected subthemes (*factors in the learning environment*, *interventions*, and *learning support level and type*) will serve as the basis for analysis. The findings will provide a narrative to describe qualitatively the interventions, student self-determination, and skill mastery. We will achieve trustworthiness by combining method triangulation, investigator triangulation, and data source triangulation (Creswell & Creswell, 2020).

### **Results and Findings to Date**

We will begin the interventions in mid-fall, 2021, and we expect data for analysis in winter of 2021.

### **Requests for Input, Guidance, Mentorship, and Questions**

Fidelity of treatment and management of data collection by teachers without researchers present poses a common situation in field-based research. However, being present during interventions and with teachers during data collection is not feasible. Training teachers to administer the treatments and to collect data correctly will occur. Is there a method to ensure that data collection is consistent after the administration of the intervention? My committee has provided excellent guidance across all aspects of my study. Currently, I am pursuing a career in teacher education, specifically in agricultural teacher education and agricultural mechanics.

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Emerging & Continuing Projects; Post-Secondary Agricultural Education; and Determining the professional development

**Determining the professional development needs of students using augmented reality welding systems**

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Post-Secondary Agricultural Education;

## **Determining the professional development needs of students using augmented reality welding systems**

### **Introduction**

Welding is a highly demanded skill as there is a “welder deficit” across the United States (Croy, 2016). Metal fabrication is a skill that is crucial in agricultural mechanics as well as many other industries (Stone et al., 2011a). As the shortage of skilled welders increases, training must become more efficient in order to supply the demand (Croy, 2016). Byrd and Anderson (2012) suggested that training welders efficiently and effectively will be needed in order to manage the predicted deficit of more than 375,000 domestic welders in 2026 (Guerra, 2018). Welding is a skill that demands extensive practice and training to develop. Training is time consuming and costly (Wells & Miller, 2020).

Augmented reality (AR) simulation technology is an evolving form of educational training (Yuen et al., 2011). AR is used to overlay the real-world environment with digital technology (Yuen et al., 2011). As simulation technologies are advancing, they are rapidly emerging for training purposes in many different areas: including welding, medicine, and first responder training: (Bliss et al., 1997; Byrd, 2014; Byrd et al., 2015; Cope & Fenton-Lee, 2008; Gallagher et al., 2003; Gor et al., 2003; Kilmon et al., 2010; Kneebone, 2005; Seymour et al., 2002; Wells & Miller, 2020). Using these simulation technologies, students are able to use augmented reality training to perform specific weld joint configurations (Wells & Miller, 2020). This training technology has the potential to enhance their skill development and their abilities to achieve precise welds (Byrd, 2014; Stone et al., 2011b) AR has the potential to lead to improvement in the students’ performance overall as they are being assisted with training technology as opposed to just real-world training. These augmentations can serve to aid and enhance individuals’ knowledge and understanding of their environment (Yuen et al., 2011).

### **Theoretical Framework**

The underlying framework guiding this study was constructed using the skill acquisition theory (DeKeyser, 2015). The development of skills is explained within three stages: 1) declarative, 2) procedural and 3) automatic (DeKeyser, 2015). The declarative stage refers to acquiring knowledge of a skill before attempting to accomplish it. This knowledge is acquired by observation, verbal instruction, a demonstration of the skill or a combination of these allowing for the learners to gain insight in the procedure for the skill. Following the declarative stage, the learner can transition their knowledge of a basic concept into action, known as procedural stage. This stage consists of practice to gain accuracy to successfully accomplish the task. After the procedural stage, the learner would gain knowledge to transition into the automaticity stage (DeKeyser, 2015). This stage consists of the learner shifting their behavior to be consistent by rarely showing errors in their work (DeKeyser, 2015).

### **Purpose**

The agricultural industry is evolving (Doefert, 2011) and must continue to explore the impact of new technologies to advance the industry (Lindner et al., 2016). The purpose of this

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study is to identify the welding professional development needs of students enrolled in the Introduction to Agricultural Engineering course at [UNIVERSITY] after completing an AR welding training program using Lincoln Electric's REALWELD welding training system. This study aligns with the American Association for Agricultural Education's National Research Agenda Priority Area 5: Efficient and Effective Agricultural Education Programs (Roberts et al., 2016). The objective of our study is to describe the differences in participants' REALWELD welding parameter scores in arc-on and arc-off modes.

## Methods

Following the approval for our study by the [UNIVERSITY] Institutional Review Board (IRB), we conducted this 4-week study during the Spring 2021 semester. For this study we selected undergraduate students ( $n = 47$ ) enrolled in the Introduction to Agricultural Engineering course at [UNIVERSITY]. Three students' involvement in the study was discontinued as they failed to complete all four training sessions. Prior to the start of the study, participants completed a paper-based demographics survey adapted from Wells and Miller (2020). The survey included questions pertaining to age, gender, dominant hand use for both general and welding activities, and prior welding, AR, or VR experience.

As this is a part of a larger experiment, to develop this study we used a quasi-experimental design in which subjects were randomly assigned to one of three experimental groups. Participants from four labs were randomly assigned to three groups per laboratory section. Each student alternated through three different sequences: Virtual reality (VR, Lincoln VRTEX 360), Augmented reality (AR, Lincoln REALWELD), and live welding. Each week a group was assigned a different training protocol based upon the sequence rotations.

At the conclusion of all three weeks, the participants completed one additional week in which they completed single-pass 2F fillet welds on  $\frac{1}{4}$ " mild steel coupons under to guidance of an independent American Welding Society (AWS) Certified Welding Inspector (CWI). During this live welding training, they were allotted a two-hour lab period to complete this sequence. At the ending of this rotation, participants submitted their best weld to an AWS accredited CWI for inspection and evaluation.

For this research we are using the Lincoln Electric C300 Multi-Process welder connected to the Lincoln Electric REALWELD training system. The participants used the Gas Metal Arc Welding (GMAW) process which uses an automatically fed electrode that fuses metal together. Using the short-arc weld transfer process we used .035 wire and a 75% CO<sub>2</sub> /25% Argon gas mixture. The settings for the Lincoln Electric C300 were set at 18.0 V (voltage) and 250 ipm (inches per minute) wire feed speed. Material used was  $\frac{1}{4}$ " mild steel coupons. The participants completed a weld in the 2F welding position (T-Joint).

Each welding parameter is scored by the percentage of time within the set range. The range of the parameters relates to the minimum and maximum tolerance values. The WPS is the centroid of the minimum and maximum parameters. Once the participant has positioned themselves, audial commands will correct their position until all five parameters are in the acceptable range. The overall score on the REALWELD is determined by the percentage of time that all five parameters are within the set tolerances simultaneously (REALWELD®, 2021).

Utilizing the Lincoln REALWELD training system to conduct the research, each participant completed four arc-off passes and three arc-on passes. Researchers created a detailed script for the introduction of the station to the participants to ensure consistent instruction was given to each group. This script did not change throughout the study. Within this script, for the AR training protocol, researchers demonstrated the function of the Lincoln REALWELD as well as techniques for welding and an explanation on the five parameters for scoring. We explained the differences between VR and AR. We also described the audio cues and what corrective actions need to take place once they are stated for each of the parameters.

After our introduction we gave two demonstrations, using both the arc-off and arc-on modes. We performed two arc-off passes and one arc-on pass to familiarize the participants with the commands and the function of the machine. With one arc-off pass we demonstrated a low scoring pass. The second arc-off pass was a high scoring pass to provide the students an opportunity to hear the audio coaching difference since cues are only initiated as corrective measures when falling out of the tolerance range. The demonstrated arc-on pass was an example of an acceptable weld in the AR environment. Each participant was required to wear full welding PPE during arc-off and arc-on for safety and to mimic live welding conditions during the arc-off passes. After the demonstrations we allowed the students to begin their passes. Each participant conducted four arc-off passes and three arc-on passes, for a total of seven passes per participant per parameter yielding 132 passes recorded for each parameter.

## Results

This study collected data from forty-four participants, with a majority identifying as female ( $f = 23$ ; 52.3%). The average age of the participants was 21.84 years ( $SD = 5.17$ ). Most participants (81.8%) reported being right-hand dominant while completing most tasks, however, a larger portion (88.6%) reported being right-hand dominant while welding. Over a quarter of the participants were General Agriculture majors (36.4%), the second largest percentage of participants were Horticulture majors (20.5%), and nearly half of the participants were sophomores (43.2%).

The purpose of this study was to describe the differences in participants' REALWELD welding work angle, travel angle, CTWD, travel speed, and position scores in arc-on and arc-off modes. The mean arc-off score for work angle was 94.36 ( $SD=13.80$ ) while the arc-on score was 90.98 ( $SD=20.84$ ). The results of a paired-samples t-test revealed no significant differences between these scores. The mean of the arc-off score was 91.27 ( $SD= 16.97$ ) while the arc-on score was 89.31 ( $SD= 16.89$ ). The results of a paired-samples t-test revealed no significant differences between these scores. The mean arc-off score for CTWD was 00.11 ( $SD=3.80$ ) while the arc-on score was 90.45 ( $SD=16.95$ ). The results of a paired-samples t-test revealed a statistically significant difference between these scores ( $p < 0.05$ ). The mean arc-off score for travel speed was 73.30 ( $SD=17.25$ ) while the arc-on score was 78.13 ( $SD=20.80$ ). The results of a paired-samples t-test revealed a statistically significant difference between these scores ( $p < 0.05$ ). The mean arc-off score for work angle was 95.87 ( $SD= 11.39$ ) while the arc-on score was 95.26 ( $SD= 13.15$ ). The results of a paired-samples t-test revealed no significant differences between these scores that can be seen in Table 1.

Table 1

*Parameter Scores for Arc On and Arc Off*

Parameter	Arc Status	<i>N</i>	Mean	<i>SD</i>	<i>t</i>	<i>p</i>
Work Angle	Arc Off	132	94.36	13.80	-1.64	0.10
	Arc On	132	90.98	20.84		
Travel Angle	Arc Off	132	91.27	16.97	-1.06	0.29
	Arc On	132	89.31	16.89		
CTWD	Arc Off	132	99.11	3.80	-5.97	<0.001
	Arc On	132	90.45	16.95		
Travel Speed	Arc Off	132	73.40	17.25	2.20	0.01
	Arc On	132	78.13	20.80		
Position	Arc Off	132	95.87	11.39	-0.42	0.67
	Arc On	132	95.26	13.15		

### Conclusion, Discussion, Recommendations, Implications & Limitations

For this study we focused on the GMAW welding process. The GMAW process has fewer operator-controlled variables than other welding processes allowing for beginner and novice welders to learn more easily (Rose et al., 2015). We selected the 2F position in order to grow quicker skill development as it is recognized as a less complex joint in novice welders (Stone et al., 2013).

This could be related to the increase of anxiety levels going from arc-off to arc-on. Byrd (2014) identified that novice level participants' anxiety levels were triggered during the welding process. This could be of fear the conception that hands on welding practice can be dangerous (Byrd, 2014). Byrd (2014) suggest that constructing a training method to reduce the participants anxiety would reduce the amount of time that is needed to train them for them to become efficient. AR is a possibility for this type of training as it could increase the confidence of students getting comfortable from arc-off to arc-on but with the same instruction commands continuing.

An increase in travel speed mean scores can be noticed in Table 9. This is a representation of participants progressing within the skill acquisition theory (DeKeyser, 2015). The students were able to advance their skill in this parameter as they were putting the skill into action by watching the fusion of the metal take place. As the participants acquired the knowledge of how travel speed is supposed to function, they were able to step into the procedural stages of executing the skill (DeKeyser, 2015).

One limitation within the study is the small sample size acquired. Due to this we recommend that our study be replicated. Attaining a larger sample size is crucial to increase the reliability in the results. (Seritan et al., 2019). For future research it is recommended to use different processes and positions. We also recommend that further research to analyze anxiety levels of the participants with each sequence to determine if the order of the sequencing influences the participants.

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**Student Perspectives in Agricultural Leadership Education: A Q Methodology Study**

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## Introduction

Agricultural leadership education programs are becoming prevalent in collegiate settings across the nation. Leadership has been taught in agricultural education departments for more than 17 years, with at least 82 different courses available throughout the United States (Fritz et al., 2003). The first official agricultural leadership undergraduate major was established at Oklahoma State University (Pennington & Weeks, 2006). Today, agricultural leadership programs are found at land-grant, public, and private institutions. These programs prepare university-educated professionals to assume roles in agricultural education, both in the classroom and as extension educators. Previous to the development of leadership programs, coursework in agricultural education programs often focused on teaching methods, project supervision, and student advising all while stressing the importance of leadership development (Weeks & Weeks, 2020). Due to a lowering number of students graduating with an agricultural education degree and pursuing a school-based teaching career, universities began offering a non-teaching major designed for those without teaching interests. The non-teaching option within most agricultural education departments transformed into agricultural leadership education as a major, degree option, or minor at the undergraduate level (Weeks & Weeks, 2020).

Coursework in agricultural leadership differs from that of leadership education because it teaches the foundations of leadership contextually in agricultural sciences (Weeks & Weeks, 2020). Often, courses such as servant leadership, diversity in agriculture, leadership theory, and personal leadership development are found in agricultural leadership education undergraduate curricula (Oklahoma State University, n.d.). In these programs, students are able to develop their leadership capacity while expanding their own world and experiences (Velez et al., 2014). Not only do agricultural leadership education programs provide leadership knowledge, but also a broad introduction to agricultural sciences by focusing in areas of students' interests (Pennington & Weeks, 2006). Employers seek students that possess effective leadership skills (Lenhardt et al., 2011). Agribusiness employers deem all leadership skills important and tend to focus on honesty, attitude, trustworthiness, self-confidence, and dependability (Smalley et al., 2016). Students also believe the development of their leadership is an important part of their college education (Schumacher & Swan, 1993).

The importance of leadership to students could be a reason why agricultural leadership education is chosen as an undergraduate major or degree option; however, a variety of factors go into selecting majors. Six factors students consider when choosing a major are: a) information search, b) match with interests, c) job characteristics, d) financial considerations, e) psycho/social benefits, and f) major attributes (Beggs et al., 2006). Discussion with other students, instructors, and parent/guardian influence are other possible factors affecting student major decisions (Malgwi et al., 2005). Some suggest students may not explore many alternatives before choosing a major (Germeijis et al., 2012) or simply choose a major based off of external factors like the quality of facilities (Herren et al., 2011). Enrollment trends at Oklahoma State University indicate that often students enroll in agricultural leadership education after transferring from another program or institution (Institutional Research and Analytics, 2021). So why exactly do students choose to pursue agricultural leadership during their undergraduate

experience? With agricultural leadership education programs still considered “new” in the profession (Weeks & Weeks, 2020), the reason behind students’ choice of the major/option is not fully understood and needs to be explored.

### **Purpose and Objectives**

The purpose of this Q methodological study is to understand student perspectives of the agricultural leadership education by exploring the perceptions of students currently enrolled in undergraduate agricultural leadership education programs. By examining viewpoints of students currently enrolled in the major, deeper understanding may be discovered to recognize why students choose agricultural leadership education as their undergraduate major. Obtaining an understanding of these viewpoints will allow agricultural leadership education programs and agricultural education departments to recognize the influential factors of students’ undergraduate major decision-making process. Additionally, findings may provide insight to improve recruitment and retention efforts for agricultural leadership education undergraduate programs. The objective of this study is to describe agricultural leadership education student perceptions toward their undergraduate degree program.

### **Conceptual Framework**

Decision-making style (Scott & Bruce, 1995) was used as the conceptual framework for this study. Decision-making style operationalizes the “learned, habitual response pattern” (Scott & Bruce, 1995, p. 820) a person exhibits when making a choice. Although decision making is habit-based it can change based on the situation. Scott and Bruce (1995) developed the General Decision Making Style (GDMS) instrument to assess decision-making. Four decision-making styles were initially recognized in *behavioral* terms (i.e., *rational*, *intuitive*, *dependent*, and *avoidant*) from previous literature (Scott & Bruce, 1995; Thunholm, 2004). As a result of the instrument validation across four sample populations, a fifth decision-making style, *spontaneous*, was added to the framework (Scott & Bruce, 1995). A *rational style* is characterized by logical evaluation and a comprehensive search of alternatives; an *intuitive style* relies on feelings and hunches instead of a systematic search for information; a *dependent style* is illustrated by a search for guidance and direction from others; an *avoidant style* attempts to avoid decision making; and a *spontaneous style* is depicted by a desire to come through the decision-making process as quickly as possible and a feeling of immediacy (Scott & Bruce, 1995; Thunholm, 2004). The instrument has been used to research college major choice (Galotti et al., 2006), establishing relevancy for use in this study.

### **Methods**

Q methodology is used in research as it allows for a better understanding of the varying student perceptions of their undergraduate agricultural leadership education program. Q methodology works to reveal individuals’ diverse and distinctive viewpoints instead of displaying only one specific perspective of a group of individuals (Watts & Stenner, 2012). The methodology provides a unique way to explore perceptions of decision making “from the vantage point of self-reference” (McKeown & Thomas, 2013, p. 1). It is a methodology that bridges the strengths of quantitative and qualitative research traditions (Brown, 1996) to generate

a much more profound understanding of what students perceive about agricultural leadership education as their undergraduate program.

Q items used in this study are in the form of statements, and aim to provide a balanced coverage of the research area (Watts & Stenner, 2012). A thorough set of Q items, known as a concourse (Stephenson, 1986), was assembled from literature on the research topic, observations and informal conversations. The conceptual framework of decision-making styles (Scott & Bruce, 1995) provided the constructs in which almost 170 opinionated statements were organized. Through the principle of *heterogeneity* (Stephenson, 1953; Watts and Stenner, 2012), statements in each category were refined to include those with the greatest differences. Watts and Stenner (2012) note 40-60 Q items sampled from the concourse are adequate for a Q set to cover a topic in which respondents exhibit strong feelings or knowledge. Of the estimated 50 statements in the final Q set for this study, approximately 20 statements are included in the *rational style*, 10 in the *intuitive style*, and close to five statements in the remaining decision-making style categories. Table 1 outlines possible statements to be used in the final Q set.

**Table 1**

*Sample Q items Categorized by Decision-making Style*

<b>Rational</b>	Agricultural leadership classes are an easy A.
	It is well known that companies actively seek out agricultural leadership graduates.
<b>Intuitive</b>	This major has more of an impact on the agriculture industry than others.
	The things taught in agricultural leadership are just common sense.
<b>Dependent</b>	This degree reflects my personal values.
	Because I had leadership experience, I knew I could be successful in this degree.
<b>Avoidant</b>	I just want my degree to be agriculture related, I don't care what it is.
	I had to stick with this degree choice to graduate on time.
<b>Spontaneous</b>	Leadership is learned on the job, not in a classroom.
	Agricultural leadership is undervalued in the college.

The P set, or participant sample, for this study will be purposely chosen to provide an understanding of the student perceptions in the undergraduate agricultural leadership education programs. Participants will be currently enrolled in the agricultural leadership education programs at multiple universities. According to Watts & Stenner (2012) participants with varying experiences and perspectives related to the study concourse should be selected. To ensure diversity in the P set, attention will be paid to participant gender, ethnicity, age, and university.

The process of data collection begins with the explanation of the *condition of instruction*. The condition of instruction serves as a guiding question for participants to sort the presented Q set (Watts & Stenner, 2012). The condition of instruction for this study is, “*What are your thoughts about your major?*” Participants will first sort the Q set by organizing Q items into

three piles based on statements that are: 1) most like them, 2) most unlike them, and 3) they feel indifferent about; with no limits of on the number of items in each pile (Watts & Stenner, 2012). Once three piles are created, participants will be asked to sort the statements onto a form board. Rank ordering is important as it forces participants to compare each of the statements in terms of how they correspond to their personal opinions (McKeown & Thomas, 2013). Once the sorting is complete, the participant's Q sort is recorded and participants will be asked to complete a demographic survey. Watts and Stenner (2012) stress the importance of gathering all information likely to influence a participants' viewpoint. Possible demographics for this study include: a) gender, b) involvement in previous leadership organizations, c) year in school, and d) how they learned of the degree program. A software program specifically for Q methodology data analysis will be used to analyze sorts and provide factor arrays. Arrays, information from demographic surveys, field notes and potential follow-up interviews will aid in interpreting the various perspectives related to agricultural leadership education.

### **Findings to Date**

This research is a master's thesis project with an anticipated completion date of spring 2022. Following approval from the Institutional Review Board, Q sorts will be conducted in late fall 2021. Data analysis and interpretation will be completed in early spring 2022. Although findings in Q methodology are inductive by nature and cannot be predicted, it is anticipated two or more unique and distinct perceptions about agricultural leadership education undergraduate programs will be found among the students in this study.

### **Requests for Guidance**

At the time of the conference, data will be gathered and in the initial stages of analyzation and interpretation. Feedback, guidance, and discussion is welcomed in multiple areas.

- This study is being conducted in hopes to increase recruitment and retention efforts for the agricultural leadership education program at Oklahoma State University. How do other institutions with similar programs view the importance of this study? Could replication of the study be helpful for other universities or degree programs?
- How can the literature review be expanded? What other topics should be included to provide a strong background to those reading the completed study?
- Statement generation for the Q set was developed with the help of literature in the research area, observations, and informal conversations with those directly and indirectly involved in the agricultural leadership education program at Oklahoma State University. What possible topics and additional Q items could be incorporated into the study?
- What other considerations for the P set could be made?
- What other ideas could expand research in this field using Q methodology?
- After reviewing the initial factor arrays resulting from the Q sorts, how can the interpretation of the viewpoints be strengthened to provide rich, thick descriptions?

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Effects of Message Framing and Source of Information About an Alternative Meat Curing  
System on Information Recall, Trust, and Anticipated Purchase Behavior

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## **Effects of Message Framing and Sources of Information About an Alternative Meat Curing System on Information Recall, Trust, and Anticipated Purchase Behavior**

Meat products, particularly processed meat products, have been associated with negative health implications like contributing to cardiovascular disease and colon cancer. However, meat and meat products are an excellent source of iron and provide many amino acids humans require. Plants are not nutritionally equivalent (Wu, 2020) and far more plant-based calories and supplements are required to replace the nutritional benefits of meat consumption (McCullough, 2019). However, the 2020-2025 Dietary Guidelines for Americans (DGFA) claim dietary patterns high in fruit, vegetables, legumes, nuts, whole grains, low-fat/non-fat dairy products, and seafood paired with patterns lower in red and processed meats, refined grains, and added sugars are associated with a lower risk of obesity and all-cause mortality (United States Department of America, 2020). The association of lower red meat and processed meat consumption with positive health impacts is not rooted in reliable evidence because the current DGFA exclude virtually all clinical nutrition research trials, use epidemiological research that is not transparent or replicable, and disregard the last decade of science regarding saturated fats (Teicholz, 2020). Alternative dietary guidelines using reliable methodologies encourage adults to continue current consumption of red and processed meats (Johnston et al., 2019).

Improved meat processing methods could help combat consumer misguidance, enhance the public's perception of the healthiness of processed meat products, and benefit processed meat markets (Hung et al., 2016). Currently, most meat curing systems use sodium nitrite. Although these curing methods are efficient and safe, consumer concerns regarding cured products have increased (Sindelar & Milkowski, 2012). In response to these concerns, many meat curing alternatives have been explored including tomato paste (Deda et al., 2007), herbs and berries (Haugaard et al., 2014), and vegetable powder (Osburn, 2021) which have resulted in undesirable organoleptic properties like a less intense cured meat color and a vegetable taste and aroma (Redfield & Sullivan, 2015). No single ingredient exists that replaces the functionality (color, flavor, shelf life, and safety) of curing meat with sodium nitrite.

Meat scientists at Texas A&M University have explored the feasibility of using L-arginine to activate the endothelial nitric oxide synthase (eNOS) system in post rigor skeletal muscle to generate nitric oxide and residual nitrite to cure meat products (Osburn, 2021) without undesirable organoleptic properties. Raw, pre-rigor and post-rigor supernatant samples treated with L-arginine had higher levels of nitric oxide than control samples, providing evidence of the viability of the eNOS system to cure meat in a manner similar to conventional curing with sodium nitrite (Modrow & Osburn, 2020).

Although reactions to alternative meat curing have been positive, consumers express uncertainty about the impacts of new meat products on their health (Verbeke et al., 2015). As consumers place more emphasis on convenient, ethically raised, healthy food (United States Department of Agriculture, 2013), they are searching for more information (White et al., 2014). Positive health impacts have become critical to consumers' acceptance of food (Kraus, 2015). Therefore, capitalizing on the health benefits of meat products and strategic communication regarding the new alternative meat curing system is important. However, a growing gap in production and consumption makes communicating about food challenging (White et al., 2014).

Most people are two to six generations removed from production agriculture (Wager & Miller, 2019) and a study by the Center for Food Integrity found that only 25% of respondents strongly agree with the statement, “I trust today’s food system” (The Center for Food Integrity, 2017). Therefore, as meat production and consumption has become controversial (Hung et al., 2016), trust is diminishing (Center for Food Integrity, 2017) and consumers remain susceptible to misinformation (White et al., 2014).

## **Purpose**

The way information is presented is often more important than the content (Yang & Hobbs, 2020). Narrative message framing has been recommended to reduce cognitive load and increase positive attitudes toward complex issues (Dillard et al., 2017; Gordon et al., 2018; Seo et al., 2018; Williams et al., 2010). Narrative communication provides specific cases that require generalizing up to a truth (Bruner, 1986) and derives meaning from the cause-and-effect structure of temporal events (Dahlstrom, 2012). Narrative framing is often associated with increased recall, ease of comprehension, and shorter reading times (Zabrucky & Moore, 1999) as most information individuals encounter, daily, is in narrative form (Appel & Malečkar, 2012). A study using an EEG found respondents’ attention, working memory, and emotion were high during narrative portions of videos (Gordon et al., 2018). Narrative persuasion strategies produce higher intentions to continue learning about issues (Dillard et al., 2017), positively impact viewers’ willingness to share and accept messages (Cho et al., 2014), increase engagement (Randolph et al., 2021), and aid in reducing negative perceptions of agriculture and food technologies (Yang & Hobbs, 2020). However, storytelling has negative connotations within science (Katz, 2013). Narrative frames are often contrasted with logical-scientific message frames (Fisher, 1985) which require generalizing down to a specific case (Bruner, 1986), present context-free information (Dahlstrom, 2012) that remains true in various situations, and attempts to provide abstract truths (Bruner, 1986). Different framing strategies may represent different cognitive pathways of communication (Monteagudo-González, 2011).

The source of information is also an important peripheral cue in scientific communication because it impacts acceptance (Yang & Hobbs, 2020). Although narrative messages have been perceived as easier to understand, logical-scientific messages have been perceived as more trustworthy and from a more credible source (Yang & Hobbs, 2020). Based on these findings, the purpose of our study described herein is to use a 2X4 factorial design to determine if the source of information, along with message frames, in an online video about a meat curing innovation, impact viewers’ information recall, trust, and anticipated purchasing behavior.

## **Research Questions**

1. Are there significant mean differences in the combined dependent variable of information recall, trust, and anticipated purchase behavior for message frame (narrative vs. logical)?
2. Are there significant mean differences in the combined dependent variable of information recall, trust, and anticipated purchase behaviors for source of information (producer, consumer, meat scientist, or reporter)?

3. Is there significant interaction between message frame and source of information on combined dependent variable of information recall, trust, and anticipated purchase behaviors?

### **Theoretical Framework**

Two theoretical frameworks will guide our study. The first is message framing which is an important peripheral cue in passive processing. Message frames determine what is transcribed from actual events to organize and make sense of information (Goffman, 1974). Early framing experiments demonstrate that frames call attention to certain aspects of reality and direct attention away from other aspects (Kahneman & Tversky, 1984). Frames assign meaning to events, promote interpretations of specific issues, and impact attitudes toward information (Chong & Druckman, 2007). They affect how people comprehend, their memory of, and the way they react to a problem (Entman, 1993). Message frames simplify one's thinking as they draw lines between categories of different logical types to aid the mind in realizing messages are mutually relevant and should be interpreted with a similar type of thinking and outside information should be ignored (Bateson, 1972). Message frames can be as powerful as the language itself. If a term set forth by a frame is widely accepted, using other terms can cause lack of credibility or misunderstanding (Entman, 1993). In the context of science communication, message framing is used to emphasize relevant aspects of findings (Scheufele, 1999).

The second theoretical framework is the elaboration likelihood model of persuasion. It posits that individuals process information through either the peripheral or central route (Petty & Cacioppo, 1986) which influences attitudes (Randolph et al., 2021). Generally, information is first processed through the peripheral route and processing is based on peripheral cues like source or features of a message. This passive processing results in favorable or unfavorable thoughts and can cause individuals to seek more information (Petty & Cacioppo, 1986). Further information is then processed through the central processing route (Randolph et al., 2021) with high cognitive effort. New information is paired with previous knowledge to produce attitudes predictive of the future that are resistant to counterarguments (Petty & Cacioppo, 1986). Information consumers receive about the new alternative meat curing system will likely be their initial exposure and will be processed through the peripheral route. This passive processing relies on peripheral cues like message framing to engage individuals to seek further information that would then be processed through the central route (Petty & Cacioppo, 1986).

### **Methods**

This study is a 2x4 randomized between-groups experiment (Mertler & Reinhart, 2017) on information recall, trust, and anticipated purchase behaviors. The sample will be made up of 240 students at Texas A&M University, randomly assigned to one of eight groups (Fraenkel et al., 2008). The study will include the recommended 30 individuals per group for experimental research (Fraenkel et al., 2008) to ensure adequate statistical power.

### **Instrument**

An online Qualtrics survey will be used to collect data from respondents. Independent variables will be the message frame (narrative/logical) and source of information

(producer/consumer/meat scientist/reporter). The dependent variables being measured include information recall, trust, and anticipated purchasing behavior. Information recall will be measured using multiple choice questions, trust will be measured using a semantic differential scale of bipolar adjectives measuring the components of trust (Ohanian, 1990), and anticipated purchasing behavior will be measured using Likert scales (Fraenkel & Wallen, 2008).

### **Data Collection & Analysis**

Respondents will be randomly assigned to watch one of eight videos embedded in Qualtrics surveys distributed online. Videos will be used because they are one of the most powerful storytelling mediums to promote products (Schroeder, 2015). Videos will be approximately 90 seconds. This is because videos between 0-3 minutes have the highest engagement (Guo et al., 2014). A previous study found that medium length videos (90 seconds) had the highest elaboration and attitudes scores compared to longer and shorter videos (Randolph et al., 2021). After answering screening questions, respondents will view a video that is either narratively or logically framed. The source of information will be either a producer, consumer, reporter, or meat scientist. Then, respondents will be asked to recall information regarding the meat curing technology, express their trust toward the product, and report their anticipated future engagement with products cured using the alternative curing method.

MANOVA will be used to determine the experimental effects of the two independent variables on the three dependent variables, concurrently (Mertler & Reinhart, 2017). Advantages of using MANOVA instead of factorial ANOVA include the researcher's interest in investigating relationships among the dependent variables, rather than studying each dependent variable in isolation, and protection of familywise error due to multiple tests of likely related dependent variables (Tabachnick & Fidell, 2019). As recommended by Field (2018), a statistically significant MANOVA will be followed by a discriminate analysis to break down the linear combination in more detail. Data will be analyzed with SPSS v.28 with an *a priori* alpha of 0.05.

### **Results to Date**

As of this writing, no data has been collected. However, we hope to present preliminary findings at the American Association for Agricultural Education southern region conference.

### **Request for Input, Guidance, and Mentorship**

I am a graduate student who plans to pursue a PhD in agricultural communications. I would like to learn more from other scholars about potential research designs, methodologies, and measurements of factors related to the Elaboration Likelihood Model. I am curious about elements of verbal and visual messages and their impact on elements of the Elaboration Likelihood Model and trust. Additionally, I would like to learn more about the attributes of storytelling that make it an effective communication strategy and would appreciate ideas regarding a realistic and effect way to incorporate narrative framing into communication about production agriculture, specifically related to beef production.

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## Best Practices for Mentoring: Cooperating Teacher & Student Teacher Perspectives

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Emerging and Continuing Projects

Teacher Preparation



## **Best Practices for Mentoring: Cooperating Teacher & Student Teacher Perspectives**

### **Introduction, Purpose and Objectives**

Due to a national shortage of agriculture teachers, research is needed to identify how stakeholders can address the many challenges within agricultural education to increase the supply of agricultural educators. (Foster, Lawver & Smith, 2020). The national shortage is impacted by a low supply of agriculture teachers and teacher attrition. In efforts to address teacher attrition, a focus on teacher retention is seen through a variety of efforts and programs and is often targeted during the first years of teaching, as 44% of teachers leave the profession within the first five years of starting their teaching career (Ingersoll, Merrill, Stuckey, & Collins, 2018). The partnership with cooperating teachers is key in teacher preparation, yet we still have little knowledge of the mentoring process between cooperating teachers and their student teachers (Matsko et al., 2020).

Cooperating teachers exert profound influence over the student teacher, and work to maintain their position as positive role models (Young & Edwards, 2005). There is some confusion from cooperating teachers as to their exact role in the mentoring process (Dunning et al, 2011; Ganser, 2002). To support the relationship between cooperating teacher and student teacher, and to ensure appropriate developmental feedback and guidance is provided, cooperating teachers should be trained and prepared to supervise student teachers (Young & MacPhail, 2005). Although cooperating teachers are not novice teachers, they can be new to the supervising role of the mentoring process and unfamiliar with how to navigate the collaborative relationship within a teacher education program (Young & MacPhail, 2005).

To support the relationship of the cooperating teacher/mentors and their student teacher, planned time should be set aside for the pair to learn about and discuss each other's roles and expectations (Kajs, 2002). When cooperating teachers are given guidance and training for their role, they are more likely to provide quality feedback to student teachers (McIntyre & Killian, 1987). A mutual understanding of both roles in the mentorship process, as well as a strong understanding of the exchange needed to make a mentor-mentee relationship successful should be sought, to increase the likelihood for both the cooperating teacher and student to benefit (Kajs, 2002).

Training cooperating teachers helps to improve their observation skills and teaches them how to provide quality feedback to student teachers. The University of Florida Department of Agricultural Education and Communication instituted a cooperating teacher and student teacher training to increase the understanding of expectations for both the student teacher and the cooperating teacher and develop the skill sets of both parties. In addition, training cooperating teachers on expectations and best practices for mentoring student teachers can help increase the likelihood these practices are implemented by cooperating teachers at a high frequency (Barry, 2019). This study compared the perspectives of the mentor teacher and paired student teacher on the frequency of best practices employed by the mentor teacher. The objectives of this study were to determine the frequency of use of best practices behaviors from the perspective of the cooperating teacher, determine the frequency of use of best practices behaviors from the perspective of the student teacher, and compare these perspectives.

### **Theoretical Framework**

The theoretical foundation for this study was rooted in constructivism, where assumptions are made that learners construct their own knowledge through experiences in a variety of social

environments (Vijaya Kumari, 2014; Vygotsky, 1978). Vygotsky observed how the social setting can provide opportunities for experts to influence the learning of others who may have little or no experience in an area (Oyster & Bobbit, 2020). The theory of constructivism posits that students who are learning a new skill are more likely to be successful if they are taught by someone who is advanced or experienced in that area. This theory is further strengthened by the description of instructional scaffolding, where the construction of new ideas can be strengthened and formed with a firmer foundation (Oyster & Bobbit, 2020; Seifert & Rosemary, 2009).

In higher education, assessments will often extend beyond measuring knowledge acquisition to include behavioral evaluations, assessing the frequency for which students and teachers are carrying out certain practices. For example, it is common for assessments to ask students and teachers to report current or past participation, frequency, or duration in certain activities (Gonyea, 2005). The challenge in measuring these types of behavioral outcomes stems from the respondents' conceptualizations of behavioral frequency. Pace and Friedlander (1982) found that respondents (i.e. students) will conceptualize behavioral frequency differently given the response anchors.

Higher education institutions utilize self-reported measures to demonstrate relative efficacy; however, these measures do not always match the accuracy of their objective counterparts. According to Astin (1993), the main advantage and potential rationale for using self-reported data for evaluative purposes in this context is feasibility. Astin (1993) claimed self-report questionnaires, while exhibiting lower fidelity, have a greater bandwidth to collect data. Many times, self-reported data from surveys are often the only practical source of certain types of information because they are quicker and more economical to implement than objective testing or observational studies. One must consider many desired outcomes are impossible to measure empirically, and in cases where measures are available, they are often costly and impractical (Gonyea, 2005).

Two issues threaten the credibility of self-reported data: social desirability bias (SDB) and halo error. Social Desirability Bias (SDB) presents the biggest challenge in the conducting cooperating teacher assessments in the context of higher education. SDB is the desire to edit a response before communicating it to a researcher, in order to make the responder look good (Beretvas, Meyers, and Leite, 2002; Nancarrow and Brace, 2000). SDB can compromise evaluations in one of two ways: (1) overreporting of socially desirable behavior (such as performing teaching best practices) and underreporting of socially undesirable behavior (extensive absence), and (2) attenuation, inflation, or moderation of relationships between variables (Nancarrow and Brace, 2000). In addition, halo error creates the tendency to give consistent evaluations across a set of specific items based on a general perception of the subject (Symonds, 1925; Thorndike, 1920; Wells, 1907). This causes discrepancies in student and teacher responses, and the researchers' ability to generalize results.

These issues require the careful development of assessments that will require extra time and special consideration to increase their validity and credibility (Gonyea, 2005). It is useful to use multiple data sources or triangulation rather than relying solely on a single source self-reported data for making policy decisions. If information from differing sources (such as cooperating and

student teachers) conveys a consistent message, then the trustworthiness of the message is more secure (Gonyea, 2005).

## Methods

This descriptive, exploratory study explored the reported frequency of best practices for mentoring behaviors of cooperating teachers, and the perspective of these behaviors from the viewpoint of the student teacher. This study utilized survey research methods described below. The data collected in this study was part of a larger research project that explored cooperating teacher needs for professional support and the use of best practices for mentoring.

The population for this study included the University of Florida Department, Department of Agricultural Education and Communication spring 2021 cooperating teachers ( $N=7$ ), as well as the University of Florida student teachers who were under their supervision for the semester ( $N=7$ ). Data were collected following the conclusion of the 14-week student teaching internship. The surveys were delivered using Qualtrics® software. Of the seven cooperating teachers, six teachers responded to the survey. All seven student teachers responded to the survey, but for the purposes of this study and aligning responses for the paired student teacher and cooperating teacher, one student teacher was removed from the data set.

The survey listed seventeen best practices for mentoring behaviors. The respondents were asked to rate the frequency of the behavior using a Likert-type scale. The ratings on the scale were (1) always, (2) often, (3) sometimes, (4) rarely, and (5) never. To ensure validity, the list of best practices for mentoring was confirmed by a panel of experts outside the study. The Cronbach's alpha was  $\alpha = .72$  for the cooperating teachers instrument and  $\alpha = .94$  for the student teacher instrument. The only variation in the instruments for the cooperating teacher and student teachers was the use of first-person pronouns for cooperating teachers. Cooperating teachers self-reported on frequency of use of mentoring- behaviors best practices, while student teachers reported on the frequency of the mentoring- behaviors best practices they observed from their cooperating teacher.

The seventeen behaviors included: communicating regularly with the student teacher/intern, communicating openly with the student teacher/intern, supporting the student teachers effort, staying attuned to their mindset, attitude, and well-being, providing weekly comprehensive feedback on performance in an uninterrupted setting, using observational data as the basis for feedback sessions, encouraging the student teacher to take the lead in evaluating their teaching, involving the student teacher in all roles as a teacher, talking to the student teacher about how to become an excellent teacher through all phases of their career, sharing approaches for SAE program development and supervision, sharing their philosophy for FFA advising, making an effort to introduce the student teacher to the school community, making an effort to help the student teacher develop positive views of teaching, coaching the student teacher on strategies for developing a positive rapport with students, discussing effective student discipline strategies with the student teacher for maintaining a productive learning environment, shared approaches for effectively managing the administrative aspects of teaching, including building effective relationships with administrators and other teachers, encouraging the student teacher to maintain

active memberships in FAAE, NAAE, and FACTE, and discussing strategies for effectively managing time, priorities/projects, and email.

### Findings

Objective One: Participants had an average rating of 1.52 ( $SD=.67$ ). Cooperating teachers felt they exhibited best practices for mentoring an average frequency between *often* and *always*. Of the seventeen best practices for mentoring behaviors, cooperating teachers rated themselves significantly lower for behaviors five and 16: used observational data as the basis for feedback sessions ( $M=2.17$ ,  $SD=.75$ ) and encouraged the student teacher to maintain active memberships in FAAE, NAAE, and FACTE ( $M=2.83$ ,  $SD=1.17$ ).

Objective Two: Respondents had an average rating of 1.79 ( $SD=.80$ ) for their observation of mentoring best practices. This reflects the frequency observed by student teachers was closest to *often* in frequency. When reviewing individual best practices, there were five with a mean score between 2-4 scored higher, indicating a frequency between rarely and often. The following behaviors are included in the range of 2-4: Behavior #9, shared approaches for SAE program development and supervision; Behavior #10: shared philosophy for FFA advising; Behavior #15: shared approaches for effectively managing the administrative aspects of teaching, including building effective relationships with administrators and other teachers; Behavior #16: Encouraged the student teacher to maintain active memberships in FAAE, NAAE, and FACTE; and Behavior #17: discussed strategies for effectively managing time, priorities/projects, and email.

Objective Three: When comparing the perspectives of the cooperating teacher and student teacher, the cooperating teachers had an overall higher frequency for reporting best practices for mentoring behaviors ( $M=1.52$ ,  $SD=.67$ ), compared to rating reported by the student teachers who would have received the mentoring ( $M=1.79$ ,  $SD=.80$ ). There was only one instance of an overlap in lower frequency behaviors from both groups, which was the best practice of encouraging the student teacher to maintain active memberships in FAAE, NAAE, and FACTE.

Student teachers consistently rated cooperating teachers lower than their own reported frequency of utilizing best practices for mentoring.

### Requests for Input/Guidance/Mentorship/Questions

Since this initial cohort exhibited significant differences between what the student and teacher reported, we believe it warrants continued inquiry. Our plan is to continue to leverage self-reported measures among the students and teachers to assess the cooperating teachers' use of best practices. We believe by triangulating both perspectives, we can gain a more robust view of the experience and assess the ability to use these measures for long-term cooperating teacher efforts. We are also considering incorporating objectives measures, such as observation, to further triangulate the data. We are seeking feedback on our approach and have a few key questions to guide feedback:

1. What are your thoughts on the overall approach?
2. What are your thoughts on including observation given the bandwidth concerns?

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## **Examining High School Senior FFA Members College and Career Readiness**

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## **Introduction**

Preparing high school students to enter college and the workforce has consistently been a driving factor in education. This idea, better known as College and Career Readiness (CCR) has been described as examining the readiness of students to succeed in both college and careers (Mishkind, 2014). However, there is a lack in consistency in defining CCR across the United States, and limited knowledge in the factors that define a student as being CCR (DiBenedetto, 2015b; Mishkind, 2014). For example, the Georgia Department of Education (2018) focuses on five goals for CCR, measured by the CCR Performance Index, which include increasing achievement for all students, progressing in closing achievement gaps, increasing literacy and numeracy, increasing graduation rates, and increasing student CCR. The focus of these five goals is to increase the overall percentage of high school students graduating as college and career ready. Often, Common Core State Standards (CCSS) are used as the baseline for CCR competencies, with American College Testing (ACT) assessments serving as the measurement tool for student achievement and CCR (DiBenedetto, 2015b; DiBenedetto & Myers, 2016; DiBenedetto & Willis, 2020; Mouser et al., 2019).

However, much of the focus and rigor in preparing students to be college and career ready has been added to English language arts and mathematics standards, without adding rigor in agricultural education to stay updated with the demands of the agriculture industry (Mouser et al., 2019). Within agricultural education, students must be knowledgeable in the subject matter, and possess the skills and competencies required to act individually in solving problems and thinking critically (Carnevale et al., 2011; DiBenedetto & Myers, 2016; DiBenedetto & Willis, 2020; Schmidt et al., 2012). School-based Agricultural Education (SBAE), characterized by three components (classroom and laboratory instruction, FFA, and Supervised Agricultural Experience), has continually focused on career readiness and ensuring students are ready for life beyond school (Conley, 2014; Mouser, 2014; Mouser et al., 2019; Phipps et al., 2008; Talbert et al., 2014). Within SBAE, the National FFA Organization plays an important role outside of the classroom in preparing students to be leaders and career ready, by making “a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education” (National FFA Organization, 2021, para. 2).

DiBenedetto and Myers (2016) laid the groundwork of examining CCR of high school students by defining nine constructs which identify the knowledge, skills, and competencies required to be career ready in the 21<sup>st</sup> century. While previous studies have observed the impact SBAE, and more importantly FFA, has on CCR of agricultural education students, there is limited knowledge of the impact FFA in Georgia has on high school student CCR. As Agricultural Education continues to change to meet the ever-changing needs of today’s society, preparing students to be college and career ready needs to remain the forefront in education.

## **Purpose & Objectives**

This study seeks to discern how FFA shapes student experiences, impacts student perceptions of employability skills, and impacts self-efficacy of high school seniors in the state of Georgia. The following research objectives will guide this study:

1. Determine the impact FFA has on student college and career readiness,
2. Examine the differences in college and career readiness of students with varied FFA involvement.

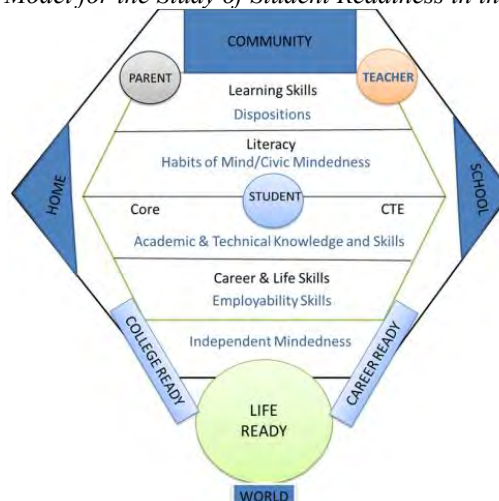
## Framework/Perspective

Bandura's (1986) Social Cognitive Theory (SCT) will serve as the theoretical framework that will guide this research. Within SCT, learning occurs through reciprocal interactions between the learner, the environment and behaviors; whereas these interactions are built into a triad and do not need to occur simultaneously for learning to occur (Bandura, 1986; Schunk, 2020). Social cognitive theory also allows the learner to utilize previously obtained knowledge and experiences to influence future knowledge and skill acquisition (Bandura, 1986). Additionally, within social cognitive theory, self-efficacy of the learner also influences the acquisition of knowledge and skills (Bandura, 1986). Bandura (1986) defines self-efficacy as one's own judgements of the skillset and ability to complete the actions necessary to attain a specific goal. Self-efficacy can be determined by individuals as they assess their capabilities to form an action or achieve a goal, where prior experiences and behaviors can influence the individual (Schunk, 2020). In having students self-report their perceptions of employability skills and ability to perform a given task or skill within being career ready, they provided their personal perceptions of self-efficacy towards their knowledge and skills obtained through FFA (Bandura, 1986).

Additionally, DiBenedetto and Myers' (2016) Model of Student Readiness in the 21<sup>st</sup> Century (Figure 1) includes Bandura's (1986) Social Cognitive Theory, as it includes various environments and the key competencies and skills required to be college and career ready. This model focuses on home, community, school, and world environments as an impact on student development and CCR, as students become more independent minded and develop the skills needed to be life ready and responsible citizens (DiBenedetto & Myers, 2016). DiBenedetto and Myers (2016) suggested additional use of their model along with the nine constructs (learning skills, life skills, career skills, social skills, knowledge competencies, incidental learning skills, dispositions, experiences, and interdisciplinary topics) identified to determine ways to prepare students to be CCR in the 21<sup>st</sup> century. In addition, DiBenedetto and Myers (2016) also suggested the use of the model and constructs to examine the perceptions of stakeholders, teachers, and parents as high school students are preparing to become CCR.

**Figure 1**

*Conceptual Model for the Study of Student Readiness in the 21<sup>st</sup> Century*



## Methods

To identify the impact FFA has on student college and career readiness in Georgia, an online-based QualtricsXM® questionnaire will be administered to senior high school students. The questionnaire was developed utilizing the framework established by Copeland et al. (2020), in examining employability skills, academic success, and demographic questions. The inclusion criteria for this study are 12<sup>th</sup> grade students involved as a member within FFA, who ideally have been a member for at least three years of high school. However, participants are not limited to those who have been a member at least three years, as the survey also seeks to discern any differences in years involved with FFA. Student ages within the population range from 17-20 years of age. Dillman et al. (2014) Tailored Design Method will be utilized as the procedure for quantitative data collection. Georgia Agricultural Education teachers will serve as the point of contact for the survey to reach students within the intended audience, and prior to distribution of the survey, pre-notice letters will be sent establishing the framework and guidelines of the study. Due to the nature of surveying students who are under the age of 18 and above the age of 18, parental consent forms will be sent to students considered minors.

As mentioned, the survey will consist of three sections, including employability skills, academic success, and demographic questions. In examining employability skills, the Youth Leadership Life Skill Development Scale developed by Seevers et al. (1995) will serve as the scale to measure leadership life skill development. The scale established for responses is four points with 0 = no gain, 1 = slight gain, 2 = moderate gain, and 3 = a lot of gain. While this scale was developed more than 20 years ago, it has been utilized by researchers in measuring leadership life skill development in youth organizations and agricultural education (Boleman et al., 2005; Copeland et al., 2020; Gibbons et al., 2017; Moran et al., 2019; Real & Harlin, 2006; Rutherford et al., 2002; Seamon, 2010; Walker et al., 2011). Examples of items to be asked include: respect what I am good at, can set priorities, create an atmosphere of acceptance, and use rational thinking.

In examining employability skills, and more particularly critical thinking, Ricketts and Rudd (2005) developed the EMI: Critical Thinking Disposition Assessment, which will be used to measure respondent skill level and dispositions towards critical thinking. This assessment utilizes a five-point Likert-type scale where 1 = strongly disagree and 5 = strongly agree, to assess critical thinking. This assessment tool has also been utilized when examining youth within agricultural education (Copeland et al., 2020; Rhoades et al., 2009; Rinker, 2014; Seamon, 2010). Sample items for examining critical thinking of employability skills include: I look for opportunities to solve problems, I am able to explain things clearly, and I consider how my biases affect my opinions.

Additionally, researchers intend to measure the communication competence of respondents through utilizing McCroskey and McCroskey (1998, 2013) Self-Perceived Communication Competence Scale. This scale seeks to measure respondent's competence of communication in increasing contexts including a dyad, group, meeting, and public speaking (Copeland et al., 2020). Respondents will be asked to answer 12 items on a slider scale, with responses ranging from 0 completely incompetent to 100 completely competent. Respondents will be asked to indicate their competence on items such as talking with a friend and talking in a large meeting of strangers.

The second section, measuring academic success, will ask respondents to indicate their GPA, whether they have taken the ACT and score if response is yes, and lastly if they have taken the SAT and score for each section if respondents answer yes.

Lastly, respondents will be asked to answer demographic questions regarding their gender identification, zip code of their home address, race or ethnicity, and their future plans upon graduation of high school. Researchers intend to also seek responses of FFA involvement, including participation in positions and events, FFA degrees achieved, and years enrolled in FFA.

After completion of the survey, quantitative data will be analyzed to determine college and career readiness of current agricultural education students in their senior year of high school. Data will be analyzed using SPSS to determine the key skills and competencies students perceive as being pertinent to college and career readiness; the self-efficacy of students toward key skills and competencies; the impact of student organizations such as FFA college and career readiness; and if differences exist in college and career readiness between student organizations.

Researchers note possible limitations to this study, including participant experiences and the use of QualtricsXM® as a form of survey. While this study seeks to discern differences in experiences of students with their perceptions of career readiness, experiences also may differ based on participation and involvement of students in varied locations across Georgia. The use of QualtricsXM® online survey as a form of instrument for this study is also a potential limitation to this study as researchers potentially face coverage error through utilization. While teachers serve as the primary form of contact in order to reach the intended population, the availability of technology access in locations across the state and lack of email use from students may be excluded from the study. Therefore, researchers note the potential of non-response error as another limitation of this study as a result of limited access to technology and/or email.

## **Results**

As this is an emerging study, there are no results to date. However, previous research indicates that students who participate in FFA often are more college and career ready than their peers. Thus, researchers believe the results from this study will conclude with similar data and indicate that FFA participation in Georgia is preparing students to be college and career ready more than peers with no involvement in FFA.

## **Requests for Input/Questions**

Researchers request input and suggestions for this study as it is emerging research and the precursor to future studies. While this study intends to focus on involvement and participation in FFA throughout Georgia, researchers are also interested in the impact of other organizations (such as but not limited to 4H, DECA, HOSA, NHS) on student college and career readiness. Researchers seek input on the impact of this study as it relates to the methods to be utilized, specific questions to utilize in the survey, and overall importance of the study. While it is evident that similar research has been conducted in examining college and career readiness of students involved in FFA, researchers ponder if it is vital to continue examining this concept across the country. Furthermore, researchers question the implementation of this study and how the results could be utilized in teaching and learning as well as teacher preparation.

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**Pronoun Preparedness of Preservice School-Based Agricultural Education Teachers:  
Analysis of Their Knowledge and Preparedness Regarding Gender Pronouns**

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## **Pronoun Preparedness of Preservice School-Based Agricultural Education Teachers: Analysis of Their Knowledge and Preparedness Regarding Gender Pronouns**

### **Introduction**

“As educators, we can take small steps to make sure all students feel welcome and affirmed in our schools regardless of their gender identity” (Cross & Hillier, 2021, para. 1). However, many K-12 teachers in the United States are ill prepared to teach lesbian, gay, bisexual, transgender, and questioning (LGBTQ+) and non-gender conforming youth (Clark, 2009). Using gender neutral language is an easy way to help transgender and gender diverse (TGD) students feel included and supported (Matsuno, 2019). Matsuno (2019) stated that including TGD issues in course curriculum is a way to create a more welcoming classroom environment. Mallinson and Inscoe (2020) asserted that “language isn’t just talk” (para. 2). They went on to describe that language can reveal and enforce stereotypes. Moreover, language often challenges the norms and conventions of society, and the use of gender inclusive language shows we value equality and are advancing social progress for all genders (Mallinson & Inscoe, 2020). Mallinson and Inscoe (2020) also contended that “while simply changing our language does not guarantee societal change, linguistic efforts have raised awareness of gendered linguistic bias in ways that have had direct social impact” (para. 3). LGBTQ+ students are in classrooms across the United States and schools should develop strategies for creating inclusive learning environments (Hall, 2021). Research shows that when compared to non-LGBTQ+ students, LGBTQ+ students are found to have higher rates of truancy, lower grades, lower high school completion rates, and fewer numbers attend four-year colleges (Aragon et al., 2014). Hall (2021) identified steps for enhancing inclusivity in career and technical education classrooms that include: responding to anti-LGBTQ+ language by students and faculty, learning the terms associated with the LGBTQ+ community, normalizing the use of gender pronouns, and using inclusive language.

One goal of the American Association for Agricultural Education (AAAE, 2020) is to “build a more inclusive culture within the society” (p. 2). As a professional organization, AAAE strives to value and embrace inclusivity as part of its mission (AAAE, 2020). However, with recent attention brought to gender-inclusive language, literature on gender-inclusive language in school-based agricultural education (SBAE) has been left out of the canon of agricultural education (Murray et al., 2020). Murray et al. (2020) concluded that few empirical studies, with a focus on sexuality, had been published in any of the field’s major journals. With little research available regarding gender pronouns and the LGBTQ+ community in SBAE, the question remains – how knowledgeable and prepared are preservice teachers to deal with situations involving gender pronouns and TGD students in their programs?

### **Purpose of the Study**

This study’s purpose is to assess the knowledge and preparedness of preservice SBAE teachers regarding gender pronouns in their programs. Two research objectives will guide the study:

RO1: Determine the knowledge of preservice SBAE teachers regarding gender pronouns (he/him, she/her, they/them);

RO2: Determine the preparedness of preservice SBAE teachers to understand and properly use gender pronouns (he/him, she/her, they/them) in their programs.

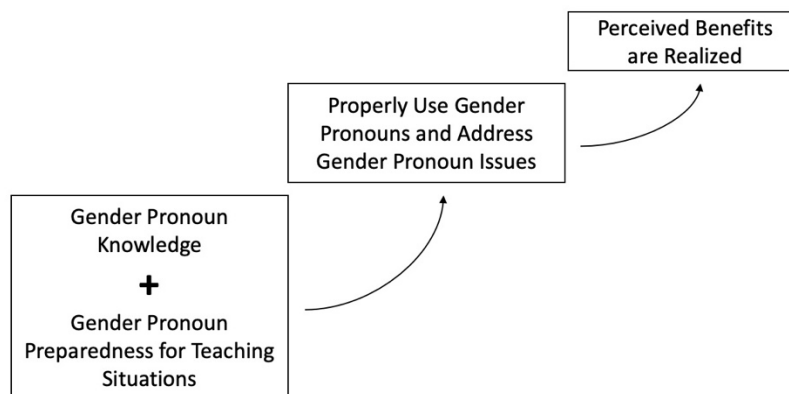
### Theoretical Framework

The theoretical framework of this study is based in Bandura's Social Cognitive Theory. Bandura developed the theory to understand the development people undergo throughout life and the behaviors they exhibit as a result. Bandura stated: "Social resources are especially important during formative years when preferences and personal standards are in a state of flux, and there are many conflicting sources of influence with which to contend" (as cited in Vasta, 1989, p. 8). Bandura explained that to overcome obstacles and stresses in life, people need social supports to give meaning to what they do. He further explained that people are not driven singularly by inner forces or by the environment, but rather their actions are determined by a combination of their motivations, behaviors, and development through social interactions with others (as cited in Vasta, 1989).

Important to this research, social cognitive theory posits that a person will be more willing to adopt an action or object if they believe a benefit exists (Vasta, 1989). Making preservice teachers aware of the benefits to their students when they feel comfortable supports the need for gender pronoun curriculum in teacher preparation. As Matsuno (2019) mentioned, the use of gender-neutral language is an easy way for students to feel more comfortable in school because they know their teachers are accepting and knowledgeable of gender pronouns and respect their related preferences.

### Conceptional Framework/Perspective

Figure 1. The Study's Conceptual Framework



The abovementioned conceptual framework will guide this study. As mentioned by Cross and Hillier (2021), all educators can take steps to make students feel welcomed in the classroom, and one way is to use gender pronouns and address situations with gender-inclusive language. To do this, as explained by social cognitive theory (Vasta, 1989), SBAE preservice teachers must see a perceived benefit with having knowledge of gender pronouns and prepared to use such to learn and actualize related teaching behaviors. Throughout the study, during their preparation at Oklahoma State University the participants will have experienced opportunities to engage in various campus activities and limited course-related activities on issues regarding the inclusivity of members of the LGBTQ+ community. These opportunities will play a role in building their

knowledge of gender pronouns and preparing them for learning situations regarding the use of such. Measuring knowledge and preparedness of preservice teachers during their teacher preparation program will aid in understanding their ability to use gender pronouns and address issues regarding gender pronouns as they teach SBAE and lead their own programs in the future.

### **Methods**

The study's participants will be preservice SBAE teachers enrolled in AGED3103: Foundations and Philosophy of Teaching Agricultural Education at Oklahoma State University ( $n = 45$ ) during the Fall semester of 2021, those who enroll in AGED4103: Methods of Teaching Agricultural Education in the Fall Semester of 2022, and those once again after their student teaching experience in the Spring Semester of 2023. This should mean that three observations occur of mostly same subjects. Seeking to measure perceptions of knowledge and preparedness, a questionnaire will be developed using Qualtrics. The questionnaire will aim to describe participants' personal characteristics and gauge their perceptions of how knowledgeable and prepared they perceive themselves to be regarding gender pronouns, especially in learning situations. The first questionnaire will include seven questions to describe the participants' gender, race/ethnicity, sexual orientation, age, home state, home community (rural, suburban, urban), and whether the participant is a traditional student or transfer student. Participants will respond to Likert-type statements to measure their perceptions on a scale of strongly agree to strongly disagree, such as (1) I understand the meaning behind the gender pronouns he/him, she/her, they/them, and; (2) I am prepared to address situations regarding students and gender pronouns in SBAE.

A second and third questionnaire will be created to be given to the same participants prior to them beginning their student teaching experience and at the completion of that experience. They will complete the second questionnaire to measure if their knowledge and preparedness of using gender pronouns has increased and whether they perceived coursework, campus/community involvement, other experiences, or a combination, had better prepared them for the use of gender pronouns in the content of SBAE. The third questionnaire will aim to measure their knowledge and preparedness of using gender pronouns, and whether they perceive their student teaching experience helped to prepare them for effectively using gender pronouns in their programs.

### **Findings to Date**

The need for this research became clear while analyzing weekly reflection videos of the Fall Semester 2021 student teachers. At Oklahoma State University, one student teacher reflected on his inability to accurately answer a student's concern when the individual asked what FFA official dress should be worn as someone who identifies as non-binary and uses they/them pronouns. The student teacher stated "that was a question I wasn't prepared to answer. In fact, neither was [cooperating teacher's name]. That was the first time he had been asked that question." The student teacher and cooperating teacher used this as an opportunity to assure the student they could choose the official dress they felt comfortable wearing.

Researchers will analyze participants' selected characteristics compared to their perceived knowledge and preparedness regarding gender pronouns. The data will be analyzed to identify

whether the preservice teachers feel more or less knowledgeable and prepared for the use of gender pronouns in SBAE at different points in their preparation and why.

### **Requests for Input/Guidance/Mentorship/Questions**

As a researcher interested in analyzing and understanding the role of SBAE in the development of LGBTQ+ students, identifying the comfort level and self-efficacy of preservice teachers regarding LGBTQ+ issues is important. It is hypothesized that the study's results will likely show preservice SBAE teachers lack understanding of gender pronoun usage and are not sufficiently prepared to address situations that may arise in SBAE regarding students and their use of gender pronouns. LGBTQ+ research within SBAE is an area in which little research exists (Murray et al., 2020). The lack of research supports the need for guidance when creating an investigation that is applicable and sensitive to members of the LGBTQ+ community as well as their heterosexual peers and stands to inform teacher educators.

### **Potential Recommendations for Practice and Research**

The study's results may identify areas of diversity and inclusion of which Oklahoma State University preservice teachers are not knowledgeable of or comfortable with before, during, or after their student teaching experience or as inservice professionals. Preservice teachers should be knowledgeable of gender pronouns, as well as prepared to effectively teach and mentor students in their SBAE programs who are gender diverse. Further, results of this research may lead to the recommendation that a diversity and inclusion instructional unit be created for preservice teachers in AGED4103 and AGED3103 at OSU regarding the use of gender pronouns in SBAE. The unit would provide preservice teachers with content regarding the different gender pronouns, how to make TGD students feel welcome and comfortable in their SBAE programs, and case studies to better prepare them for experiences they may encounter involving gender pronouns and TGD students.

Findings from the study may also help to identify if participants become more knowledgeable or prepared for gender pronouns as they matriculate through their coursework, experience community and campus involvements, other life activities, or a combination while at OSU by comparing their responses while at critical points preparing to become SBAE teachers. The study's findings will be limited to preservice teachers at OSU. However, each state's teacher certifying institution(s) should know how prepared their preservice teachers are to address situations in SBAE regarding gender pronouns and TGD students. Therefore, it may be recommended that this study be replicated at other institutions.

Although this study seeks to understand the knowledge and preparedness of preservice SBAE teachers regarding gender pronouns and TGD students, it is recommended that a similar investigation be conducted to analyze the same for inservice SBAE teachers. Results from an inservice teachers' research study may be useful in creating professional development workshops for teachers to become more aware of gender pronouns and how to properly use such terms to the benefit of their students, programs, schools, and communities.

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**Purposeful STEM Integration in School-Based Agricultural Education Programs**

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## **Purposeful STEM Integration in School-Based Agricultural Education Programs**

### **Introduction, Purpose, and Objectives**

Individuals ranging from the business sector to government have advocated for the integration of additional science, technology, engineering, and math (STEM) concepts within education (Ferand et al., 2020; Roberts et al., 2020). STEM integration within school-based agricultural education (SBAE) appears to focus more heavily on science and mathematics while deemphasizing technology and engineering (Eck et al., 2021; Wang & Knobloch, 2020). Yet, SBAE teachers have a genuine desire to integrate each curricular area of STEM into their classes so long as they are appropriate for the varying level of student ability (Stubbs & Myers, 2016).

As the emphasis for STEM integration in various classrooms becomes more apparent, it is important that teacher educators generate a positive view on the subject. According to Margot and Kettler (2019), “teachers’ years of experience are inconsistently related to their perceptions of STEM integration or education, and teachers’ value or interest in STEM may mediate the relationship” (p. 5). Essentially, those who value STEM education and are self-efficacious within the subject tend to implement STEM concepts within their curricula more readily than those who are not as self-efficacious or do not value STEM as highly (Margot & Kettler, 2019). Therefore, “it is imperative to determine how a pre-service teachers’ preparation program impacts student teachers’ lesson plan quality” (Whisenhunt et al., 2021, p. 4).

Instructional planning methods, i.e., lesson plans, aid in effective teaching strategies which increase student engagement and learning (Whisenhunt et al., 2021). Research has shown that students who are taught by teachers who use highly structured lesson plans tend to exhibit higher levels of comprehension, retention, and academic achievement when compared to students who are taught the same curricula by teachers who refrain from using highly structured lesson plans (Sung, 1982). Wang and Knobloch (2020) noted, “beliefs influence practices, and teachers’ beliefs are predictive indicators of certain instructional practices, such as inquiry” (p. 58).

The student teaching internship has been identified by both teacher educators and state staff in agricultural education to be a valuable preparatory experience for preservice teachers prior to entering the profession (Whisenhunt et al., 2021). Although different institutions have varying standards and assignments that must be completed within the program, all require their preservice teachers to demonstrate the appropriate pedagogical knowledge necessary for teaching (Whisenhunt et al., 2021). During the student teaching internship, student teachers are required to develop lesson plans that incorporate such knowledge using standards-based curricula (Eck et al., 2021; Sorensen et al., 2018).

Careers within the various agricultural sectors are requiring comprehension and application of STEM concepts now more than ever before (Stubbs & Myers, 2016). Research has shown that implementing STEM within SBAE programs can increase students’ science and mathematics achievement (Stubbs & Myers, 2016). It is possible that teacher preparedness and teaching self-efficacy can lead to increased student engagement and achievement, especially as it relates to teaching STEM concepts in the context of agriculture. Therefore, it is pivotal that SBAE teacher aspirants are prepared to develop and deliver relevant agricultural curriculum grounded in STEM



principles. The purpose of the study was to evaluate the content knowledge and interest in STEM-related careers for students enrolled in SBAE programs in Oklahoma. Two research questions guided the study:

1. Determine the change in content knowledge of SBAE students prior to and after being taught using a sustainable bioenergy curriculum; and
2. Identify SBAE students' career interest in STEM prior to and after being taught using a sustainable bioenergy curriculum.

### **Theoretical Framework**

The study was undergirded by the self-efficacy theory (Bandura, 1984). Self-efficacy “is concerned with people’s judgement of their capabilities to execute given levels of performance” (Bandura, 1984, p. 232). Perceived self-efficacy can be viewed as a person’s ability to perform a task given differentiated circumstances, ambiguous, and stressful elements (Bandura, 1984). Self-efficacy can impact an individual’s level of effort, persistence, and choice of activities (Zimmerman, 1999), ultimately allowing that person to gauge their own interests within themselves. As self-efficacy increases, the level of participation from within individuals also increases (Bandura, 1984), resulting in academic achievement (Zimmerman, 1999).

### **Methods**

SBAE students in Oklahoma whose program served as a clinical teaching site for pre-service SBAE teachers at Oklahoma State University ( $n = 8$ ) during the spring 2021 semester served as the study’s accessible population. The pre-service teachers participated in a two-hour bioenergy curriculum training prior to their clinical teaching experience. The training provided an overview of the resources, materials, and activities included in the curriculum. The sustainable bioenergy curriculum was compiled from Oklahoma Ag in the Classroom (n.d.) curriculum, National 4-H Council (2016) activities, and from modules developed by the Department of Plant and Soil Sciences at Oklahoma State University. Specifically, the curriculum consisted of five lessons including bioenergy history and biodiesel, bioplastics, plant growth readings, ethanol and fermentation, and oil extraction. Each of the lessons included the delivery of critical content through readings and content shared through a PowerPoint presentation, followed by a laboratory experiment. To further facilitate the learning experience for SBAE students, five laboratory activities were developed, including biodiesel, bioplastic, soybean, Arabidopsis germination, ethanol, and oil extraction from vegetable matter. Each laboratory experience was embedded with STEM-based connections and conveyed the use and importance of the scientific method.

After completing the sustainable bioenergy curriculum training and the five bioenergy laboratories on campus, pre-service teachers were asked to deliver the sustainable bioenergy curriculum to SBAE students during their student teaching internship. To further support the curriculum, pre-service teachers were provided a complete sustainable bioenergy laboratory kit to use including all components of the curriculum: a chemistry glassware set, petri dishes, rubber gloves, PH meter, spring scale, pipettes, digital scale, caliper, timer, tape measure, filtration system, filter paper, tea candles, string, bromothymol blue, yeast, pens, centrifuge tubes, tape, thermometer, goggles, laboratory coats, matches, hot plate/stirrer, hand operated vacuum pump, grow system, coffee grinder glycerin, balloons, corn starch, vegetable oil, canola oil, growing

## COMPLETED PROJECTS, TEACHER PREPARATION, PURPOSEFUL STEM

containers, planters, soil brick, methanol, ethanol, separatory funnel, fertilizer, potassium hydroxide, and nine seed varieties. A lesson plan and video tutorial accompanied each lesson and laboratory exercise in case the student teaching interns needed a refresher to boost their self-efficacy prior to teaching the lesson. In addition to teaching the curriculum, pre-service teachers were asked to collect pre- and post-test data from their students. In return for teaching the sustainable bioenergy curriculum and providing their pre- and post-test data, pre-service teachers were allowed to keep the sustainable bioenergy laboratory kit for their future use as an in-service teacher. In total, the biofuels kits were valued at \$1,200 each and were purchased through a grant-funded project through USDA NIFA.

A criterion-referenced examination was developed to measure bioenergy content knowledge. The examination consisted of 25 multiple-choice questions to measure the knowledge of students on bioenergy history, biodiesel, bioplastics, plant growth, ethanol and fermentation, and oil extraction. The requirements of Wiersma and Jurs (1990) were followed to ensure reliability of the examination. In addition to the criterion-referenced questions, the STEM semantics instrument (Knezek & Christensen, 2008) was included to assess students' perceptions of each of the four disciplines represented by STEM and a STEM-based career. Specifically, five questions were asked for science, five for math, five for engineering, five for technology, and five for a career in STEM. Each of the items was ranked on a seven-point summated scale.

Eight pre-service SBAE teachers from Oklahoma State University administered the sustainable bioenergy pre-test to a total of 142 secondary SBAE students. Of those initial 142 students, 42% ( $n = 60$ ) completed the unit of instruction, including the post-test. The 60 students represented four pre-service SBAE teachers from Oklahoma State University teaching at four different secondary programs. Data were analyzed using SPSS Version 26 and included descriptive and inferential statistics. Table 1 outlines the personal characteristic data (i.e., gender, age, ethnicity, race, year in FFA, and school classification) for SBAE students participating in the study.

**Table 1**

*SBAE Student Participant Characteristic Data (n = 60)*

Demographic		<i>f</i>	%
Gender	Male	33	55.0
	Female	26	43.3
	Other	0	0.0
	Prefer to not respond	1	1.7
Age	14	4	6.7
	15	24	40.0
	16	20	33.3
	17	9	15.0
	18	2	3.3
	Prefer to not respond	1	1.7
Ethnicity	Hispanic/Latino	6	10.0

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	Non-Hispanic/Latino	51	85.0
	Prefer to not respond	3	5.0
Race	Indigenous American	6	10.0
	Black or African American	2	3.3
	White	37	61.7
	Two or more races	12	20.0
	Other	0	0.0
	Prefer to not respond	3	5.0
Year in FFA	First	31	51.7
	Second	11	18.3
	Third	12	20.0
	Fourth	5	8.3
	Prefer to not respond	1	1.7
School Classification	Rural	25	41.7
	Suburban	27	45.0
	Urban	5	8.3
	Unknown	3	5.0

### Findings

#### Research Question 1: Determine the Change in Content Knowledge Prior to and After the Delivery of the Sustainable Bioenergy Curriculum

The student teachers began their sustainable bioenergy unit of instruction with a 25-question criterion-referenced examination to establish a baseline of content knowledge. The 25-questions were equally weighted and worth 1-point each, for a maximum score of 25 points. A total of 60 students completed both tests. The pre-test resulted in a mean score of 12.94 ( $SD = 3.16$ ), which equated to a 52%, or an F letter grade. Scores on the pre-test ranged from a low of 1 correct answer to a high of 21 correct answers. After students completed the pre-test, a five-day sustainable bioenergy unit of instruction was delivered by the student teachers. After completion of the unit, a post-test was administered to measure student growth. The post-test included the same 25 criterion-referenced questions related to content from the unit of instruction. The questions and answer choices were reordered prior to distribution to account for test effect. Sixty students completed the post-test with a mean score of 20.45 ( $SD = 4.72$ ), which equated to an 81%, or a B letter grade. The post-test scores ranged from a low of 7 to a perfect score of 25.

To further understand the change in content knowledge based on the sustainable bioenergy curriculum, a one-way ANOVA was implemented to compare the pre- and post-test scores. The results of the ANOVA indicated a statistically significant difference  $F(1, 200) = 159.88, p < .01$  in scores after the five-week unit was taught (see Table 2).

**Table 2**

*Comparative Analysis of Student Performance by Group Means as Measured by the Sustainable Bioenergy Criterion Referenced Exam*

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between Groups	2190.80	1	2190.80	159.88	.00
Within Groups	2740.59	200	13.70		
Total	4931.39	201			

**Research Question 2: Identify the Career Interest in STEM Prior to and After the Delivery of the Sustainable Bioenergy Curriculum**

To determine STEM career interest, a 25-item STEM semantics instrument (Knezek & Christensen, 2008) was used. The instrument implemented a 7-point semantic scale, as outlined in Table 2. The mean scores for each of the five-item stems (i.e., science, math, engineering, technology, and a career in STEM) are provided in Table 2 for both the pre-test and post-test, along with the corresponding semantic ranges.

**Table 2***SBAE Student STEM Semantic Ratings (n = 60)*

Item Stem	Semantic Scale	Pre-Test	Post-Test
Science is . . .	Fascinating to Mundane	3.68	3.12
	Appealing to Unappealing	3.86	3.09
	Exciting to Unexciting	4.07	3.22
	Means Nothing to Means A Lot	4.09	3.86
	Boring to Interesting	3.53	3.60
Math is . . .	Boring to Interesting	3.08	3.06
	Appealing to Unappealing	4.14	4.20
	Fascinating to Mundane	4.36	3.76
	Exciting to Unexciting	4.54	3.69
	Means Nothing to Means A Lot	3.85	3.57
Engineering is . . .	Appealing to Unappealing	3.47	2.86
	Fascinating to Mundane	3.47	2.96
	Means Nothing to Means A Lot	4.86	4.41
	Exciting to Unexciting	3.83	3.10
	Boring to Interesting	4.41	4.18
Technology is . . .	Appealing to Unappealing	3.05	3.28
	Means Nothing to Means A Lot	4.37	4.13
	Boring to Interesting	4.47	4.21
	Exciting to Unexciting	3.42	3.14
	Fascinating to Mundane	3.54	3.16
A Career in STEM is . . .	Irrelevant to Fascinating	3.87	4.04
	Boring to Interesting	4.23	4.22

Exciting to Unexciting	3.61	3.12
Fascinating to Mundane	3.69	3.23
Appealing to Unappealing	3.83	3.37

*Note.* Semantic scale ranged from 1 to 7.

### **Conclusion/Discussion/Implications/Recommendations**

Overarchingly, this study resulted in a statistically significant gain in students' STEM knowledge as a result of teaching the content and laboratory experiences in the sustainable bioenergy curriculum kit  $F(1,118) = 106.04, p < .01$ . Mean scores increased three letter grades and almost 30 percentage points from 12.94 or an F letter grade (52%) on the pre-test to 20.45 or a B letter grade (81%) at the conclusion of the sustainable bioenergy unit. This increase in knowledge can be attributed to criterion-referenced STEM curriculum that was developed for student teachers to deliver to their secondary students after an in-service training to improve their teaching self-efficacy related to the STEM curriculum development and delivery. Perhaps additional curriculum with a STEM focus needs to be developed specifically for SBAE teachers to teach after receiving in-service training. Doing so would align with other researchers (Eck et al., 2021; Ferand et al., 2020; Roberts et al., 2020) who have clamored for the need to further integrate STEM in SBAE. It would also emphasize the relationship between teachers' STEM self-efficacy and their willingness to integrate STEM curriculum (Margot & Kettler, 2019).

Although a change in content knowledge was documented, SBAE student interest in STEM decreased in the middle of the 7-point semantic scale. Specifically, minimal differences existed in student interest in STEM as a result of the five-week experience (see Table 2). The greatest changes in the semantic scale were in students' appreciation for science and interest in STEM-based careers after participating in the sustainable bioenergy unit of instruction. Even though the changes were minimal, perhaps the delivery of additional STEM-based units of instruction would further increase the appreciation for STEM and interest in STEM careers. With the documented need of additional STEM-related training for SBAE teachers (Stubbs & Myers, 2016), emphasis should seek to further develop instructional planning methods and effective teaching strategies to aid in student engagement and learning in SBAE teacher preparation programs. Doing so aligns with the findings of Whisenhunt et al. (2021).

Unfortunately, math, engineering, and technology are still areas that SBAE teachers need to address further within their curriculum. Wang and Knobloch (2020) found current STEM integration within SBAE to focus primarily on the science within agricultural education. Considering these studies, SBAE teacher preparation programs and professional development opportunities need to focus on the complete STEM model and not solely on science. Future research needs to explore the preparedness of SBAE teachers to develop, teach, and evaluate the impact of all four components of STEM (i.e., science, technology, engineering, and math). In addition, an analysis of state and national SBAE standards could help determine the expectation and rigor of SBAE courses in different career pathways. Understanding SBAE teacher preparedness and self-efficacy, along with the expectation and rigor in each state, will allow SBAE teacher preparation faculty the opportunity to tailor the development of in-service and preservice teachers to increase STEM integration.

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## COMPLETED PROJECTS, TEACHER PREPARATION, PURPOSEFUL STEM

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# **Effects of an Instructional Treatment on the Interest, Self-Efficacy, and Knowledge of Novice Arduino Users**

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## **Introduction**

Microcontrollers are integrated circuit devices containing a microprocessor, memory, and peripherals that receive inputs and control outputs in electronic and other systems (Keim, 2019). Microcontrollers are widely used as embedded computing systems in many agricultural applications such as tractors (Goering et al., 2003), smart irrigation systems (Goap et al., 2018), field robots (Suprem et al., 2013), and variable-rate applicators (Schumann, 2010). Given the ubiquity of microprocessors and embedded computing, undergraduate agriculture students should develop a basic understanding of these technologies.

Arduino is a programmable, open-source microcontroller and software program widely used at all levels of education (Al-Abad, 2017). Although Arduino is relatively user-friendly, barriers may exist as novice users encounter unfamiliar concepts associated with computer programming (Thomas et al., 2011).

Mercier (2015) called for efforts to prepare graduates for “related occupations that serve the . . . agricultural and food science disciplines” (p. 2). Stripling & Ricketts (2016) called for research to support development of a scientific workforce. The purpose of this study was to determine the effects of an instructional treatment on interest, self-efficacy, and knowledge of novice Arduino users in a college of agriculture. The results of this study will be used to guide and refine further teaching and learning experiences using this important technology in colleges of agriculture.

## **Theoretical Framework**

Bandura’s (1986) self-efficacy theory provided the theoretical framework for this study. According to Bandura, self-efficacy is an individual’s assessment of their own ability to successfully achieve a desired outcome when engaged in a task or activity. Self-efficacy is affected by mastery experiences, vicarious experiences, and social persuasion (McKim & Velez,

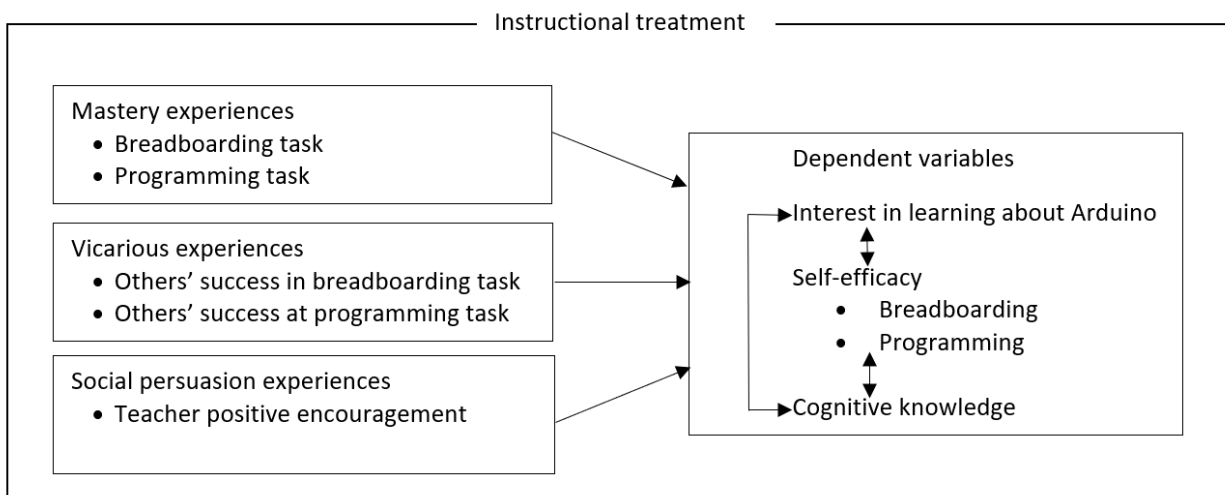


2016). Mastery experiences, which have the most powerful effect on self-efficacy, occur when an individual has personal success in accomplishing a task. Vicarious experiences occur when an individual observes others, similar to themselves, successfully accomplish a task. Social persuasion experiences occur when a trusted individual expresses confidence the individual can successfully accomplish a task.

Figure 1 illustrates how Bandura's (1986) self-efficacy theory was applied in this study. Following classroom instruction, students had the opportunity to engage in mastery experiences with breadboarding and programming within the context of the hands-on activity. Students also participated in vicarious experiences as classmates achieved success in the breadboarding and programming tasks; these successes were announced by the instructor. Finally, students participated in social persuasion experiences as the instructor made encouraging comments while the students worked. Example comments included, "Great job on breadboarding - many of you have your circuits correctly breadboarded" and "You're getting the hang of programming - many are just a step away from having it correct." Previous research (Lee et al., 2014) has found positive relationships between self-efficacy, interest, and learning in academic subjects. Therefore, our model assumed positive intercorrelations between the dependent variables .

**Figure 1**

*Bandura's (1986) Self-efficacy Theory as Applied to the Arduino Study*



## Methods

The population for this study consisted of novice Arduino users in the College of Agricultural, Food and Life Sciences at the University of Arkansas. The accessible sample consisted of all students ( $n = 41$ ) enrolled in an introductory agricultural systems technology course in fall 2021.

This study employed a separate-sample pretest-posttest group design (Campbell & Stanley, 1963; design 12) and a one-group pretest-posttest design (Campbell & Stanley; design 2). Design 12 controls all threats to external validity and all threats to internal validity except for history, maturation, and the interaction of history and maturation; however, given the nature and the short

duration (3 class meetings over one week) of the study, history, maturation and the interaction of history and maturation can be plausibly ruled out as threats (Campbell & Stanley, 1963). Design 2, an inherently weaker design, served as an internal replication.

## Figure 2

### *Research Design used in Arduino Study*

R <sub>A</sub> (Control)	O <sub>1</sub>	X	O <sub>2</sub>
R <sub>B</sub> (Treatment)		X	O <sub>2</sub>

For Design 12, a one-way MANOVA was used to test for significant ( $p \leq .05$ ) differences between groups R<sub>A</sub> and R<sub>B</sub> on measures O<sub>1</sub> (for R<sub>A</sub>) and O<sub>2</sub> (for R<sub>B</sub>). A significant MANOVA was followed by univariate ANOVAs to identify the dependent variables where the groups differed (O'Rourke et al., 2005). For Design 2, paired  $t$  tests, with the Bonferroni correction (Field & Miles, 2012), were used to test for significant ( $p \leq .0125$ ) differences between O<sub>1</sub> and O<sub>2</sub> for group R<sub>A</sub> only. The dependent variables were interest in Arduino, breadboarding self-efficacy, programming self-efficacy, and Arduino breadboarding and programming knowledge. We also examined the intercorrelations between the independent and dependent variables.

Students consenting to participate in the study ( $n = 38$ ) were randomly assigned to one of two groups R<sub>A</sub> or R<sub>B</sub>). On Day 1, both groups met in separate online class sessions. The control group was pretested prior to the instructional treatment to measure baseline interest, self-efficacy, and knowledge concerning circuit breadboarding and Arduino programming. Both groups received the same 30-minute pre-recorded lecture about Arduino programmable microcontrollers; basic circuit components; breadboarding; and programming. On Day 2, students met in the computer lab at two different, but successive 50-minute periods, and each student was provided with an activity sheet, an Arduino, all necessary supplies, access to a computer with Arduino programming software and help menu, and a printed reference sheet. For the activity, students breadboarded two separate light-emitting diode (LED) circuits (one with a blue LED the other with a red LED) and programmed the Arduino to cause the LEDs to blink on and off for specific durations and in a specific sequence. On Day 3, all students met together, were debriefed on the instructional treatment, and completed the interest, self-efficacy, and knowledge posttests.

Pretest and posttest versions of two instruments were developed and used in this study. The first instrument was based on an interest inventory developed by Gable and Roberts (1983) and a programming self-efficacy instrument developed by Kittur (2020). This instrument contained four sections measuring interest in Arduino (13 items; pretest  $\alpha = .88$ ; posttest  $\alpha = .93$ ), breadboarding self-efficacy (9 items; pretest  $\alpha = .93$ ; posttest  $\alpha = .94$ ), programming self-efficacy (8 items; pretest  $\alpha = .94$ ; posttest  $\alpha = .88$ ), and student demographic characteristics (4 items). Self-efficacy scales were constructed following recommendations by Bandura (2006). The researchers developed a 14 item multiple choice test to measure cognitive knowledge. The same cognitive test was administered as both a pretest and a posttest, with the response options reordered for the second administration. KR-21 reliabilities were .43 for the posttest and .64 for

the posttest. The low reliability for the pretest was consistent with guessing as the test completion strategy (Paek, 2014). This was confirmed by a 15<sup>th</sup> item on the pretest where 93.8% of students indicated they were “not at all confident” their answers were correct. All instructional materials and instruments used in this study were examined by a panel of three expert faculty in engineering education at two universities and were judged to possess face and content validity and were judged appropriate to meet the study objectives.

A rubric was developed to score the breadboarding (10 points possible) and programming (15 points possible) tasks for the projects completed on Day 2. One researcher scored all of the projects and a second researcher used the same rubric to score five randomly selected projects. The Cohen’s kappa coefficients for breadboarding and programming were .87 and 1.0, respectively, indicating near perfect and perfect agreement (Cohen, 1960).

## Results

Twenty-six students completed all components of the study; however, two students in group R<sub>A</sub> completed the pretests but missed a subsequent class period. Pretest scores for these two individuals were included in the analysis for Design 12 only, providing 16 students in group R<sub>A</sub> for O<sub>1</sub> and 12 in group R<sub>B</sub> for O<sub>2</sub>. For Design 2, only the 14 students in group R<sub>A</sub> completing all portions of the study were included. A majority of students ( $n = 28$ ) were freshmen (23.1%) or sophomores (30.8%), with 50% females and 50% males. Confirming their novice status, 100% of students indicated they had no experience with Arduinos prior to the study.

### Design 12: Separate-Sample Pretest-Posttest Design

The pretest and posttest means for attitude, breadboarding and programming self-efficacy, and Arduino knowledge are presented in Table 1. Observed means for breadboarding and programming self-efficacy and Arduino knowledge were higher after the instructional treatment (group R<sub>B</sub>) than before (group R<sub>A</sub>), while the observed mean for interest slightly declined.

**Table 1**

*Pretest and Posttest scores for Interest, Breadboarding Self-Efficacy, Programming Self-Efficacy, and Knowledge*

Measure	Group A (pretest)		Group B (posttest)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Interest in learning about Arduino <sup>a</sup>	3.46	0.45	3.36	0.74
Breadboarding self-efficacy <sup>b</sup>	1.75	0.69	2.80	0.97
Programming self-efficacy <sup>b</sup>	1.96	.078	2.30	0.84
Knowledge about Arduino <sup>c</sup>	38.8%	17.3%	68.9%	19.1%

<sup>a</sup> Measured on a 1 - 5 scale where 1 = strongly disagree and 5 = strongly agree. <sup>b</sup> Measured on a 1 - 5 scale where 1 = very unconfident and 5 = very confident. <sup>c</sup> Percent correct on a 14 item test.

A one-way MANOVA, between-groups design was used to test the null hypothesis of no effect of the instructional treatment on any dependent variable (attitude, breadboarding or programming self-efficacy, and knowledge). The results indicated a significant difference between groups for one or more dependent variables, Wilkes' Lambda = 0.43,  $p < .001$ . Subsequent univariate ANOVAs indicated significant increases in after treatment scores (group R<sub>B</sub>) for breadboarding self-efficacy [ $F(1, 25) = 9.99, p = .004$ ], and knowledge [ $F(1, 25) = 16.60, p < .001$ ]. A large effect (Cohen, 1988) was noted for the instructional treatment for breadboarding self-efficacy ( $\eta^2 = 0.29$ ) and knowledge ( $\eta^2 = 0.40$ ). There were no significant differences for interest [ $F(1,25) = 0.18, p = .67$ ] or programming self-efficacy [ $F(1, 25) = 0.80, p = .38$ ].

## Design 2: One Group Pretest-Posttest Design

For group R<sub>A</sub> only, posttest scores were compared to pretest scores on each of the four dependent measures for students ( $n = 14$ ) completing all components of the study (Table 2). Observed mean scores increased for breadboarding and programming self-efficacy and for knowledge. The observed mean for interest decreased slightly from pretest to posttest.

**Table 2**

*Pretest and Posttest Scores for Interest, Breadboarding Self-Efficacy, Programming Self-Efficacy, and Knowledge*

Measure	Pretest		Posttest	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Interest in learning about Arduino <sup>a</sup>	3.46	0.45	3.35	3.35
Breadboarding self-efficacy <sup>b</sup>	1.75	0.69	3.00	3.00
Programming self-efficacy <sup>b</sup>	1.96	0.78	2.32	2.32
Knowledge about Arduino <sup>c</sup>	38.8%	17.3%	69.6%	17.4%

<sup>a</sup> Measured on a 1 - 5 scale where 1 = strongly disagree and 5 = strongly agree. <sup>b</sup> Measured on a 1 - 5 scale where 1 = very unconfident and 5 = very confident. <sup>c</sup> Percent correct on a 14 item test.

A series of four paired *t* tests were conducted to test the null hypothesis of no effect of the instructional treatment on any dependent variable (attitude, breadboarding self-efficacy, programming self-efficacy, and knowledge). Using the Bonferroni correction, the *alpha* level was established at .0125 *a priori* for each test in order to maintain an overall experiment wise error rate of .05 (Field & Miles, 2012). The results indicated a significant increase in posttest scores for breadboarding self-efficacy [ $t(14) = 6.42, p < .001$ ] and knowledge [ $t(15) = 5.92, p < .001$ ]. The Cohen's *d* for both breadboarding self-efficacy ( $d = 1.68$ ) and knowledge ( $d = 1.48$ ) indicated large effects (Cohen, 1988) for the instructional treatment. There were no significant differences in pretest and posttest scores for interest [ $t(15) = -0.76, p = .46$ ] or programming self-efficacy [ $t(14) = 1.60, p = .13$ ].

## Relationships between Project Rubric Scores, Interest, Self-efficacy, and Knowledge

On a percentage basis, rubric scores on breadboarding for all students ( $n = 26$ ) ranged from 20% to 100%, with a mean of 58.5% ( $SD = 24.0\%$ ). Rubric scores on programming ranged from 0% to 100%, with a mean of 23.5% ( $SD = 36.0\%$ ). As expected, there were significant positive correlations, ranging from moderate to very strong (Davis, 1971), between rubric scores, interest, self-efficacy, and cognitive test scores (Table 3). Breadboarding and programming self-efficacy were highly correlated ( $r = .83$ ) and there were very strong correlations between programming ( $r = .73$ ) and breadboarding ( $r = .77$ ) self-efficacy and interest in learning more about Arduino. Interestingly, actual breadboarding and programming achievement, as indicated by rubric scores, were not significantly correlated and had significant but lower correlations with interest in learning more about Arduino ( $r = .46$  and  $.45$ , respectively).

**Table 3**

*Intercorrelations between Rubric Scores, and Posttest Interest, Self-efficacy, and Cognitive Test Scores*

Variable	X1	X2	X3	X4	X5	X6
Breadboarding rubric score (X1)	1.0	.22 <sup>NS</sup>	.52 <sup>**</sup>	.52 <sup>**</sup>	.46 <sup>*</sup>	.59 <sup>**</sup>
Programming rubric score (X2)		1.0	.36 <sup>NS</sup>	.49 <sup>*</sup>	.45 <sup>*</sup>	.66 <sup>***</sup>
Breadboarding self-efficacy (X3)			1.0	.83 <sup>***</sup>	.77 <sup>***</sup>	.54 <sup>**</sup>
Programming self-efficacy (X4)				1.0	.73 <sup>***</sup>	.54 <sup>**</sup>
Interest in learning about Arduino (X5)					1.0	.53 <sup>**</sup>
Knowledge about Arduino (X6)						1.0

<sup>NS</sup>Not significant ( $p > .05$ ). <sup>\*</sup> $p < .05$ . <sup>\*\*</sup> $p < .01$ . <sup>\*\*\*</sup> $p < .001$ .

## Conclusions/Discussion/Implications/Recommendations

The results of both designs produced consistent results; a short-duration instructional treatment had significant, positive, and large effects in increasing novice Arduino users' breadboarding self-efficacy and overall Arduino knowledge, but no significant effect on either interest in learning about Arduino or programming self-efficacy. Breadboarding rubric scores (58.5%) were higher than programming self-efficacy scores (23.5%). Therefore, we posit that increased self-efficacy in breadboarding was a result of students' greater mastery and vicarious experiences for breadboarding; conversely, the lack of an increase in programming self-efficacy was due to students' lesser mastery and vicarious experiences for programming. This is consistent with theory (Bandura, 1986) and research (Erdil, 2019; Lee et al., 2014) on academic self-efficacy.

The significant positive intercorrelations between rubric scores and posttest interest, self-efficacy, and knowledge supported previous research (Thomas et al., 2011; Erdil, 2019; Lee et al., 2014) and suggested questions for further research. For example, programming ( $r^2 = .24$ ) and breadboarding ( $r^2 = .27$ ) rubric scores explained less than 30% of the variance in self-efficacy in

each respective area. Given that 100% of subjects were novice Arduino users, what other factors are related to self-efficacy in these areas? Further research is warranted, especially in light of the finding that breadboarding ( $r^2 = .59$ ) and programming ( $r^2 = .53$ ) self-efficacy were robust predictors of interest in learning about Arduino.

The results of this study have implications for teaching Arduino microcontrollers and related subjects to novice users in a college of agriculture. The instructional treatment consisted of 30-minutes of classroom instruction and a 50-minute hands-on activity. Based on the rubric results, and drawing on Vygotsky (1978) and Bruner (1978), it appears that many students were not sufficiently prepared to successfully complete the Arduino task when provided with only a single-page reference sheet and the program help menu for support. This was especially true for the programming task, supporting Lee et al. (2011) and Thomas et al. (2011). Thus, the instructional treatment should be extended in time and redesigned to incorporate increased instructional scaffolding (Wood et al., 1976), such as simplified breadboarding and programming tasks, provision of a partially completed program, the use of cooperative learning, or other methods. Research should be conducted to determine if an extended and redesigned instruction treatment increases mastery, vicarious, and social persuasion experiences, and leads to increased interest, self-efficacy, and learning, especially in programming, as suggested by both theory (Bandura, 1986) and previous research (Erdil, 2019; Lee et al., 2014).

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## **Internal Vs External Locus of Control's Effect on Learning Type In Agricultural Mechanics**

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## Introduction/Perspective

Projects and the use of projects as the tangible force for learning has been part of the school based agricultural educator's toolbox since the formalization of home projects by Stimson (Moore, 1988). The structure and core of many project-based learning programs is similar: (1) a driving question or problem to solve, (2) authentic, situated inquiry for students to explore the driving question, (3) collaborative activities between students, teachers, and community members, (4) educational scaffolds made up of technologies that assist students in growth, and (5) tangible products created by students that answer or address the original driving question (Krajcik & Blumenfeld, 2006). Each component plays a separate role in assisting students toward answering their driving question throughout the learning segment. Krajcik and Blumenfeld (2006) studied the roots of project-based learning and traced it back to John Dewey's work in his laboratory at the University of Chicago (1938). They built upon four ideas that influenced Dewey's work and have led to the rise in project-based learning: (1) active construction, (2) situated learning, (3) cognitive tools and (4) social learning. They explain active construction as part of the constructivist mindset, when students are able to construct their meaning and knowledge based on experiences and interactions with the world. They also stated that this is typically used to increase engagement and motivation toward the content. Auburn University found that their college undergraduates in construction programs saw enhanced learning and engagement when presented with an opportunity to participate in an active construction learning lab (Farrow & Wetzel, 2020; Wetzel & Farrow, 2021). Active construction often includes collaborative efforts by teams of students working towards a common goal. This higher quality instruction came from students' ability to better interact with the content.

Active construction is based on not only what students learn during their class segments, but it is also based on what background knowledge and experience students have prior to class. Increased prior knowledge has been shown to increase students' intrinsic goal orientation towards tasks (Araz & Sungur, 2007). Understanding what background knowledge students bring to actively construct new knowledge plays an important role, as does the meaning that students create for content between themselves, the teacher, and other students (Stein et al., 1994). Project-based learning exemplifies active construction by putting students into collaborative groups where they actively seek the answers to their driving questions and projects. In this study, researchers knew that some students had some level of experience with woodworking and metal fabrication, but they still had knowledge and space to learn through active construction of the project-based learning course.

Situated learning is seen as a major influencer in the creation of project-based learning (Krajcik & Blumenfeld, 2006). Situated learning states that students succeed when they learn skills in an environment authentic to the situation in which they will actually use the skill; it gives students an opportunity to generalize skills from the classroom to the real-world (Stein, 1998). The four pillars to situated learning include having experiences that mimic everyday situations, understanding that information learned can be transferred only to similar situations, knowing learning results from a social process, and that learning exists in a complex, robust, world full of many people, actions, and situations (Stein, 1998). Project-based learning is seen exemplifying situated learning because students are hypothesizing, testing, collecting data, and gaining knowledge through life-mimicking scenarios. Students gain experiences doing the actual tasks

and practicing the real skills in a mock environment that will be required of them in the post-classroom environment. In this study, students were utilizing the real tools, skills, and materials that will be required of them as they teach their own metal fabrication or woodworking class after graduation.

## **Theoretical Framework**

Bandura (1971) in his description of social learning theory suggests that man can avoid endless trial and error by observing others; by watching others go through fearful, joyful, pleasurable, or painful experiences, man can shape their own behaviors around those experiences. So not only does man learn through direct experience, but man can learn simply through observing others through their own experiences.

Based on the early work of Bandura, Rotter developed the concept of Locus of Control (LOC). Social learning theory asserts that life is a continuous cycle of behaviors and reinforcements both internal to the individual and externally viewed or experienced by that individual (Bandura, 1971; Rotter, 1966). Reinforcement can act to strengthen or deter people from repeating certain behaviors by experiencing them firsthand or watching others experience them (Bandura, 1971; Rotter, 1966). Rotter postulated that people have a tendency towards reliance on internal or external motivating factors (1966).

People who have an “internal” LOC tend to believe that there are more internal factors contributing to reinforcement/reward of behaviors (Rotter, 1966). Internal factors include one’s own characteristics or behaviors. Meaning that those with strong internal LOC believe they have a high level of control over the rewards/reinforcements available to them based on their own actions and behaviors. A study of academic success, standardized test scores, and grade point average found that students with an internal LOC had higher average grade point averages (Shepherd et al., 2006; Gifford et al., 2006). Another similar study found that students with an internal LOC had decreased academic procrastination, less test anxiety, and overall increased academic achievement (Carden, et al., 2004). One can conclude that students who had an internal LOC have a stronger sense of taking responsibility for the rewards and reinforcements that are available and happen to them. For students with an internal LOC, project-based learning provides the autonomy that allows students to control the rewards and reinforcements available to them. They can work on projects at their own pace as they search for the answer to their guiding questions.

People who have a tendency towards “external” LOC tend to believe that there are more external factors contributing to reinforcement/reward of behaviors than internal; external factors can include luck, fate, “powerful others”, or unpredictability (Rotter, 1966). Attributing rewards or reinforcements to those outside of one’s own self relinquishes some level of responsibility to those external factors for the rewards and reinforcements available. In studies of people with internal and external LOCs, students with external LOC struggled with decision-making processes due to lack of necessary information and/or inconsistent information (Kirdök & Harmon, 2018). Moreover, people with an external LOC were found to be more “helpless” than those with an internal LOC (Hiroto, 1974). Overall, people with an external LOC perceive a lack of control over the circumstances, rewards, and reinforcements available to them.

Typically, people tend to observe and act in situations based on their beliefs about their own LOC. LOC is foundational to how students interact with project-based learning because it determines how likely learners are to attribute their own behaviors and actions to the rewards or reinforcements (Rotter, 1966). LOC asserts that students who have an external LOC would be more likely to believe that their team members, the instructors, and other external factors would influence their success in the course. However, students with an internal LOC would believe that their own actions and skills would more influence their success in a project-based learning course. Project-based learning courses, due to their lower-structure and less instructor-guided instruction than lecture-based courses, give students much more control over their own learning process.

## **Objectives**

This study was organized around four main objectives, to describe a student's LOC, to describe a student's feelings towards project-based learning, to describe a student's feelings towards lecture-based learning, and to determine if a student's LOC effected their belief about project-based learning.

## **Methods**

This descriptive study used research methods as described by Gall et al. (2007). A questionnaire was used that was divided into four parts and delivered to students via the course learning management system (Canvas). Part one of the instrument consisted of 11 items using five-point Likert scale responses (1 = strongly disagree, 5 = strongly agree) that attempted to determine a student's overall feelings towards project-based learning. Part two was a similar section of 11 items using five-point Likert scale responses which sought to determine the students' feelings towards lecture-based methods. The third section was 29 binary response items based on the work by Rotter (1966) to determine a student's LOC. Part four utilized a five-point scale to inquire about student's overall comfort level working/learning in a shop-based environment. A reliability coefficient was calculated on the summated scale questions by construct, and it was determined that the instrument reach sufficient reliability to report the results (PBL construct 11 items,  $\alpha = .76$ ; Lecture construct 11 items,  $\alpha = .76$ ).

The target population for this study was all students taking an introduction level agricultural mechanics course at Auburn University in the fall of 2020. Open to all students in the university, this course is primarily taken by agricultural science students in both teacher preparation and non-teacher preparation tracks. There are aa minimal number of students from outside majors taking this course. The introduction to agricultural mechanics course was chosen because of its long-standing implementation of project-based learning as a primary teaching mode. Students in the course are given basic instructions on safety and safe operation of tools along with plans for various projects. Students are then guided through the construction of those projects. The projects and their plans are designed in such a way as to ensure the students experience the tools and systems outlined in the course objectives. Little direct instruction, outside of safety, is done in the course. Instructors are present as assistants and guides to the students but not as primary deliverers of information (Dewey, 1939).

This study yielded a census of students enrolled in an introduction to agricultural mechanics course ( $N = 38$ ) taught across three sections. The demographic makeup of the respondents were, female ( $n = 13$ ), male ( $n = 24$ ), ranging in ages from 20 - 34 with 21 being the most common response, most were not seeking teacher certification ( $n = 27$ ), most were either Juniors ( $n = 17$ ) or Seniors ( $n = 17$ ), and most had taken “shop” type classes in high school ( $n = 24$ ).

## Results/Findings

The results will be discussed by objective. The first objective was to describe students indicated LOC. Students predominantly expressed a medium to high LOC (Table 1). The higher the students scored on this instrument the more internal their LOC tends to be. Fifteen students expressed an internal LOC and 16 scored as having neither internal nor external. Only seven students indicated having a moderate or strong propensity towards and external LOC.

Table 1

LOC

Raw Score	<i>f</i>	LOC	<i>f</i>
1	1	Strongly E	1
3	1	Moderately E	
4	2	Moderately E	6
5	3	Moderately E	
6	4	Neither I nor E	
7	3	Neither I nor E	16
8	6	Neither I nor E	
9	3	Neither I nor E	
10	6	Moderately I	
11	1	Moderately I	12
12	4	Moderately I	
13	1	Moderately I	
14	2	Strongly I	3
16	1	Strongly I	
Total	38		38

Note. I = internal, E = external

Objective two was to describe a student’s feelings towards project-based learning. When a grand mean was calculated for the construct of project-based learning preference, students ( $n = 38$ ) showed a moderately negative opinion of project-based learning ( $M = 2.58$ ,  $SD = 0.79$ ) with a possible range of one to five. The largest group of students ( $n = 17$ ) construct score placed them in the middle of the scale ( $mode = 3$ ).

Objective three was to describe a student’s feelings towards lecture-based learning. Calculating a grand mean for the construct of lecture-based learning preference students ( $n = 38$ ) show a

strongly negative view towards lecture-based learning ( $M = 1.87$ ,  $SD = 0.78$ ) with a possible range of one to five.

Objective four was to determine if a student's LOC effected their belief about project-based and lecture-based learning. To achieve this objective a Pearson Correlation was calculated. LOC and feelings toward project based learning were not correlated in a statistically significant manner  $r(37) = -.258$ ,  $p > 0.05$ ). In addition a student's LOC score and feelings toward lecture based learning was also not correlated in a statistically significant manner to  $r(37) = 0.09$ ,  $p > 0.05$ ).

## **Conclusions/Discussion**

Rotter (1966) suggested that a person's LOC dictates whether that person had a propensity to treat the things external things as something they can more affect (internal) or something that can more affect them (external). The guiding thought of this research was to determine if LOC also has a bearing on a student's feelings towards the different course/teaching styles; project-based learning and lecture-based learning. It was found that students in the agricultural mechanics course were predominantly non-polar in their LOC with most scoring as neither internal nor external but leaning towards an internal LOC. Few students scored as having an external LOC. This fits with Rotter's understanding of Bandura's social learning theory (1971). People with internal LOC believe they view the world and control the portions of that experience into their understanding.

Using the understanding of LOCs relationship to social learning theory the supposition was that students who have a more internal locus of control would prefer to be taught using project-based learning methods because they would have more control over the outcomes and be able to easily affect change in their environment. While students on a whole did have more positive feelings about project-based learning then they did about lecture-based learning, these differences did not seem to correlate to their score on the LOC portion of the instrument. This could be due to an actual lack of correlation or could be caused by the misshapen data set due to uneven cell sizes. A larger sample or stratified sample needs to be taken to investigate if this lack of difference is real or if it was caused by the lack of adequate group sizes.

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**School-Based Agricultural Education Teachers' Current Level of STEM Integration**

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## **School-Based Agricultural Education Teachers' Current Level of STEM Integration**

### **Introduction, Purpose, and Objectives**

Science, technology, engineering, and math (STEM) preparedness is of growing concern across the United States (Bostic et al., 2020; Kuenzi et al., 2006), as students struggle to reach proficient levels in science and math (The Condition of College & Career Readiness, 2017; Wilmer, 2008). These current conditions beg the question, are teachers themselves prepared to teach STEM content within their curriculum (Hayes, 2017; Kuenzi et al., 2006)? School-based agricultural education (SBAE) is not exempt from this question, as McKim et al. (2017) illuminated the foundational connection of science across “all aspects of SBAE” (p. 107), providing practical application of the core content in the oldest science in the world (Ricketts et al., 2006).

Agricultural education has been described as providing a seamless avenue for the application and integration of STEM concepts (Smith et al., 2015). The body of literature is rich with examples pertaining to the integration of specific components of STEM integration within SBAE programs. Although, those focused on the integration of all four components of STEM within SBAE programs are not as vast. Researchers primary focus has been on the integration of science concepts into agricultural education curricula (Boone et al., 2006; Brister & Swortzel, 2009; Clark et al., 2012; Conroy et al., 2000; Haynes et al., 2012; Johnson, 1996; Myers & Thompson, 2006; Parr et al., 2006, 2009; Ricketts et al., 2006; Scales et al., 2009; Shinn et al., 2003; Smith et al., 2015; Stripling & Roberts, 2012; Swafford, 2018a, 2018b; Thompson & Balschweid, 1999, 2000; Thoron & Myers, 2012a, 2012b; Warnick et al., 2004; Whisenhunt et al., 2021). Findings consistently show SBAE teachers to feel most efficacious in their ability to implement science concepts into their curriculum (Haynes et al., 2012; Johnson, 1996; Ricketts et al., 2006; Scales et al., 2009; Smith et al., 2015) followed by mathematics, but lack in confidence to implement elements of technology and engineering (Eck et al., 2021, Wang & Knobloch, 2020).

SBAE teachers' prior educational experiences impact their perceptions of STEM integration (Stubbs & Myers, 2016). Trends within agricultural teacher education preparation programs are steeped in rigorous science-based coursework but lack the same rigor when it comes to advanced mathematics and/or engineering courses. “The lesser amount of engineering and mathematics integration described by the teachers suggested the two disciplines may need more attention from teacher educators and researchers” (Stubbs & Myers, 2016, p. 98). Additionally, today’s agricultural careers require a higher level of STEM comprehension and application (Stubbs & Myers, 2016). To better facilitate the preparation of preservice SBAE teachers, and meet the professional development needs of in-service teachers, analysis of current perceptions of STEM integration within the SBAE classroom must be done.

The need for SBAE to prepare students for college and career readiness is evident, but a gap in the research makes it difficult for teachers to integrate STEM curriculum in their agricultural classrooms (Stubbs & Myers, 2015). Therefore, the purpose of this study was to determine the current level of STEM integration in SBAE classrooms. Four research questions guided this study:

1. Determine SBAE teachers' current level of STEM integration.
2. Identify the career clusters SBAE teachers integrate STEM.
3. Explain the components of STEM commonly integrated by SBAE teachers.
4. Identify SBAE teachers' self-efficacy related to teaching STEM.

### **Theoretical/Conceptual Framework**

This study implemented the human capital theory to undergird the research, as the study aimed to determine the current level of STEM integration and the self-efficacy of the SBAE teachers. Specifically, the education, skills, experiences, and training (Becker, 1964; Little, 2003; Shultz, 1971; Smith, 2010; Smylie, 1996) an individual possess impacts their preparedness and competence in completing trade specific tasks (Heckman, 2000), which in the case of this study is teaching SBAE. Therefore, understanding the current level of STEM integration put forth by SBAE teachers and their preparedness to do so helps to identify the gaps related to the specific human capital needed by SBAE teachers (Robinson & Baker, 2013) to be effective teachers (Eck et al., 2021).

### **Methods and Procedures**

This exploratory, non-experimental survey research study aimed to reach SBAE teachers in Oklahoma ( $N = 467$ ) and South Carolina ( $N = 153$ ). One hundred and thirty-one SBAE teachers responded to the online questionnaire, 104 from Oklahoma and 27 from South Carolina, resulting in an overall response rate of 21.2%. The respondents were 65.2% male and 34.8% female, ranging in age from 22 to 66 years old. The majority (83.6%) of respondents were traditionally certified (i.e., agricultural education bachelors or master's degree with student teaching), 13.4% were alternatively certified, and 3.0% were emergency certified. The SBAE teachers ranged from first year teachers to those with over 35 years of experience, ranging from 59.7% with bachelor's degrees to 38.8% with master's degrees, and one reporting to have a PhD. The majority of respondents (53.7%) were in single teacher programs, while 38.8% reported to be two teacher departments, and 7.5% were three teacher programs.

A 16-item questionnaire was developed to determine the level of STEM integration currently in SBAE programs in Oklahoma and South Carolina. Four questions were utilized for each of the four STEM components, for example, for science, SBAE teachers were asked 1) Do you regularly integrate science in their agricultural classes?; 2) What classes do you regularly integrate science in?; 3) What components related to science do you regularly integrate in the listed classes?; and 4) What is your current level of self-efficacy related to teaching science in agriculture? The same question structure (i.e., four questions with a change in STEM component) was implemented for technology, engineering, and math. If respondents reported to not integrate a component per question one, they were prompted to answer why. In addition to the 16 items, six demographic questions (i.e., gender, age, certification pathway, SBAE teaching experience, highest degree earned, and number of teachers in program) were implemented to describe the participants.

Prior to distribution, the questionnaire was evaluated for face, construct, and content validity (Privitera, 2020) by two faculty members in Agricultural Education and one in the College of Education who focuses on STEM teaching and learning. The questionnaire was distributed via individual email address to 153 SBAE teachers in South Carolina and 467 SBAE teachers in Oklahoma. A total of four points of contact (i.e., initial email followed by three reminder invitations to participate) were utilized following the tailored design method to increase survey participation (Dillman et al., 2014). Following data collection, early (i.e., those responding following the first two contacts [ $n = 72$ ]) and late respondents (i.e., those responding following the last two contacts [ $n = 59$ ]) were compared based off the recommendations of Lindner et al. (2001). The comparison between the two groups resulted in no difference, therefore, the results of this study should be considered generalizable to the target audience of SBAE teachers in Oklahoma and South Carolina. Data were analyzed using SPSS Version 25 for this study.

### Findings

When asked if they regularly integrate each of the components of STEM (i.e., Science, Technology, Engineering, and Math) in their SBAE classroom, teachers most commonly integrated science, as 90.8% ( $n = 119$ ) of respondents indicated they regularly incorporate science. Adversely, engineering was the least common STEM component incorporated, with only 33.6% ( $n = 44$ ) integrating it in the SBAE classroom. Table 1 outlines the level of integration for each of the STEM components.

**Table 1**

*Frequency of SBAE Teachers Integrating STEM Components ( $n = 131$ )*

STEM Component	<i>f</i>	%
Science	119	90.8
Technology	76	58.0
Engineering	44	33.6
Math	66	50.4

Although many teachers identified integrating some STEM components, those who did not were asked why. When asked SBAE teachers responded with “I am not a science teacher”, “I am not familiar enough with the state science curriculum to make relevant connections”, “STEM is not currently integrated into the curriculum I am using”, or “I am not comfortable teaching these components”. Some respondents went on to say that teaching STEM “is someone else’s job” or that “[they] would but they do not know how”.

To address the second research question, individual courses were grouped by their identified career cluster specified by their state. SBAE in South Carolina and Oklahoma offers 29 different classes spanning seven career clusters, including ag communications, agribusiness and management, agricultural power, structures, and technology, animal science, food products and processing, natural resources and environmental science, and plant and soil science. In addition

to the 29 classes, three additional classes are available as introductory agricultural courses not specific to a career cluster. The frequency of science, technology, engineering, and math integration for each of the pathways is outlined in Table 2.

**Table 2**

*Cluster Specific STEM Integration for SBAE Teachers (n = 131)*

Career Cluster	Science	Technology	Engineering	Math
Agribusiness	0	1	0	0
Agricultural Communications	0	16	0	0
Agricultural Power and Technology	13	10	25	2
Animal Science	32	10	1	1
Environmental Service Systems	0	0	0	0
Food Science	3	0	0	0
Introductory Courses	61	22	4	6
Natural Resource and Environmental Science	11	2	0	2
Plant and Soil	26	5	1	5

The third research question aimed to explain the specific topics addressed within agriculture related to each of the STEM components. When prompted to answer what components related to science they regularly integrated in their agricultural curriculum, participants responded with genetics, anatomy, plant and animal cells, photosynthesis, animal breeding, chemistry of herbicides, the scientific method, plant classification, animal nutrition, and the scientific process of welding. Considering technology principles, SBAE teachers reported using computers, Google classroom, Canvas, Quizlet, iCEV, PowerPoint, Promethean boards, electronic record books, online curriculum, and computer software in general. A few teachers went past the technology integration for teaching and added the usage of CNC machines, drones, cameras, survey instruments, and pH testers. Engineering elicited responses including reading blueprints, metal fabrication, construction, surveying, project design, and small engine repair. The final component of math demonstrated teachers making connections to feed rations, mixing fertilizer, record keeping, calculating area, measurement, calculating slope, and compiling a cost list of building materials.

The final research questions asked SBAE teachers to report their level of self-efficacy related to teaching science, technology, engineering, and math from zero to 100, where zero was no self-efficacy and 100 was very high self-efficacy. Respondents ranged from SBAE teachers integrating STEM for the first time to those who reported to have been integrating STEM for over 35 years. Table 3 outlines the mean and standard deviation for teacher STEM self-efficacy for each of the components.

**Table 3***SBAE Teacher STEM Self-Efficacy (n = 131)*

Pathway	Mean	SD
Science	78.20	15.73
Math	75.62	19.05
Technology	74.29	18.36
Engineering	53.07	25.95

### Conclusions, Implications, and Recommendations

Science was the most commonly integrated STEM component, with 91% ( $n = 119$ ) of participating SBAE teachers reporting they regularly integrate science in their curriculum. Similarly, science has been found to be the most regularly integrated STEM component with pre-service SBAE teachers in multiple studies over the past 25 years (Boone et al., 2006; Brister & Swortzel, 2009; Clark et al., 2012; Conroy et al., 2000; Haynes et al., 2012; Johnson, 1996; Myers & Thompson, 2006; Parr et al., 2006, 2009; Ricketts et al., 2006; Scales et al., 2009; Shinn et al., 2003; Smith et al., 2015; Stripling & Roberts, 2012; Swafford, 2018a, 2018b; Thompson & Warnick, 2007; Thompson & Balschweid, 1999, 2000; Thoron & Myers, 2012a, 2012b; Warnick et al., 2004; Whisenhunt et al., 2021). Science being the dominant component further aligns with previous research referring to agricultural as the oldest science in the world (Ricketts et al., 2006) and an applied science (Balschweid & Thompson, 2000). In the case of this study, science was followed by lower integration levels with 58% ( $n = 76$ ) integrating technology, 50% ( $n = 66$ ) integrating math, and 34% ( $n = 44$ ) integrating engineering.

These levels of STEM integration align with recent research related to technology and engineering integration in SBAE (Eck et al., 2021, Wang & Knobloch, 2020), which outlined a lack of concern for technology and engineering as STEM components. Although only 50% of the participants reported integrating math, math enhanced curriculum in SBAE has been shown to significantly impact secondary students' math performance (Parr et al., 2006). Therefore, it is essential to further understand SBAE teachers' level of STEM integration, including the courses for each component of STEM.

Introductory agricultural courses (i.e., eighth or ninth grade ag, introduction to agriculture) were the most commonly reported cluster of integration for science, technology, and math. Whereas engineering was most frequently integrated in agricultural power and technology courses. Although much of the reported integration aligns with the career clusters, others resulted in little to no integration even though respondents reported teaching those courses. For example, no STEM integration was reported for environmental service systems and only one SBAE teacher reported integrating STEM in agribusiness, which was in technology. Overall, technology was reported to be integrated across the most career clusters of the STEM components (i.e., seven of the nine career clusters included technology).

Although technology was reported across the most career clusters, the technology integration focused on classroom technologies including computers, Google classroom, Canvas, Quizlet, iCEV, PowerPoint, Promethean boards, electronic record books, online curriculum, and computer software in general. Unfortunately, only a few SBAE teachers ( $n = 3$ ) went past the technology integration for teaching and focused on the integration of technology in agriculture, including the use of CNC machines, drones, cameras, survey instruments, and pH testers. Perhaps this is due to the nature of their training as they prepare to be certified teachers, focusing on teaching pedagogy and educational technologies? Additional research is warranted related to SBAE teachers understanding of the STEM technology integration in agriculture, as it was integrated across the most career clusters, even though respondents' technology self-efficacy resulted in a mean score of 74.3.

Overall, SBAE teachers reported themselves to be most efficacious in science, followed by math, technology, and engineering. This corresponds with science also being the most integrated item reported in this study. Additionally, many SBAE teacher preparation programs provide additional science emphasis or coursework in the undergraduate degree plans, as nearly 84% of respondents were traditionally certified. Although participants felt most efficacious in science, the mean score for self-efficacy of integrating science in agriculture was only a 78.2. This C grade in science self-efficacy is concerning considering the vast body of literature that has focused on science integration in SBAE (Boone et al., 2006; Brister & Swortzel, 2009; Clark et al., 2012; Conroy et al., 2000; Haynes et al., 2012; Johnson, 1996; Myers & Thompson, 2006; Parr et al., 2006, 2009; Ricketts et al., 2006; Scales et al., 2009; Shinn et al., 2003; Smith et al., 2015; Stripling & Roberts, 2012; Swafford, 2018a, 2018b; Thompson & Balschweid, 1999, 2000; Thoron & Myers, 2012a, 2012b; Warnick et al., 2004; Whisenhunt et al., 2021). Perhaps, additional resources need to be developed for both pre-service and in-service SBAE teachers to further understand and develop skills related to STEM self-efficacy and STEM integration.

Although this study is limited to SBAE teachers in Oklahoma and South Carolina, teacher preparation programs should consider the findings of this study as a potential need in their state related to SBAE teachers' preparedness to integrate STEM. Additionally, in-service teachers reported varying levels of STEM integration, leading to the need for a scaffold approach to professional development. This approach should consider the component of STEM (i.e., science, technology, engineering, and math) along with the career cluster focus (i.e., ag communications, agribusiness and management, agricultural power, structures, and technology, animal science, food products and processing, natural resources and environmental science, and plant and soil science), allowing teachers to determine the best fit for their current level of understanding and programmatic needs. To further support the development of purposeful STEM integration training for in-service SBAE teachers, this study should be replicated in other states to determine specific needs of teachers. Likewise, an adapted study should be implemented with pre-service teachers to evaluate the impact of coursework in their teacher preparation program on their preparedness to effectively integrate STEM during their clinical teaching experience and beyond. To further understand the level of STEM integration with SBAE teachers in South Carolina and Oklahoma, a qualitative focus group interview should be conducted to explore the current integration and barriers associated with STEM integration across career clusters.

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# **Was #EndSpeciesism a Fumble? An Investigation of the Public's Perceptions of PETA's Message Framing Strategy During Super Bowl LIV**

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## **Introduction and Literature Review**

Animal welfare and animal rights have been heated topics for years. The basic premise of animal welfare has been that animals should not be abused or beaten – a belief that the general public has primarily been accepted (Stephenson, 2019). Since its inception in 1980, the animal rights organization People for the Ethical Treatment of Animals (PETA) has defended animals' rights. PETA has operated under the premise that animals should have the right not to be experimented on, eaten, worn, used for entertainment, or abused in any other way (PETA, 2020a). The organization has accumulated more than 6.5 million supporters and has used celebrity influence as a core tenet of its communication strategy (Stephenson, 2019). In addition, PETA has also become well-known for its gut-wrenching and often gory images and videos of animals in its marketing campaigns. This approach evolved to include visual content in documentaries, videos featuring animal rescue, and misleading photographs of processing facilities (Deckha, 2008).

More recently, PETA has advanced a new ideology, called *speciesism*, in which they have argued that human dominance and power have led to the exploitation of animals for financial gain (Horta, 2010). As such, PETA framed speciesism as a social justice issue and called for action through a coordinated media campaign, called #EndSpeciesism, in which they have advocated for legislative changes at the local, state, and federal levels (PETA, 2020a). Because consumers have become less attached to agriculture and seemingly reliant on the media to receive information, it is important to understand how media campaigns could shape consumers' confidence in the agricultural industry (Ruth et al., 2005; Lundy et al., 2007). For example, negative media portrayals of agriculture, such as the #EndSpeciesism campaign, could pose significant threats to the industry that provides food, fiber, and fuel for the world.

On this point, Kirkpatrick (2017) reported that online videos had become a leading source of consumer impact for animal rights organizations. Through their social media platforms, PETA have worked to dismantle the public's understanding of animal welfare by using emotional icons and imagery that convey the notion that humans have systematically oppressed animals as an attempt to inspire public action (Fernández, 2021). This communication strategy has become known as *moral shock* (Jasper & Poulsen, 1995). Moral shock occurs “when an event or situation raises such a sense of outrage in people that they become inclined toward political action, even in the absence of a network of contacts” (Jasper & Poulsen, 1995, p. 498).

Many of PETA's advertisements for the #EndSpeciesism campaign have appeared to use moral shock to gain viewers' attention and encourage them to engage in the content. For example, in some online videos, PETA has used photographs of animals with begging eyes that pull on

viewers' emotions (Deckha, 2008). In other cases, the advertisements include images of "animals being brutally experimented on, abused, or slaughtered" (Atkins-Sayre, 2010, p. 310). PETA has also used visual rhetoric to encourage viewers to reexamine their perceptions. PETA's messaging has made the line between human and nonhuman animals ambiguous. However, it has remained unclear whether such messages help or hinder PETA's cause (Scudder & Mills, 2009). Therefore, a need emerged to examine the extent to which the visual communication strategies used by PETA during the *#EndSpeciesism* campaign have been effective in influencing the public's beliefs. This research supports the American Association of Agricultural Education Research Priority Area 1: Public and Policy Maker Understanding of Agricultural and Natural Resources (Enns et al., 2016) and provides agricultural communicators an understanding of how the public may respond to moral shock message framing.

### **Theoretical Framework**

To investigate PETA's *#EndSpeciesism* campaign, we used framing theory to guide this study (Gitlin, 1980). Media campaigns have used frames to make particular issues more salient than others for the public while also employing a unique angle (Entman, 1993, 2004). Framing analysis also allows researchers to better understand how an issue has been communicated, which results in a deeper understanding of how the public might view the phenomenon (Scheufele & Tewksbury, 2007). To accomplish this, media campaigns select specific content that makes a message more noticeable so that viewers can better (a) define problems, (b) consider causes, (c) make moral judgments, and (d) contemplate alternatives (Entman, 1993). Therefore, framing is a strategic act by which media campaigns curate an interpretation of an issue to encourage the public to identify, understand, and champion the cause moving forward. Framing not only exists in written content but also in visual media. Consequently, we used framing theory to examine the public's response to the metaphors, catchphrases, visual images, and moral shock strategies that PETA used during the *#EndSpeciesism* campaign.

### **Background of the Study**

Two days before the National Football League's (NFL's) Super Bowl LIV in 2020, PETA released a 60-second animated video (see <https://youtu.be/2XbCoOIEJ7s>) that promoted the *#EndSpeciesism* campaign on their YouTube account. PETA also shared the video across their various other social media platforms. However, in the weeks prior, PETA was denied a television airtime release of the video during commercial breaks of Super Bowl LIV (PETA, 2020b). As a result, PETA altered its plan and aimed to create a social media frenzy by framing the video through a social justice lens to suggest parallels between the *#EndSpeciesism* campaign and the *#BlackLivesMatter* movement (PETA, 2020b). For example, the video featured a bee buzzing to the tune of the U.S. National Anthem. As the bee flew across a forest, it passed many different animals that each *took a knee* in solidarity. This imagery paralleled the actions and images of former San Francisco 49ers quarterback Colin Kaepernick, who took a knee during the U.S. national anthem at NFL games as a way to call attention to police brutality and the *#BlackLivesMatter* movement (Boren, 2020). PETA's use of this strategic framing device could signal to viewers that supporting the *#EndSpeciesism* campaign was a social justice issue similar to the *#BlackLivesMatter* movement. Once released, the video garnered 3.9 million views, across all social media platforms in three weeks (PETA, 2020a).

## Purpose

The purpose of this study was to examine the public's perceptions of PETA's message framing strategy during Super Bowl LIV. One research question guided the investigation: What meaning did the public construct of PETA's video promoting its *#EndSpeciesism* campaign?

## Methodology

For this investigation, we used an interpretive, qualitative approach (Merriam & Tisdell, 2015). Interpretive research can help investigators understand how individuals assign meaning to beliefs, experiences, and problems in society (Merriam & Tisdell, 2015). To achieve this, we used purposive sampling to collect written narrative responses from 1,027 participants who were representative of the U.S. population. A web-based survey sampling company was used to achieve the non-probability sampling frame. Lamm and Lamm (2019) argued that non-probability sampling should be used when the population is difficult to define. This sampling approach was appropriate because we sought to understand how the public interpreted PETA's video promoting *#EndSpeciesism* (Lamm & Lamm, 2019). To meet the criteria for inclusion, we asked the participants to respond to a series of questions. The requirements for eligibility included: (a) at least 18 years old, and (b) a U.S. citizen. The web based survey sampling company also emphasized representativeness regarding age, sex, race, and geographic location based on U.S. Census data. The participants were also paid for participation to achieve quality, thought-provoking responses.

To collect data, we distributed a link that allowed the participants to view the PETA video promoting *#EndSpeciesism* and provide a narrative of their perspectives using a thought listing approach (Cacioppo et al., 1997). Thought listing has been used in agricultural communications research to help participants express their views on a phenomenon by responding to a writing prompt (Ruth et al., 2016). The writing prompt for this investigation was, "*We are interested in the thoughts and feelings that you experienced as you watched the video above. Please list your thoughts in the textbox below.*" Additional data sources triangulated the findings for this investigation. They included: (a) a demographic questionnaire and (b) a quantitative instrument that used a Likert-type scale. However, we only featured the qualitative data in this report. To analyze the data, we used Saldaña's (2021) procedures, by which we coded the data using two coding cycles. Saldaña (2021) described a code as "most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing or evocative attribute for a portion of language-based or visual data" (p. 5). In our first analytic cycle, we employed descriptive coding (Saldaña, 2021). This approach allowed us to inductively analyze the data by creating phrases that captured the meaning of the narratives submitted by the participants. Then, in the second coding cycle, we used axial coding to examine the relationships among the descriptive codes and reduce the data into distinct categories (Saldaña, 2021). After this process, we met as a research team to negotiate categories and discuss existing discrepancies in our analysis. Finally, we scrutinized our categories through the lens of framing theory (Gitlin, 1980). As a result of this process, four themes emerged.

We embedded Lincoln's and Guba's (1985) four standards for qualitative quality in this investigation to ensure rigor and trustworthiness. The first standard, *confirmability*, represents the level of transparency that researchers provide regarding their decisions. To achieve this standard, we provided an accurate description of our procedures and were upfront about the

decisions that could have affected this study's findings. Meanwhile, *dependability* reflects whether the research was conducted using a reliable, consistent approach. We upheld this quality standard by collecting data that aligned with the purpose of the study and were transparent about how our decisions influenced the interpretation of the data. The third standard, *credibility*, addresses whether the study's findings make sense when considered in context. We achieved this standard by triangulating our data with multiple sources. Finally, *transferability* speaks to whether the findings could provide implications for other contexts. In this investigation, we ensured transferability by obtaining a large, representative sample that reflected the U.S. population through the use of a web-based survey sampling company.

## **Findings**

Through our analysis of the data, four themes emerged: (1) animal rights, (2) visceral response, (3) questioning assumptions, and (4) context collision.

### **Theme #1: Animal Rights**

The most prominent concept articulated by participants was how PETA's framing of the video was designed to motivate changes to laws and regulations to ensure that animals obtained rights similar to humans. In particular, Participant #919 suggested that the video opened her eyes to how humans have "contributed to animal suffering" throughout history. In contrast, Participant #612 agreed that animals should have protections but not equal rights to humans. In many cases, participants' responses were ideological. For example, Participant #1011 maintained: "While I believe there should be some animal legislation and animals should have rights, they should not apply the same as they do to humans." The juxtaposition between support for animal welfare legislation and participants' disapproval of animal rights embodied this theme. Participant #421 described this conflict when viewing the commercial: "I have mixed feelings. I am in support of animals being treated right, but humans aren't even treated right. We should prioritize basic human rights before animal rights."

### **Theme #2: Visceral Responses**

The second theme described the range of emotions participants articulated while viewing PETA's *#EndSpeciesism* video. For instance, participants submitted polarized statements about human's mistreatment of animals and the emotional connection they felt after watching the video. As an illustration, Participant #864 explained: "I felt very sad after watching this video; we should care for other living things in this environment." Many participants also reported they felt an emotional connection because of PETA's use of the U.S. National Anthem. On this point, Participant #78 explained: "I was touched by this video and the way that it portrayed animals in a very human light. The National Anthem...added to this feeling. I honestly watched it in...wonderment and thought it was very meaningful..."

On the other hand, many participants described feelings of anger, frustration, and confusion. For example, Participant #512 said: "This was the dumbest ad I have ever seen. And the whole kneeling during the anthem thing just makes me angry. Animals are not the same as humans. I thought the video was absolutely ridiculous and confusing and weird." Another participant accused the video of comparing animal rights to the injustices experienced by racial minority

groups throughout U.S. history. Participant #18 explained: “It’s stupid and offensive. It is saying animal rights are the same as minority rights. It does nothing to further animal rights, it seems to be controversial only for attention, and it’s sad.” Meanwhile, other participants commended PETA for crafting a unique message in which the video’s content was not graphic.

### **Theme #3: Questioning Assumptions**

In the third theme, questioning assumptions, participants described how the video made them question its underlying political agenda. As such, the theme consisted of a range of positive and negative statements about patriotism and the political ramifications of PETA’s framing of the video. For example, Participant #334 said: “I liked the images [in the video], and I was amused to a certain degree with the idea of animals kneeling in protest, but at the same time I experienced some rejection or disgust with the idea because, considering the timing, it seems too political for animal rights.” In comparison, some participants expressed that they found it difficult to support the message in the video because of its politicized content and the timing of the video’s release. Participant #44 explained: “This ad was very political because taking a knee during the national anthem is very controversial right now. It also doesn’t have anything to do with animals and their rights. This took it very far, and I don’t think animals are equal to humans.” Similarly, Participant #971 articulated: “I completely disagree with the social and political commentary being made throughout the video as it was mainly from an agenda-based platform. I felt the video was attempting to perpetuate an agenda.”

### **Theme #4: Context Collusion**

Context collusion, the final theme, represented the intentional collapse, blurring, and flattening of contexts in the framing of PETA’s *#EndSpeciesism* video. As a result, this theme primarily consisted of what participants described as an inappropriate overlapping of contexts that the video perpetuated. The most prominent examples of context collusion were the conflation of the *#EndSpeciesism* campaign and the *#BlackLivesMatter* movement. On this point, Participant #167 described how the video made him uncomfortable. He expanded: “I thought that this ad was very political and did not need to copy a politicized movement. I felt a bit irritated by the message since I agree with it, but not with how it was presented and making the animals, especially the bald eagle, kneeling.” Meanwhile, Participant #812 suggested that the video’s framing was a missed opportunity. He argued: “I really get what PETA is trying to say here, but this just seemed like a bad way to do it. This only hurts PETA’s cause. As a believer in both animal rights and the Black Live Matter movement, this video just made me very sad.” Participant #258 also echoed this sentiment: “I think the message that animals should be respected is good, but I think that PETA should not be trying to piggy-back off another movement, and I don’t think the two movements should be equated. I think PETA’s message is important, but there has to be a better way to get that message across.”

Another issue regarding context collusion emerged when the video attempted to anthropomorphize animals, i.e., depict them with human characteristics. Many participants described distaste because the video depicted the animals as humans and insinuated that both were equal. For example, Participant #67 said: “I think anthropomorphizing animals is never really a good thing and is particularly off-putting in thinking about animals kneeling before a



flag. I think animals should have some rights but not the same as humans.” Likewise, Participant #309 described how such depictions were offensive and immoral. She maintained: “These are anthropomorphized depictions of animals, which gives people a false view of reality and makes light of a very serious issue found in the Black Lives Matter movement. Based on how this was done, I question the moral grounds that PETA stands on.” Nevertheless, some participants found meaning by depicting the animals in this way. And as a result, they reported they felt more connectedness to animals after viewing the video.

### **Conclusions, Discussion, Implications, and Recommendations**

This investigation examined the public’s perceptions of PETA’s message framing strategy during Super Bowl LIV. The findings of this study suggested that PETA’s video promoting its *#EndSpeciesism* campaign was primarily polarizing – a finding that does not appear to have been reported in the broader literature. While the video did succeed in gaining views and attention (PETA, 2020b), the strong emotional responses to the imagery was not necessarily positive. Participants perceived that PETA had inappropriately blurred contexts by conflating the *#EndSpeciesism* campaign and the *#BlackLivesMatter* movement, which resulted in a lack of trust in the organization. Therefore, as social injustices and human inequalities continue to be explored and potentially exploited in the media, it is critical to understand the public will likely approach this communication strategy with skepticism. As a result, several implications and recommendations emerged to guide future agricultural communication campaigns.

First, the findings of this study suggested that the public primarily viewed animal rights as secondary to human rights, which aligned with the findings reported by Scheufele and Tewksbury (2007). Therefore, we recommend that when framing video content, agricultural communicators should attempt to humanize the topic by using visual symbols and cues that align with the public lived experience, which could help them connect with the issue more intimately. However, in a moment-to-moment analysis of trust in agricultural messages, Lagrande et al. (2021) found that participants were uncertain of the ulterior motives when farmers or ranchers were delivering a message. Therefore, we recommend that agricultural messages in visual communication be delivered by an individual who appears to be unaffiliated with the industry and that could be viewed as relatable to the general public. Additionally, when developing content that will be delivered through mass media channels like television, communicators should avoid contentious or sensitive topics that might immediately offend half of their viewers due to political affiliation. When using symbolic metaphors and messages, care should also be taken that the perceived connection to agriculture does not diminish or minimize the the subject of inspiration, like the *#BlackLivesMatter* movement. Moral shock messaging might lead to increased reach for communication campaigns, but practitioners should not expect reception to be positive and for the campaign to lead to changes in attitude or behavior.

Although the participants described difficulty in supporting PETA’s video because of the anthropomorphizing of animals, we noted that some found this framing strategy enduring because it helped them establish an emotional connection between animal and human rights. Therefore, we recommend that research explore whether anthropomorphized depictions of animals could help convey agriculture’s message more evocatively in the future. Because trust was an issue that appeared to knit each theme together, we also recommend that future research

test message frames to promote more confidence in traditional production practices (Fischer, 2017). Future research could also explore how demographics would impact individuals' perceptions of the *#EndSpeciesism* campaign, specifically exploring associations with gender, rural/urban hometown, and political affiliation with message acceptance.

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# **A Historical Examination of Food Labeling Policies and Practices in the United States: Implications for Agricultural Communications**

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## **Introduction**

*“Now that I know how supermarket meat is made, I regard eating it as a somewhat risky proposition ...so I don't buy industrial meat” (Pollan, 2004, para. 6).*

The excerpt above from Michael Pollen’s (2004) book, *The Omnivore’s Dilemma*, has become more relevant as uncertainty among consumers mounts about how animal agriculture production practices occur in the U.S. (DeGregori, 2003; Hughner et al., 2007). Consequently, consumers have become increasingly invested in learning about where their food comes from, how it is harvested or processed, and the ingredients that compose the product (Bharat Helkar & Sahoo, 2016). Despite this, knowledge and understanding of agricultural practices have declined in recent years, resulting in consumers becoming more uncertain of where and how their food is produced as well as skeptical of food product marketing and branding (Heerwagen et al., 2014). As a result, the concept of agricultural literacy has become a significant theme in the literature over the past three decades (Frick et al., 1991; Hatesohl, 1971; Powell et al., 2008; Specht et al., 2014). Agricultural literacy is a subset of science literacy that refers to the level of knowledge an individual holds about agriculture (Mercier, 2015). Spurred by the work of the National Research Council (NRC), research has found that the average consumer lacks agricultural literacy and scientific knowledge, which, in turn, could have serious implications for the future of the agricultural industry (Duncan & Broyles, 2006; Olper & Swinnen, 2013).

Consumers have been inundated with various agricultural products in recent years (Muratore & Zarbà, 2011). Further, the relationship that consumers have with the food they consume and the how it was produced has become increasingly intricate (Jeong & Lundy, 2017). Consumer interest in food has surpassed taste alone and now includes concerns and interests on the social and ethical qualities regarding production (Briggeman & Lusk, 2011; Unnevehr et al., 2010; Zander & Hamm, 2010). Labels have been used for various reasons, including product differentiation (Ares et al., 2013). The FDA requires most foods to include nutrition labeling and to indicate nutrient and health claims to fulfill specific federal requirements (FDA, 2013). Beyond mandatory labeling, some manufacturers of food products choose to voluntarily include other information on their labels (FDA, 2018). According to the FDA (2018), the reason for this could be because some food companies believe that including this information could market their product better.

In marketing, however, perception is often reality, and in the case of food labels and consumer attitudes agriculture, this can be detrimental. Food labels have been defined as “any words, particulars, trademarks, brand names, pictorial matter or symbols on any packaging, document,

notice, board or collar accompanying or referring to a product” (Dubreuil & Agatiello, 2007, p. 41). However, if a label is to be deemed informative, consumers must have prior knowledge (Powers et al., 2020). Food products currently display more symbols and verbiage to indicate nutrition and health benefits than ever before (Nestle, 2010). Increased consumer demand for healthier, more sustainable, and ethically sourced food products has made food labeling progressively more important (Jeong & Lundy, 2017). Credible labels indicate the presence of desirable product attributes while simultaneously having the potential for brands to charge premium prices (McCluskey & Loureiro, 2003). The Pure Food and Drug Act (1906) prohibited companies from labeling their products with statements that were “false or misleading in any particular” (Pure Food and Drug Act, 1906, para. 3). Despite the risk of legal ramifications, food companies continued to list nutrient contents and claims of health benefits. With the marketing potential for food labels, the necessity of stringent regulations soon followed. In response, this historical narrative analyzed a reform effort that occurred in U.S. food labeling policy and practice throughout the 20th and 21st Century, which has dramatically contributed to the current food labeling issues and consumer distrust in the agricultural industry (Powers et al., 2020). Although each brand, company, and regulating entity has a unique approach and independent responsibilities for the labeling of food products, they also have fundamental commonalities. Describing how these trends have evolved motivated the current study.

### **Purpose and Research Questions**

The purpose of this study was to document the history of food labeling in the U.S. This research aligned with the American Association of Agricultural Education’s Research Priority Area 1: Public and Policy Maker Understanding of Agricultural and Natural Resources (Enns et al., 2016). Two research questions guided the larger investigation:

1. What policies have shaped food labeling in the U.S.?
2. What practices have shaped food labeling in the U.S.?

### **Methods and Procedures**

This study used a historical approach (Salevourious & Furay, 2015). “Historical research is the study of events, what people said or wrote, and trends that emerged. Such matters cannot be changed, but the evidence of them varies widely, and their description and interpretation are often revised”(Brooks, 1969, p. 2). In historical research, artifacts from the past can help advance new knowledge (Denzin & Lincoln, 1998). To accomplish this, we collected primary and secondary sources to ensure representation from a range of databases (McDowell, 2002).

Primary sources included: (a) legislative acts, (b) congressional reports, (c) official correspondence between Congress and food companies. Meanwhile, secondary sources included: (a) peer-refereed journal articles, (b) magazine articles, (c) books about food labeling. Finding multiple sources of data to triangulate our findings helped improve the study’s credibility (Tracy, 2010). The sources were also exposed to internal and external criticism by the researchers (McDowell, 2002). To analyze the data, we created a detailed outline to reveal the connectedness of data sources and their relationships to the study’s guiding research questions (McDowell, 2002). After documenting important themes and concepts, sources were placed into an outline and further scrutinized to unearth a deeper understanding of the historical foundations of food

labeling in the U.S. Further, the study's detailed outline provided a method to chronologically organize findings and ultimately gain an understanding of past food labeling policies and practices.

## Findings

### Research Question #1: What Legislation Shaped Food Labeling in the United States?

Since its early beginnings, the U.S. government has sought to intervene in the labeling of food products for the purpose of improving human health and safety (NALC, 2013). In the U.S., food labeling has historically been supervised by the United States Department of Agriculture (USDA), the United States Food & Drug Administration (FDA), and the United States Federal Trade Commission (FTC) (NALC, 2013). Housed within the USDA, the Food Safety and Inspection Service (FSIS) has been the public health agency responsible for enforcing labeling regulations regarding a country's commercial supply of meat, poultry, and egg products (FSIS, 2015). In response to public outrage following Upton Sinclair's (1905) book, *The Jungle*, the Food and Drugs Act (1906) was passed, which outlawed interstate commerce of misidentified or contaminated food items. Sinclair's vivid descriptions of unsanitary conditions in meat-packing plants coupled with depictions of spoiled meat shocked the American public. Because of its bold analysis of the low food safety and quality standards, *The Jungle* inspired the first of many policies that would aim to ensure a safe food supply.

The novel's plot followed a Lithuanian immigrant who sought the American dream but found work in a filthy, unsanitary meat processing facility. The novel was intended to raise awareness of the unfair working, living, and economic conditions that immigrants to the U.S. faced (Sinclair, 1906). As a result, the American public was outraged about the state of the food safety in processing facilities. The unsanitary working conditions, poorly ventilated plants, and meager wages that were also vividly described in the book. Prior to *The Jungle*, Sinclair was known for examining and writing about economic and social injustices and because of his discoveries in American meat-packing plants, became an accidental muckraker. To discuss his work and shed light on his experiences, President Theodore Roosevelt invited Sinclair to the White House (Constitutional Rights Foundation, 2008). The President then designated a team of commissioners to conduct comprehensive investigations of the five slaughterhouses in Chicago. In May of 1906, after inspecting meat-packing facilities, the special commission issued its report. The report corroborated nearly all the conditions that Sinclair had claimed. The commissioners recommended that inspections occur at slaughter to ensure animal health and at every stage of meat processing. Further, the commission called for the Secretary of Agriculture to create a policy that required "cleanliness and wholesomeness of animal products" (Constitutional Rights Foundation, 2008, pp. 16-17).

Despite opposition from meatpackers, Roosevelt enacted the Meat Inspection Act (1906). The policy authorized inspectors from the U.S. Department of Agriculture to intervene in interstate and foreign commerce and ensure that misbranded or spoiled meat did not enter the food supply (USDA, 1906). After the passage of the Meat Inspection Act (1906), Congress was able to pass laws that regulated the sale of most other foods and drugs. In fact, President Roosevelt concurrently enacted the Pure Food and Drug Act (1906). The Pure Food and Drug Act (1906)

provided regulation of food additives and prohibited the use of labeling that could be misinterpreted or deceptive. Consequently, the Pure Food and Drug Act (1906) inspired a need for a regulating agency and led to the development of the federal Food and Drug Administration (FDA) (Constitutional Rights Foundation, 2008). The two laws passed in 1906 ultimately increased consumer confidence in the foods they purchased. For decades, food packages have included indicative labels and nutrition messages to help consumers differentiate products and provide information about nutrition (Kees et al., 2014). However, in recent years, some lines have been blurred regarding whether some labels have been essential or unnecessary (Ikonen et al., 2020). The Nutrition Labeling and Education Act (1990) served as an amendment to the Federal Food, Drug, and Cosmetic Act (1938). This amendment instated the requirement that labels of most packaged food include a standardized nutrition label. Food manufacturers were then required to disclose nutritional attributes on labels and to undergo more stringent regulation by the FDA. For example, food companies could not make nutrient content claims if they had not met federal labeling criteria (Wartella et al., 2010). However, it should be noted that this statute did not regulate the labeling of meat and poultry products.

## **Research Question #2: What Practices have Shaped Food Labeling in the United States?**

Although policies have been in place regarding the criteria that must be included on food packages regarding food allergens and other health-related information, there has been little stipulation as to what could be printed on food labels (Wartella et al., 2010). Additionally, many third-party food brands have opted out of traditional USDA regulations and developed their criteria. Thus, an increasing amount of nutritional information that has been unregulated has used confusing jargon and aesthetically pleasing symbols that have been printed on the front of food packages (Wartella et al., 2010). One example of such a company has been Vital Farms.

Vital Farms operates under the core mission of bringing “ethically produced food to the table by coordinating a collection of family farms to operate under a well-defined set of organic agricultural practices that includes the humane treatment of farm animals as a central tenet” (Vital Farms, 2020). Through the marketing of this process, Vital Farms has encouraged consumers to adopt alternative egg choices rather than products from what they consider *harmful industrial practices*. The claims found on Vital Farms’ packaging have been emotionally driven and encouraged the consumer to form a mental image of the environment in which their products have originated. In addition to the claims on this brand’s package, this product used a Certified Humane Raised and Handled® label. To date, there has been no regulation of Vital Farms’ products by the USDA (Vital Farms, 2020).

Before the turn of the 20th century in the United States, a significant need for food labeling reform emerged. Known as *progressives*, those who led the reform aimed to address economic and social issues caused by the rapid growth of food manufacturing factories (Constitutional Rights Foundation, 2008). During this time, progressives attacked corporations such as Standard Oil, U.S. Steel, and the Armour meat-packing companies for what they described as *unjust practices* (Constitutional Rights Foundation, 2008). The progressives argued that these companies destroyed free enterprise, controlled market prices, and did not treat workers fairly (Constitutional Rights Foundation, 2008). The progressives struggled to find common beliefs on how best to address such issues. As an illustration, some progressives envisioned breaking up



large corporations with laws that evened the financial playing field, while others thought that government intervention could provide more value. This movement ultimately called for the identification of better food labeling practices by food companies.

In response to progressives' unrest, U.S. food manufacturing companies began using an advertising strategy called Front-of-Package Nutrition Labeling, to include nutrient content and health claims (FDA, 2009). As a part of its authority over labeling, the FDA oversaw food labeling regarding the following key areas: (1) ingredients (listed in order of prominence), and (2) nutrition facts such as serving size, calories, fat, carbohydrates, sodium, protein, nutritional content (e.g., low fat, high fiber, high fiber), health claims, raw fruits, vegetables, fish, and allergy information (FDA, 2009). To provide more consumer education, the FDA (2016) also modified the guidelines for Nutrition Fact labels. In addition to marketing tactics for food products, brands have also used value-added product attributes and terms (Batte et al., 2007; Gadema & Oglethorpe, 2011; Loureiro & Umberger, 2007). These labels have included terms that have indicated superior production (e.g., Organic and Certified Naturally Grown), the absence of additives (e.g., Non-GMO and Gluten-Free), as well as indicators of social and high animal welfare standards (e.g., Carbon Trust, Fair Trade, and Certified Humane) (Gadema & Oglethorpe, 2011).

Despite policymakers' intentions, food labels have been limited in their effectiveness in recent years because consumers have often interpreted the information as unclear (Ben-Shahar, 2016). A developing body of literature has addressed that food labels are multidimensional components of food marketing and are displayed on food packages in a variety of different formats that inform consumers about more than just food quality attributes (Hieke & Taylor, 2012; Kiesel et al., 2011). As a result, food label elements such as graphic design, colors, and font choice have emerged as essential to gaining consumers' trust (Shen et al., 2018). However, more research is necessary to determine consumer knowledge and perceptions of food labeling and the future of the food labeling industry. As a result, agricultural communicators could play a main role in the progress of the food labeling movement in the future (Powers et al., 2020; Shen et al., 2018).

### **Conclusions, Discussion, Implications, and Recommendations**

Today our world demands sustainability and transparency from the agricultural industry (Food and Agriculture Organization of the United Nations, 2017, p. 3). Consumers are more concerned now than ever before about producing, manufacturing, and marketing their food. Public perceptions of production agriculture have hinged on animal husbandry, biotechnology, and the lack of pesticides, herbicides, and added hormones (OECD, 2012). Based on the findings of this investigation, we conclude that food labels were initially intended to provide consumers with a deeper knowledge of the food they purchased. However, key legislative acts such as the Nutrition Labeling and Education Act (1990) shifted the food labeling movement into a branding device to differentiate products and brands from one another – a finding that aligns with previous research (Dubreuil & Agatiello, 2007; Nestle, 2010).

The overwhelming amount of information on food labels appears to have contributed to consumer confusion (Kees et al., 2014). Although third-party brands, such as Vital Farms, have developed their own standards for food labels, we conclude that their efforts to educate

consumers have been negligible. Further, we also conclude that third-party labels' consumer education programs have not benefitted the agricultural industry – a finding that is not currently reflected in the broader literature. Despite this, Kumar and Kapoor (2017) reported that consumers have been concerned about methods of food production and raising environments of livestock. Protein consumption has been a significant component of Americans' diets in the last decade. As such, it is vital to evaluate and understand consumers' perceptions of animal agriculture and, more specifically, the conventional and modern raising standards by which livestock animals have been raised. We recommended that agricultural practitioners explore new ways to communicate this message more effectively. Previous research has shown that consumers trust producers as sources of information (Pew Research Center, 2016). We call for producers incorporate more personal and emotional appeals when marketing agricultural products to better compete with third-party branding efforts.

Consumers also desire food brands' values and meanings to be communicated more explicitly (Wee & Ming, 2003). Thus, it is advisable that marketers of agricultural products should develop modern branding strategies for traditional products. Muratore and Zarbà (2011) found that the package design of food products has also been a critical factor in purchasing decisions. We conclude that the findings of this study contributed to knowledge regarding the need to reevaluate and possibly amend food label laws and regulations. We suggest that agricultural communicators and advocates begin to reexamine food labeling policy to determine the necessary changes that could be made to create a more transparent future. We also conclude that one of the most notable differences between the past and the present regarding food labeling and consumer concern has been the volume of information. In the early 1900s, consumers had very little access to information. When consumers learned about food production practices through Sharpton's novel, *The Jungle*, they were repulsed and disappointed. In contrast, the modern consumer has been presented with so much information that it has made it difficult to distinguish between truth and fallacies. Moving forward, we recommend that future research in agricultural communications explore how food companies can better establish trust with consumers through the food labels they encounter.

Based on the findings of this investigation, food labeling research should also explore the knowledge and perceptions of consumers who fall into contrasting age categories. Evaluating how or if those perceptions vary could help determine if food marketing strategies have been biased to younger audiences. This knowledge could help food companies better understand such differences and adapt their food marketing and labeling options accordingly. A large portion of consumers in the U.S. have been disconnected from agriculture and farming (Frick et al., 1991). Packaging and labeling have fundamental roles in ensuring the safe delivery of goods through a supply chain to the end consumer that adequately informs them of the product's contents (Hurley et al., 2013). The evidence presented in this historical investigation illuminated a disconnect between food manufacturers and governing agencies' labeling policies. Therefore, industry professionals should advocate for agricultural literacy among youth to encourage better-educated consumers. Consumers deserve to know what they are buying, where it comes from, the nutrients of each product, and to be assured it has met USDA quality and safety standards. Currently, loopholes in food labeling policy have made it possible for misleading labels to be used on a variety of food products (Constitutional Rights Foundation, 2008). Consequently, these issues warrant more attention in the future.

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## Predicting Agricultural Sciences Students' Media Literacy in a Post-Truth Era

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Media plays an integral role in most individuals' daily lives. Media literacy changes the way consumers digest the information they receive, and when taught media literacy, students become more critical consumers of information (Maksl et. al, 2015). Especially in relation to news media, there has been increasing evidence that formally teaching media literacy to college students has inherent value: enhancing critical thinking skills, students' trust in the media, conscious processing of media messages, etc. (Maksl et. al, 2015). Currently, there is a media literacy crisis. Students struggle to find reliable and credible information because they do not understand how information is shared and shaped via the media (Miles et. al, 2017). This inability to distinguish between accurate and inaccurate information in the news has been further exacerbated by what is being called the *post-truth era* in politics, where communication is not necessarily marked by lies, but the truth is no longer essential to political conversations (Buffacchi, 2020). At the same time, there has been a growing trend of skepticism toward the news media as people question the bias and quality of information they receive (Gallup, 2020; Gottfried & Funk, 2017). The public's reliance on mass media to learn about science, and their inability to distinguish between accurate and inaccurate news, may also threaten science and agricultural literacy in society (Gottfried & Funk, 2017).

In addition to mass media, people also gather information from basic search engines, and most will immediately deem it credible (Miles et.al, 2017). However, information can often be miscommunicated, which leads to a misinformed public (Miles et.al, 2017). Therefore, there is a need to increase the public's media literacy to allow them to better decipher the quality of scientific information they received in the news, thus increasing science and agricultural literacy. Research has demonstrated students who completed formal higher education instruction about media and news media literacy were better equipped to decipher media messaging and were deemed media literate compared to their non-course-taking counterparts (Maksl et.al, 2017).

Agriculture students are uniquely situated to communicate information about the production of resources that directly impact daily life, yet during instruction, media literacy is often neglected. While there have been courses taught on the perception of agriculture in entertainment media (Specht, 2014), formal classroom instruction dedicated to media and news media literacy for college of agriculture students has been slim. Research has suggested agriculture communications curriculum has historically not prioritized media literacy (Leal et.al, 2019; Leal et al., 2020). If agricultural sciences students lack media literacy skills after graduation, they will encounter their own issues with sharing credible information in the future related to their discipline. In accordance with priority number three of the national research agenda to produce a "sufficient scientific and professional workforce that addresses the challenges of the 21<sup>st</sup> century" (Stripling & Ricketts, 2016, p. 29), this research sought to explore the predictors of agricultural sciences students' media literacy.

### Conceptual Framework



Need for cognition (NFC) in relation to media literacy provided the conceptual framework for this study. Need for cognition refers to the extent an individual enjoys engaging in effortful critical thinking (Cacioppo & Petty, 1982). Individuals with a high NFC typically enjoy engaging in problem-solving, analyzing in-depth information and achieving challenging goals (Hawthorne et al., 2021). Motivation, specifically intrinsic, is critical in education and how one is inspired to learn resulting in higher academic achievement (Hawthorne et al., 2021).

Knowing the impact that motivation has on academic achievement can help improve media literacy education and foster skepticism toward information in the media, rather than cynicism (Vraga & Tully, 2021). Education pertaining to media literacy is important for individuals to evaluate and identify their knowledge, attitudes and beliefs that will assist them in identifying partisan misinformation, and ‘fake news’ that has not been verified (Vraga & Tully, 2021). Society becoming more reliant on news media sources and social media has increased awareness of misinformation and skepticism that has led to higher media literacy as individuals seek news from more trusted sources (Vraga & Tully, 2021). According to Hawthorne et al. (2021), each individual processes information differently; therefore, when trying to improve media literacy through education, it is important to address the question: “How should we help students learn?” (Hawthorne et al., 2021, p.4). The answer is implementing a high NFC so that individuals enjoy critical thinking when they evaluate media, thus enabling them to distinguish credible information from misinformation (Vraga & Tully, 2021).

Vraga and Tully (2021) found individual’s skepticism toward news media was related to their news media literacy, perceived value of news media literacy, and NFC. The researchers suggested that in order to address the spread of misinformation, media literacy and the value of media literacy for democracy needed to be emphasized in education to help “promote healthy skepticism towards news while avoiding cynicism that leads to disengagement and distrust,” (Vraga & Tully, 2021, p. 160). Some of the distrust associated with the media has been linked to the spread of misinformation on social media (Bessi et al., 2016; Garrett, 2017), which is the platform most young adults use to learn about the news (Gottfried & Shearer, 2017). While media literacy efforts may prepare members of society to better critically evaluate information they receive in the news, there is still a need to better understand media literacy for the 21<sup>st</sup> century (Vraga & Tully, 2021).

### **Purpose & Objectives**

The purpose of this research was to explore the predictors of agricultural sciences students’ perceived media literacy. The following objectives guided this study: (1) Describe where agricultural sciences students get their news; (2) Describe agricultural sciences students’ perceived media literacy, perceived value of media literacy, trust in the news media, and NFC; and (3) Predict how perceived value in media literacy, trust in the media, and NFC predict agricultural sciences students’ perceived media literacy.

### **Methods**

To fulfill the purpose of this study, an online survey was distributed to students enrolled in an agricultural communications class at the University of Nebraska-Lincoln (UNL). This survey was part of a *Literacy Reflection* assignment given at the beginning of the semester where students were asked to answer questions related to agricultural literacy, science literacy, and

media literacy and write a reflection about their scores. The data in this study was collected from a pilot sample of UNL students enrolled in a 300-level agricultural communications class at the beginning of the 2021 fall semester. This class served both agricultural communication and non-agricultural communication students and did not require a communications pre-requisite to register.

There were a total of 30 students who agreed to participate in the study ( $n = 30$ , 100% participation rate). The majority of the students were juniors (73.3%,  $n = 22$ ), followed by seniors (23.3%,  $n = 7$ ) and sophomores (3.3%,  $n = 1$ ). Most of the students reported coming from a rural hometown (76.7%,  $n = 23$ ), and 46.7% ( $n = 14$ ) reported their family's primary source of income came from agricultural practices. Approximately half of the class majored in agricultural communications (46.7%,  $n = 14$ ) and the other half were non-agricultural communication majors (53.3%,  $n = 16$ ). These non-agricultural communications students majored in animal science, agricultural economics, and agronomy for example. Questions related to race/ethnicity and gender were omitted to protect the confidentiality of the respondents due to the small sample size. Additionally, questions like political value were omitted because the lead researcher for the project was also the course instructor, and this question may have made respondents feel uncomfortable.

The survey instrument consisted of 45 questions asking about media use and engagement, science literacy, agricultural literacy, media literacy, and demographics. Questions pertaining to media use, perceived media literacy, perceived value of media literacy, trust in the media, and need for cognition were examined for this study. The survey first asked respondents where they primarily received their news in an average week and asked respondents to check all that applied from the following list: national TV news, local TV news, national newspaper, local newspaper, social media, podcast, email listserv, or word of mouth from friends, family, etc. If respondents selected "Social Media" they were given a follow-up question asking about which specific platforms they used to receive news.

Perceived media literacy was measured with a 4-item, 5-point Likert-type scale (Vraga & Tully, 2021). The following labels were used for the scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *strongly agree*. Items included statements like, "I have the skills to interpret media messages" and "I am confident in my ability to judge the quality of the news." The scale's initial reliability fell below the acceptable threshold of a Cronbach's alpha of .70 or higher (Cronbach's  $\alpha = .63$ ; Field, 2013), but the deletion of one item increased the reliability to a Cronbach's alpha of .70. The construct was created by taking the average of the three remaining items. Perceived value of media literacy was also adapted from the Vraga and Tully (2021) study and consisted of eight items on a 5-point Likert-type scale with the same labels as perceived media literacy. Examples of items included, "Media literacy is important for democracy," "It is the role of the press to represent diverse opinions," and "People need to critically engage with news content." The reliability for this scale was also initially problematic (Cronbach's  $\alpha = .68$ ), but the deletion of one item increased the reliability. The average of the remaining seven items was calculated to create the construct (Cronbach's  $\alpha = .72$ ).

Trust in the media was measured using an 8-item, 5-point Likert-type scale with the same labels as previously described. This scale was adapted from an instrument that Maksl et al. (2015) developed and included items like "I don't think the news can be trusted" and "I think the news

media tell the whole story.” The responses were coded so that distrust in the media was a one and trust was a five. The average for the items were used to create the construct (Cronbach’s  $\alpha = .80$ ). Need for cognition was measured with four items on a 5-point Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Examples of items included: “I prefer complex to simple problems” and “I try to avoid situations that require a lot of in-depth thinking about something,” (Vraga & Tully, 2021). Statements were coded so that a high NFC was a five and a low NFC was a one. One item was deleted due to a low initial reliability (Cronbach’s  $\alpha = .69$ ). The average for the remaining three items was calculated, and the construct was reliable (Cronbach’s  $\alpha = .71$ ). To aid in the interpretation of the data, real limits were created and were as follows (Sheskin, 2004): 1.00 – 1.49 = strongly disagree, 1.50 – 2.49 = disagree, 2.50 – 3.49 = neither agree nor disagree, 3.50 – 4.49 = agree, and 4.50 – 5.00 = strongly agree.

All data were analyzed in Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were reported for objectives one and two. Multiple linear regression analysis was used for objective three. Perceived media literacy served as the dependent variable for the model and perceived value of media literacy, trust in the media, and need for cognition were included as predictors based on prior literature (Vraga & Tully, 2021). Due to the small sample size of 30, the model was limited to three predictors (one per 10 responses; Statistics Solutions, 2021). All variables in the model were continuous and were normally distributed with a skewness and kurtosis between +/- 2. Threat to multicollinearity was not identified for the model – the variance inflation factor (VIF; range of 1.04 to 1.23) and tolerance (range of .81 to .97) were within acceptable limits (Bowerman & O’Connell, 1990; Menard, 1995). Therefore, assumptions were met for the multiple linear regression analysis (Field, 2013).

## Findings

### Describe Where Agricultural Sciences Students Get Their News

The majority of respondents reported getting their news from social media (90.0%) and word of mouth (86.7%) in an average week (Table 1). About half of the respondents received their news from local TV channels (53.3%), and a minority of respondents received their news from other channels like podcasts (26.7%), national newspapers (6.7%), and email listservs (6.7%).

**Table 1**

*Where respondents get their news in an average week*

Media Channel	%(f)
Social Media	90.0 (27)
Word of Mouth from Friends, Family, etc.	86.7 (26)
Local TV News	53.3 (16)
National TV News	26.7 (8)
Podcast	26.7 (8)
Local Newspaper	20.0 (6)
National Newspaper	6.7 (2)
Email Listserv	6.7 (2)

Respondents who indicated they received news from social media were asked to select which social media platforms they use in an average week (Table 2). Respondents were most commonly receiving the news from Facebook (70.0%), Instagram (33.3%), and Twitter (33.3%).

**Table 2**

*What social media platform respondents use to get their news in an average week*

Social Media Channel	%(f)
Facebook	70.0 (21)
Instagram	56.7 (17)
Twitter	33.3 (10)
TikTok	30.0 (9)
Snapchat	26.6 (8)
YouTube	10.0 (3)
Other	0.0 (0)

### **Describe Agricultural Sciences Students' Perceived Media Literacy, Perceived Value of Media Literacy, Trust in The News Media, and NFC**

Respondents agreed they perceived themselves to be media literate ( $M = 3.78$ ;  $SD = 0.46$ ) and that they valued media literacy ( $M = 4.02$ ;  $SD = .49$ ). However, they disagreed they trusted the news media ( $M = 2.30$ ,  $SD = 0.57$ ). Additionally, respondents reported they neither agreed nor disagreed they had high NFC ( $M = 3.29$ ,  $SD = 0.78$ ).

### **Predict How Perceived Value in Media Literacy, Trust in the Media, and NFC Predict Agricultural Sciences Students' Perceived Media Literacy**

The regression model predicting respondents' perceived media literacy was statistically significant and could account for 41% of the variance in perceived media literacy ( $R^2 = .41$ ;  $F(3,25) = 5.86$ ,  $p < .01$ ). The only significant predictor in the model was NFC, and as it increased one point, perceived media literacy increased .38 points ( $b = 0.38$ ,  $p < .01$ ). Trust in the media ( $b = 0.11$ ,  $p = .41$ ) and perceived value of media literacy ( $b = 0.20$ ,  $p = .20$ ) were not statistically significant predictors of perceived media literacy.

### **Conclusions, Implications, & Recommendations**

The purpose of this study was to explore the predictors of agricultural sciences students' perceived media literacy. While the findings from this research are not generalizable beyond this pilot sample, they still provide valuable insight into students' media literacy. Respondents were not actively engaging with traditional news media, like television and radio, and were most commonly receiving the news from social media, like Facebook, or personal connections, which aligned with prior research (Gottfried & Shearer, 2017). Despite respondents agreeing they possessed and valued media literacy, their trust in the media remained low. This low level of trust in the media may stem from the students' use of social media sources for news, which may not provide fully accurate information (Bessi et al., 2016; Garrett, 2017). Based on the questions asked in this study though, it is difficult to assess if the low levels of trust reflected healthy skepticism or damaging cynicism toward the news media (Vraga & Tully, 2021). Despite prior research establishing a relationship between skepticism of the media and media literacy (Vraga

& Tully, 2021), trust in the media was not a predictor of perceived media literacy in the regression model. The model had a medium effect size (Cohen, 1988), but the only predictor was NFC. For this sample, increased NFC led to increased levels of perceived media literacy, which was a similar finding to past research (Vraga & Tully, 2021).

Skills like media literacy and NFC have not been traditionally prioritized in agricultural communications curriculum (Leal et. al, 2019; Leal et al., 2020). With the increased spread of misinformation in the news (Gallup, 2020; Gottfried & Funk, 2017) coupled with the emergence of the post-truth era in politics (Buffacchi, 2020), it is critical that agricultural sciences students possess the ability to critically evaluate information they see in the news related to agriculture and science. Therefore, understanding students' news media use and predictors of perceived media literacy will aid educators in the development of a targeted curriculum to enhance agricultural sciences students' media literacy. Because students recognized the value of media literacy in society, they would likely see the value of this type of curriculum and would be willing to engage in the content. Teaching about the production of the news and the role of the media for democracy may also help to increase students' trust in the media without encouraging further cynicism.

To help supplement media literacy curriculum, agricultural colleges should consider placing emphasis on increasing students' NFC. Because reading comprehension is the foundation of building media and information literacy skills, first year undergraduate students should be reading and analyzing complex texts to better understand science, so they are able to build upon their media literacy foundation throughout the remainder of college (Miles et al., 2017). Agricultural college faculty should have a responsibility in developing students' NFC as post-secondary education can help fill the gap in the current media literacy crisis. Simply enhancing NFC and enabling students to critically examine the media can help boost media literacy skills. Faculty members can teach students to collect authentic information by conducting their own academic research and finding credible sources of news information (Miles et al., 2017), which would encourage students to use additional news sources beyond social media. Students obtaining a high NFC and enjoying effortful critical thinking will help them improve upon their media literacy skills going forward, which would also improve science literacy skills in society.

The data analyzed in this study were from students who were enrolled in an agricultural communications class, and half of the class were agricultural communications majors, which may have skewed the results. To gain a more in-depth understanding of agricultural sciences students' media literacy and the current media literacy crisis, it would be valuable to collect the same data on a more diverse group of students from a variety of backgrounds and majors. Additionally, future research should include a larger sample for the study to allow for additional, relevant predictors to be added to the model, like social media use, major, and political ideology. Because only perceived media literacy was measured, asking questions related to actual media literacy based on knowledge questions may yield more nuanced findings. Further exploring trust in the media, and whether it reflects skepticism or cynicism of the news, would also be beneficial in developing future curricular efforts around media literacy. Because this study served as a pilot, it should be replicated at other universities to better understand predictors of agricultural sciences students' media literacy and to increase the generalizability of the findings.

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**Perception of Alabama and Georgia Local CTE Administration on Integration of  
Employability Skills into Agricultural Education**

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### **Introduction, Purpose, and Objectives**

Providing students with the necessary skills to be successful in the workforce is a basic function of modern education (Symonds, et al., 2011). Unfortunately, industry leaders have reported that there is a technical and employability skills gap among young adults (Casner-Lotto, et al., 2006; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008). In fact, 73% of employers claim that they have issues finding qualified employees who value their organization and 51% of employers claim that “education systems have done little or nothing to help address the skills shortage” (Society for Human Resource Management [SHRM], 2018, par. 8). In addition, 42% of employers claim that high school graduates are not prepared for an entry level job (Casner-Lotto et al., 2006).

This skills gap is currently an issue with young adults of all educational levels, including high school graduates, technical school graduates, and college graduates (Casner-Lotto et al, 2006; Hendrix & Morrison, 2018; Easterly III, et al., 2017; Ramsey & Edwards, 2012). Although this skills gap effects a multitude of industries, the agriculture industry is not immune (Easterly III et al., 2017; Hendrix & Morrison, 2018). If the agriculture industry is to continue to provide a safe and efficient food supply, a prepared workforce is crucial (Goerker et al., 2015).

The most common solution posed to close the skills gap is increased education on employability skills through Career and Technical Education (CTE). As agricultural education and CTE continue to evolve and adapt to the 21st Century, continuance and improvements to the instruction on employability skills and STEM skills will be necessary to ensure the development of a successful and prepared workforce.

The purpose of this study was to assess the perceptions of CTE administrators in Alabama and Georgia on how agricultural education teachers are integrating employability skills into agricultural education. The following research questions were assessed:

- 1) What were the demographic characteristics of CTE Administrators in Alabama and Georgia?
- 2) To what extent did CTE administrators in Alabama and Georgia regard the importance of the integration of specific employability skills into SBAE curriculum?

### **Conceptual Frameworks**

The conceptual framework used to guide this study was the Perkins Collaborative Resource Network (PRCN) Employability Skills Framework (PRCN, 2018). This framework depicts the areas of employability skills that students need to develop to be successful in the workforce. The perception of CTE administrators on the integration of employability skills into agricultural education can shed some light on the quality of integration.

There are numerous models that promote employability skills integration, but the most common and most relevant to this study are Work Based Learning (WBL) and the simulated workforce classroom (The National Council for Agricultural Education [NCAE], 2017; Moyer et al., 2017; Ramsey & Edwards, 2012). These models allow students to choose an employment opportunity through an entrepreneurial project or an employment placement/internship where the students experience first-hand what employable skills are necessary for success in the workforce (NCAE, 2017).

## Methods

The researcher utilized a descriptive correlational research design. The research instrument consisted of two sections, section one measuring the perceptions of Alabama's and Georgia's CTE administrators on the integration of employability skills education and section two collecting demographic data. Perceptions of the integration of employability skills utilized a five-point Likert-type scale ranging from 1 = "Not Important at All" to 5 = "Extremely Important". Employability skills included applied academic skills, critical thinking skills, resource management skills, information use skills, communication skills, system thinking skills, technology use skills, interpersonal skills, and personal qualities.

A pilot study was conducted with Mississippi CTE administrators to determine face validity and reliability of the survey instrument. The instrument was deemed suitable for the purpose of the study. Reliability coefficients (Cronbach's alphas) for scales measuring the integration of employability skills ranged from .845 to .950, which indicate that the scales are extremely reliable (Gliem & Gliem, 2003).

A list of CTE administrators was compiled using resources from the Alabama State Department of Education, Georgia State Department of Education, school system websites, the Association for Career Technical Administrators (ACTA) mailing list, and, if necessary, a phone call to the local district to identify who managed CTE for that respective district. The list included the name of the administrator, the school system where employed, and their email address. This list contained 137 administrators from Alabama and 178 administrators from Georgia ( $N = 315$ ).

A census was used to collect data which alleviated any sampling bias. According to Gay and Diehl (1992), a response rate of 10% is necessary for quality descriptive research. In this study, a response rate of 41% ( $n = 129$ ) overall was achieved.

To address non-response bias, a third email was sent following the two initial e-mails to collect data to non-responders with a link to a different survey that only collected demographic data. According to Lindner, Murphy, and Briers (2001), a minimum of 20 responses from non-responders is needed to accurately determine non-response bias. This third email returned 22 responses and no statistically significant differences among responders and non-responders were found. In addition, statistical differences among early responders and late responders were assessed as well. Responses that occurred in the first six days were considered early respondents ( $n = 108$ ), and responses that occurred the seventh day and after were considered late responders ( $n = 21$ ). Statistical analysis showed no differences among early and late respondents.

The analysis of all data occurred using SPSS Version 27. To analyze research objectives one and two, frequencies, percentages, means, and standard deviations were utilized.

## Results/Findings

Demographic information from this study is presented in Table 1. Female CTE administrators comprised the largest gender group with 57.4% ( $f = 74$ ) while 42.6% ( $f = 55$ ) of CTE administrators were male. A total of 82.9% of CTE administrators were white ( $f = 107$ ), 16.3% were African American ( $f = 21$ ), and 0.8% were American Indian/Alaska Native ( $f = 1$ ). Approximately 1.6% ( $f = 2$ ) of CTE administrator's highest degree earned was a bachelor's

Table 1

*Personal Demographics of CTE Administrators in Alabama and Georgia (n = 129)*

Characteristic	Levels	<i>f</i>	%
Gender	Female	74	57.4
	Male	55	42.6
Race	White	107	82.9
	African American	21	16.3
	American Indian or Alaska Native	1	0.8
	Other	0	0.0
Highest Degree Earned	Bachelors	2	1.6
	Masters	25	19.4
	Specialist	63	48.8
	Doctoral	39	30.2
Educational Background in CTE	Agricultural Education	16	12.4
	Business/Marketing Education	37	28.7
	Technical/Trade Education	2	1.6
	Family and Consumer Science	3	2.3
	Engineering	2	1.6
	Other Area of CTE	4	3.1
	No Background in CTE	65	50.3
Years as a Classroom Teacher	0-5 Years	17	13.2
	6-15 Years	75	58.1
	16-25 Years	28	21.7
	26+ Years	9	7.0
School System Type	City School System	38	29.5
	County School System	91	70.5
Years in Education Total	0-5 Years	7	5.4
	6-15 Years	49	38.0
	16-25 Years	39	30.2
	26+ Years	34	26.4
Agricultural Education	Offered	102	79.1
	Not Offered	27	20.9
Administrator Over a Charter School	Yes	18	14.0
	No	111	86.0

degree, 19.4% had a master's degree ( $f = 25$ ), 48.8% had a specialist degree ( $f = 63$ ), and 30.2% ( $f = 39$ ) had a doctoral degree. A total of 50.4% ( $f = 65$ ) of CTE administrators had no CTE background. Of those that did report having a background in CTE, 28.7% ( $f = 37$ ) had a background in business/marketing education, 12.4% ( $f = 16$ ) had a background in agricultural education, 2.3% ( $f = 3$ ) had a background in family and consumer science, 1.6% ( $f = 2$ ) had a background in trade/technical education, 1.6% ( $f = 2$ ) had a background in engineering education, and 3.1% ( $f = 4$ ) had a background in others area of CTE.

The average number years of experience as a classroom teacher was 13.05 years ( $SD = 7.07$ ). Total years of experience in education had a mean of 23.25 years ( $SD = 6.69$ ). The administrators reporting claimed that 79.1% ( $f = 102$ ) of their district's offered agricultural education and 20.9% ( $f = 27$ ) did not.

Based on the Likert-type scale used in the study (Table 2), CTE administrators rated Critical Thinking Skills, which includes critical and creative thinking and problem solving, the highest ( $M = 4.71$ ,  $SD = .42$ ) with Personal Qualities, which includes integrity, professionalism, and professional growth, ( $M = 4.61$ ,  $SD = .43$ ) a close second. The third highest set of employability skills rated by CTE administrators was communication skills ( $M = 4.57$ ,  $SD = .47$ ), which included verbal, listening, and written communication skills. The lowest rated employability skill area rated by CTE administrators was System Thinking Skills (i.e., monitoring and improving systems) ( $M = 4.17$ ,  $SD = .68$ ).

### Conclusions

CTE administrators were white females with a specialist or doctoral degree and no educational background in CTE. In addition, CTE administrators were employed in a county school system with less than 15,000 students that offered agricultural education. Furthermore, CTE administrators had 13.05 years of teaching experience and 23.25 years of total experience in education. On average, CTE encompassed most of their duties, and they were not an administrator in a charter school.

CTE administrators valued all assessed employability skill areas as "Very Important" or "Extremely Important". Critical Thinking Skills, Personal Qualities, Communication Skills, and Interpersonal Skills were valued as "Extremely Important" while Applied Academic Skills, Information Skills, Technology Skills, and Systems Thinking Skills were as "Very Important". CTE administrators rating all employability skill areas as "Very Important" or "Extremely Important" illustrates the importance of agricultural education and CTE prioritizing this development in students. If agricultural education is going to meet its longstanding goal of preparing students for the workforce and close the skills gap between secondary education students and industry needs, it is imperative that student possess these employable skills (Casner- Lotto, et al., 2006; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008).

Table 2

*Means and Standard Deviations for Individual and Construct Scores for Employability Skills (n = 102)*

Skill Area	M	SD
<b>Applied Academic Skills</b>	<b>4.48</b>	<b>.54</b>
Scientific Principles and Procedures	4.52	.56
Reading Skills	4.51	.64
Mathematical Strategies and Procedures	4.49	.61
Writing Skills	4.41	.65
<b>Critical Thinking Skills</b>	<b>4.71</b>	<b>.42</b>
Problem Solving	4.79	.41
Critical Thinking	4.75	.43
Reasoning	4.73	.47
Making Sound Decisions	4.71	.48
Planning and Organizing	4.70	.48
Creative Thinking	4.57	.59
<b>Resource Management Skills</b>	<b>4.40</b>	<b>.58</b>
Managing Time	4.55	.56
Managing Materials	4.52	.64
Managing Money	4.38	.70
Managing Personnel	4.17	.79
<b>Information Use Skills</b>	<b>4.48</b>	<b>.54</b>
Communicating Information	4.61	.51
Using Information	4.52	.56
Analyzing Information	4.47	.64
Locating Information	4.42	.65
Organizing Information	4.37	.67
<b>Communication Skills</b>	<b>4.57</b>	<b>.47</b>
Listening Actively	4.64	.52
Communicating Verbally	4.61	.49
Observing Carefully	4.58	.54
Comprehending Written Material	4.54	.56
Conveying Information in Writing	4.48	.59
<b>Systems Thinking Skills</b>	<b>4.17</b>	<b>.68</b>
Understanding and Using Systems	4.24	.69
Monitoring Systems	4.15	.72
Improving Systems	4.14	.73
<b>Technology Skills</b>	<b>4.44</b>	<b>.57</b>
Understanding and Using Technology	4.44	.57

Table 2 (Continued)

<b>Personal Qualities</b>	<b>4.61</b>	<b>.43</b>
Demonstrating Integrity	4.74	.44
Responsibility and Self-Discipline	4.70	.48
Demonstrating Professionalism	4.69	.47
Demonstrating a Willingness to Learn	4.64	.56
Taking Initiative	4.62	.55
Positive Attitude and a Sense of Self-Worth	4.61	.58
Adapting and Showing Flexibility	4.57	.52
Working Independently	4.49	.56
Taking Responsibility for Professional Growth	4.48	.63
<b>Interpersonal Skills</b>	<b>4.52</b>	<b>.48</b>
Teamwork and Working with Others	4.71	.48
Respecting Individual Differences	4.53	.69
Responding to Customer Needs	4.48	.64
Negotiating Resolve Conflicts	4.45	.62
Exercising Needs	4.42	.59
Exercising Leadership	4.42	.59

*Note:* 1 = Not Important at All, 2 = Somewhat Important, 3 = Moderately Important, 4 = Very Important, 5 = Extremely Important

### Recommendations for Future Practice/Research

The finding that the majority of CTE administrators do not have a background in CTE is concerning. In most states, a certificate or degree in Educational Leadership/Administration is required to hold the position of CTE administrator and in most cases, experience in the CTE classroom is not a requirement. A recommendation for school systems would be to require CTE experience to hold the position of CTE administrator especially in instances where the position requires majority CTE duties. Furthermore, based on the perceptions of their CTE administrators, agricultural educators should focus their efforts to instill employable skills such as Critical Thinking Skills, Personal Qualities, Communication Skills, and Interpersonal Skills to ensure their success in the workforce.

This study aimed to assess any differences in perception held by CTE Administrators in Alabama and Georgia on the importance of employability skills and STEM skills integration into agricultural education. In future research inquiries, the following areas should be evaluated: 1.) Research examining the perceptions of CTE administrators in other areas of the U.S. on the importance of employability skills integration 2.) Research on the long-term effects of students participating in a simulated workforce classroom and/or a work-based learning program 3.) Research assessing the professional development needs of agricultural teachers to implement the simulated workforce classroom and work-based learning programs.

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## **Perceptions of an Agricultural Literacy Professional Development Program for Teachers**

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Completed Project  
Teacher Preparation

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# **Perceptions of an Agricultural Literacy Professional Development Program for Teachers**

## **Introduction and Literature Review**

An analysis of agricultural literacy studies uncovered many populations are agriculturally illiterate (Kovar & Ball, 2013). Agricultural literacy can be defined as an “understanding of the food and fiber system [that] includes its history and current economic, social, and environmental significance to all Americans” (National Research Council, 1988, p. 1). Dale et al., (2017) recommends the best way to increase agricultural literacy is to implement agriculture education in classes K-12. However, many students are unaware of the agriculture industry and its impact of everyday life due to lack of exposure. (Kovar & Ball, 2013). If students are not aware of the impact the industry has socially, economically, environmentally, and politically they will not be able to make accurate judgments and decisions regarding agriculture in the future (Kovar & Ball, 2013). Furthermore, the majority of agricultural literacy research has been conducted on elementary students and very little research had been conducted on teachers (Kovar & Ball, 2013). Exploring the agricultural literacy of teachers is important, because how can students become agriculturally literate if their teachers are not agriculturally literate as well?

Anderson et al. (2014) found that K-12 teachers who participated in a weeklong agricultural literacy program had “minimal awareness” of agricultural concepts prior to participation but increased their own agricultural literacy and showed growth throughout the program. These researchers recommended agricultural literacy programs extend training time beyond a single week and the incorporation of more discussions and web-based activities (Anderson et al., 2014). Myers et al. (2005) surveyed new agriculture teachers and found that 11 out of 21 respondents had problems developing curriculum and creating lesson plans. These researchers recommended expanding curricula and providing teachers with professional development opportunities to help them get established and create a support system (Myers et al., 2005). Guided by these findings, the Farm to Classroom program was established to help support K-12 teachers throughout Mississippi. Farm to Classroom’s main goal is to assist teachers in incorporating agricultural literacy into their core subjects through professional development and Mississippi-based agriculture education resources. This work is supported by the Agriculture and Food Research Initiative - Education and Workforce Development program, [2020-68018-31044/1021637], from the U.S. Department of Agriculture, National Institute of Food and Agriculture.

The purpose of this study was to explore the impact of the Farm to Classroom Program on participants' perceived agricultural literacy and confidence in teaching agricultural topics. The following objectives guided this study:

1. Describe change in participants agricultural awareness and agricultural literacy.
2. Describe change in participants confidence in teaching agricultural topics.
3. Determine if participants are using teaching methods and agriculture resources presented during the Farm to Classroom professional development.

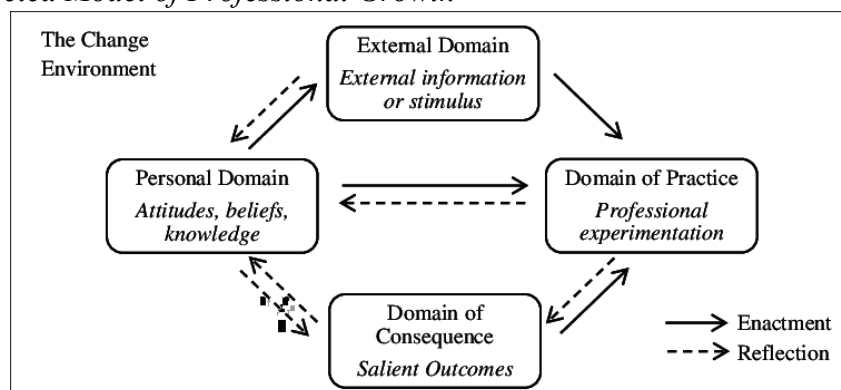
## **Conceptual Framework**

The framework of this study was Clarke and Hollingsworth’s (2002) Interconnected Model of Professional Growth and six perspectives of teacher change (Figure 1). These perspectives

portray change as training, adaptation, personal development, etc. The Interconnected model, figure 1, suggests there are four domains (personal, external, practice, and consequences) in which teachers go through mediating processes of reflection and enactment. This model recognizes that professional growth is a non-linear, continuous process that changes as teachers progress throughout their teaching careers (Clarke & Hollingsworth, 2002).

**Figure 1**

*The Interconnected Model of Professional Growth*



*Note.* Clarke & Hollingsworth's Interconnected Model of Professional Growth (2002).

Farm to Classroom aims to provide teachers with the opportunity to change previous attitudes and beliefs about agricultural literacy and incorporate those concepts in their classrooms. Teachers may be impacted by various internal and external forces (Clarke & Hollingsworth, 2002). These forces can cause conflict with teachers' previous knowledge and beliefs with what they may be learning in the present. Farm to Classroom provides real life applicable content that allows teachers to learn about Mississippi commodities, various literacies, teaching methods and lesson planning. Teachers are then able to implement this content within their classrooms and given time to reflect on this information before continuing evaluations of their agricultural literacy. We assume teachers continue to grow throughout this cycle and continue to incorporate agricultural literacy in their classrooms based on our findings.

## Methods

This mixed-method study targeted K-12 Mississippi teachers who participated in the Farm to Classroom Program in October 2020. IRB approval was obtained prior to data collection and analysis. Participants were recruited to participate in the program through social media posts and emails. To participate, interested individuals completed an application with information regarding their demographics as well as introductory questions regarding previous education, years of teaching, teaching strengths/weaknesses, and the benefits they believe they will gain from the Farm to Classroom Program. The course, facilitated through Canvas, began on October 1, 2020 and ended on October 31, 2020. Over four weeks, participants explored agricultural literacy, Mississippi commodities, types of literacies, how to integrate literacy into the core four subject areas, and pedagogy in the context of agricultural education. Furthermore, participants were given the opportunity to discuss class topics through discussion boards and create their own agriculture-based lesson plans.

In the last module of the Canvas course, participants were asked to complete an evaluation via Qualtrics with open-ended questions pertaining to the most valuable information they learned, the most valuable resources they explored, if they would recommend the program to others. Fourteen of the 18 Farm to Classroom Program completers responded to the evaluation. For analysis, we reviewed the responses and identified common themes individually before meeting as a team to agree on a list of final themes regarding participants' perceptions of the Farm to Classroom Program.

Six months later, completers of the Farm to Classroom Program were contacted and asked to participate in a telephone interview. These interviews were semi-structured with a list of 12 probing questions and follow-up questions for clarification. Questions pertained to the reason for participating in Farm to Classroom Program, teaching methods/strategies they have used to incorporate agricultural literacy, and questions regarding their current perceptions about incorporating agricultural literacy into their classrooms. One member of the research team conducted, recorded, and transcribed the interviews. Again, we reviewed the transcripts and identified common themes individually before meeting as a team to agree on a final list of themes from the interviews.

Eleven months after the Farm to Classroom Program ended, participants were contacted once more to complete a Qualtrics survey about their experiences since completing the program. Participants were asked to rate their level of agreement on a 5-point scale from "definitely not" to "definitely yes" to the following statements: (1) I am more agriculturally aware. (2) I am more agriculturally literate. (3) I am more confident teaching agricultural topics. (4) I am more confident incorporating agricultural topics into my subject area. (5) I can incorporate content literacy and agricultural literacy into a lesson with little difficulty. (6) I can identify and incorporate the Mississippi commodities into my content area. Data were analyzed using descriptive statistics including means and standard deviation.

### **Results/Findings**

All eighteen participants ( $N = 18$ ) lived in Mississippi. Participant's years of teaching ranged from less than a year to 18 years spanning a variety of grade levels and courses taught. Half of the participants ( $n = 9$ ) held a master's degree as their highest degree while the other half ( $n = 9$ ) held bachelor's degrees as their highest degree. Participants stated various strengths and weaknesses as a teacher. Classroom engagement and management were among the most used descriptors for teachers' strengths and weaknesses. However, many participants stated they struggle to integrate technology and other content into their subject area. Various answers were given for the reason to participate in the Farm to Classroom Program. Many participants had personal connection to agriculture in some way or believed their students had a connection to Mississippi commodities, therefore it would be a relevant for their classrooms.

Fourteen of the 18 participants ( $n = 14$ ) completed the program evaluation exploring participants' perceptions towards the Farm to Classroom Program. Regarding available agricultural literacy resources, five of the participants ( $n = 5$ ) preferred using the Mississippi Farm Bureau Agriculture in the Classroom Lessons while nine of the participants ( $n = 9$ ) preferred the National Agriculture in the Classroom Lessons. All fourteen participants ( $n = 14$ )

responded “yes” when asked if they would recommend the Farm to Classroom Program to a colleague. Participants’ responses to the open-ended questions revealed three themes in table 1.

**Table 1**

***Participants’ perceptions about the Farm to Classroom Program (n = 14).***

Theme	Quotes
Connections to agriculture	<p>“Agriculture is woven into almost every aspect of life and when students have an appreciation for it at an early age, they may have endless opportunities open to them in the future.”</p> <p>“The most valuable information I learned is that agriculture affects the WHOLE US economy much more than I ever knew...I appreciate all the workers, teachers, and personnel involved so much more now!! I have so much more respect for my friends, family and even strangers who are involved in making the agricultural world go ‘round.’”</p> <p>“Students need to know where their food, fiber and shelter originates. Students also need to understand what a large part of our state economy agriculture plays.”</p>
Attitudes towards literacy	<p>“The most valuable information I learned was that there is content-area literacy and disciplinary literacy. I had no idea...and it was very interesting to learn about the two.”</p> <p>“I am going to go back through that information to continue to grow in my understanding of literacy strategies.”</p> <p>“I liked the fact that I learned how to incorporate agriculture and literacy together.”</p> <p>“It helped me look more closely at the strategies I am using when incorporating literacy into my units.”</p>
Value of resources	<p>“Teaching is best described as directing and guiding students on the learning process so that they are able to gain new information and skills, even attitudes. Cross curriculum enthusiasm for learning should come with teaching any topic or subject. Agricultural education not only affects those interested in the development of their skills as a farmer or a student of agriculture, but the information that is gained through using education about agriculture impacts us all.”</p> <p>“I learned things that I had never considered, and I was reminded of teaching methods that I have neglected especially during the 2020 pandemic.”</p> <p>“I was introduced to so many new resources during the duration of this class. I would recommend this course to anyone else, not just agriculture-specific specific teachers. I think ag education should be a much larger part of our student's regular curriculum. I feel that teachers may integrate ag education into their lessons more if they only knew where to begin or had guidelines/standards to help guide them. This course does exactly that and would be beneficial to educators of all subjects and grades.”</p>

Six months after the Farm to Classroom Program ended, participants were asked to participate in an interview via telephone. Three of the eighteen participants ( $n = 3$ ) participated in this interview. Three themes were identified from the interviews and displayed in table 2.

**Table 2**

***Themes identified from participant interviews (n = 3).***

Theme	Quote
Hands-on and Experiential Learning	<p>“Farming is a big part of, of the community in general and so most of them can relate to you know anything that is going on with the crop or you know farming machinery or something like that...it is important to, to give them something real world instead of something theoretical.”</p> <p>“The actual hands-on experience the instructor has...like an actual real-world scenario versus textbook scenario...makes it a whole lot more relatable.”</p>
Lesson planning and classroom instruction	<p>“I have used some of the lesson plan resources...They come in handy for the actual planning stage, but we started a school garden as a result of some of this we got a grant after we did the program to actually start a school garden and we have been working with that and using that as a teaching tool.”</p> <p>“We’ve been doing some genetics modeling cattle like it’s a great modeling too like if you’re trying to breed specific types of cattle you need to know what you are breeding for and how you go about doing it so it’s great for teaching genetics.”</p>
Networking opportunities	<p>“The strategy that I’ve learned from one of the teachers... I don’t know the name of the class called but it’s more of the agriculture class and she was able to kind of like give me an overview about the program before I started and she’s also the one who will help me during the summer to be able to teach the summer camp here at the school for the students.”</p> <p>“I’ve actually networked with our ag. Instructor here on campus at the CTC. And I’ve been working with in fact a student at [university] he’s been monitoring he comes in and he has to get so many hours for his degree... And he’s been coming in watching my ap bio class and [student] has been amazing as far as he’s been helping with the garden he’s been helping with other things.”</p>

Eleven months later we sent a follow-up survey to the participants, six responded ( $n = 6$ ). Since completing the Farm to Classroom Program, the participants believed they were more agriculturally aware and literate. Most participants indicated higher confidence in teaching agricultural topics and believed they could incorporate these topics with little difficulty. Additionally, as reported in table 3, participants agreed they could incorporate the Mississippi commodities into their content area.

**Table 3*****Participants agreement with statements regarding agricultural literacy (n = 6).***

Agricultural Literacy Statements	<i>M</i>	<i>SD</i>
I am more agriculturally aware.	4.50	0.76
I am more agriculturally literate.	4.67	0.47
I am more confident teaching agricultural topics.	4.33	0.75
I am more confident incorporating agricultural topics into my subject area.	4.17	1.07
I can incorporate content literacy and agricultural literacy into a lesson with little difficulty.	4.83	0.37
I can identify and incorporate the Mississippi commodities into my content area.	4.83	0.37

*Note.* Responses based on a 5-point rating scale with 5 = definitely yes and 1 = definitely not.

### **Conclusions and Recommendations**

An implication of this study was the unintended virtual format for program delivery due to the concerns of the COVID-19 Pandemic. This implication limited the amount of hands-on experience and networking opportunities we could provide to the participants. However, this virtual format allowed more teachers across the state to participate due to the flexibility of online delivery.

At the beginning of the program, participants indicated being unaware of agriculture in Mississippi and how it impacts our daily lives. This finding was consistent with findings from Kovar's & Ball's (2013) study. However, after the Farm to Classroom Program, participants believed they were more agriculturally literate and aware. This finding is consistent with outcomes reported in the study conducted by Anderson et al., (2014).

Following Clarke's and Hollingsworth's (2002) Interconnected Model of Professional Growth, participants began the program with previous beliefs of agriculture, they were exposed to the program content and networking opportunities, then they were able to experiment with agricultural literacy in their classroom to reach the various goals they may have. Throughout the 4-week program participants had the opportunity to use discussion boards to network with others across Mississippi (Anderson et al., 2014) and were given the opportunity share their attitudes and beliefs after completing the program through the surveys and interviews. Respondents' reported approval of the program structure, increased collaboration with their teaching peers, and incorporation of ag literacy materials into their classrooms. This indicates positive outcomes from the implementation of Clarke's and Hollingsworth's (2002) model and recommendations from Myers et al., (2005) and Anderson et al., (2014).

Moving forward, the program team has created a website with agricultural resources available to teachers, with many of those resources being free. The team has also utilized the platforms Facebook, Instagram, and Twitter to spread awareness of agricultural literacy and Mississippi agriculture. Research should explore the use of social media and websites as a resource by teachers to further increase personal agricultural literacy, as well as, the literacy of their students.

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RUNNING HEAD: COMPLETED PROJECT; AGRICULTURE LEADERSHIP;  
EXPLORING THE CULTURE OF THE FLORIDA AGRICULTURE INDUSTRY.

EXPLORING THE CULTURE OF THE FLORIDA AGRICULTURE INDUSTRY

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Completed Project  
Agriculture Leadership

## **Introduction**

Culture has served as a mechanism to survive since the beginning of time. As different environments present unique problems, groups are formed to adapt to those specific challenges and fulfill basic social and biological needs (Matsumoto, 2007). The uniqueness of the environment in which a group lives in, shapes how the community functions externally and processes internally. Since culture can provide comforts like community, quicker decision making, and a sense of safety, it is a powerful influence on how individuals perceive, process, and behave with the world around them as well as what they teach to others. Culture is not only ethnic groups, nations, or religions, it can present itself in other social groups that have shared challenges and similar mechanisms to manage said challenges (Schein, 2017). Organizational culture, the collectively shared assumptions within occupations, has been found to have an impact within groups and workspaces in terms of job satisfaction, member retention, problem-solving methods, objective reinforcement, and behavior prediction (Huges, 1958; Sappe et al.; Singh, 2016; Macintosh & Doherty, 2010; Tepeci, M, 2005; Visvanathan et al., 2018; Barney, 1986; Detert et al., 2000; Deal & Kennedy, 1983; Gorenak, & Košir, 2012).

Culture is cultivated by unique challenges which require unique solutions to solve, often in response to the unique needs of a group. An industry that has a myriad of unique challenges is the American agriculture industry. The agriculture industry in America endures hardships such as high demands to produce for a growing population of consumers, producing more product on less land, and risks of farming due to weather, politics, and fluctuating markets; however, the presentation of the challenges, tools to combat them, and the magnitude in which they are felt, can vary by region by state, and by commodity. Florida holds distinct attributes that contribute to the challenges and advantageous for Florida agriculturalists. These factors include having the third largest population in America, being one of the few states with significant water access making it a hub for trade, and the sub-tropical climate allowing the production of over 300 commodities as well as host to plethora of diverse pest and diseases (2019 Florida Agriculture overview, 2019; IFAS, 2018). Florida agriculture has adapted to survive and has shaped the way they process, feel, and respond to their problems. Exploring these shared assumptions can lead consumers to better understand the Florida agriculture community providing insight and empathy to those who that make decisions on behalf of the agriculturalist. Identifying the culture and what the significant elements are that form that culture, creates an opportunity to examine how the Florida agriculture industry understands, functions, and reacts to the world around them.

## **Purpose and Research Question**

Research has shown that there is significant influence on shaping people and institutions through culture (Matsumoto, 2007; Schein, 1991). This is a key reason culture should be examined in institutions. This type of exploration could provide insight to others outside of the group as well as serve as a reflective process for internal stakeholders. Because of this perspective, researchers were encouraged to examine the culture of the Florida agriculture industry. A description of the Florida agriculture industry culture was missing in research, which may have resulted in missed opportunities to communicate, market, lead, and grow the industry

more efficiently. Due to the deficiency in information about the culture of Florida agriculture, a holistic and empirical review was necessary. The following research question guided this study:

RQ1) What do the members of the Florida agriculture and natural resource industry perceive to be the shared cultural elements in the Florida Agriculture Industry?

### **Conceptual Model**

A conceptual model was created by combining Schein's (1992) levels of culture and Wren and Swatez's (1995) model of leadership contexts to study the culture of the Florida agriculture industry from the perspectives of members of the Wedgworth Leadership Institute for Agriculture and Natural Resources (WLIANR). WLIANR is a state leadership program for agricultural and natural resource professionals. This model first accounts for the elements of culture that can be found (Schein, 1991) in Florida agriculture. Just as Schein (1991) framed cultural elements based on observability, a congruent approach was used for this framework. The method to discover the artifacts, espoused values, and basic assumptions derived from seeking out shared consensus in the twelve categories culture is found in. The twelve categories are: observed behavioral regularities when people interact, climate, formal rituals and celebrations, espoused values, formal philosophy, group norms, rules of the game, identity and images of self, embedded skills, habits of thinking, mental models, or linguistic paradigms, shared meaning, and root metaphors or integrating symbols (Schein, 2017).

Influences beyond the Florida agriculture industry have a substantial impact in shaping a group culture. This model also recognizes that the levels of culture are shaped by surrounding forces. Using Wren and Swatez's (1995) model provided a deeper understanding of the construction of the element's culture. The model places culture in the category of context so the levels of culture are placed in the center. The model then expands into the contemporary context which for Florida agriculture and includes societal pressures, such as producing safe food and creating massive quantities of agricultural products. The outer layer in the model represents historical contextual forces, including areas of strict policies and changing markets.

### **Research Approach**

A qualitative approach was selected for this study to explore the culture of the Florida agriculture industry. The focus of qualitative approach is to examine elements that naturally occur in ordinary settings so that the researcher can capture the group's genuine lived experience (Miles et al., 2018). Ten participants were selected from past members of the state leadership program for agricultural and natural resource professionals. The organization's purpose is to produce capable leaders able to navigate agriculture production adversities, develop and improve agriculture systems, and effectively advocate for the Florida agriculture industry (WLIANR, n.d.). Participants were selected using quota sampling. The individual interviews lasted between 40-60 minutes and were conducted on the video conferencing platform, Zoom. To analyze the qualitative interviews, the initial recordings were transcribed and were read through several

times to become engrossed in the data and develop a holistic and more in-depth understanding of the transcriptions (Ary et al., 2014). The data underwent two cycles of coding. The first cycle utilized inductive coding to find themes that consistently emerged throughout the ten interviews. Once the first round of themes was identified, a second cycle of coding was conducted. The second cycle of themes were predetermined prior to coding therefore, using a deductive approach. The four themes included 1) historical contextual forces, 2) contemporary contextual forces, 3) artifacts, 4) espoused values. The four themes served as a structure to present findings. Therefore, the data results emerged based on the consensual behaviors, thought processes, beliefs, and values extracted from the interviews. A codebook was used for the second cycle of coding.

## Findings

The findings revealed commonly shared assumptions that were categorized as (1) historical contextual forces, (2) contemporary contextual forces, (3) artifacts, and (4) espoused values. The first category of findings were the historical contextual forces that influence culture, which involved economic, political, and social systems that function as limitations for actions and behaviors (Wren & Swatez, 1995). The historical contextual forces identified by the participants were policy and historical cautionary tales of the tomato and citrus industry. Expressions of strict or unnecessary regulations and disconnected policymakers have heavily influenced Florida agriculturalist's mindset that advocacy is a necessity. Another historical contextual force was that members of the Florida agriculture industry used the tomato and citrus industries' story of being on top in their markets to having a devastating decline as prime examples of the risk and ambiguity of the future involved in the agriculture industry. Stephen highlighted how the devastation of the loss in citrus trees, groves, and citrus growers had reduced the willingness to re-plant:

The citrus industry has become so consolidated where we're almost following what happened with tomatoes. We're going to have to pick and choose what markets we're going to serve, who we're going to under serve, and who we're going to not serve at all. Growers lose confidence in replanting and so they have groves that are going out from disease, but they just can't roll the dice anymore and put something in for fear that the disease is going to wipe it out. So not only have no young people come into replace the retirees, you don't have that next crop coming in behind your current crop.

The contemporary contextual forces described the agriculturalists perception of the surrounding society's perspectives and values. The contemporary contextual force extracted from the data was the general public's misconception and disengagement toward Florida agriculture. The common perception that Florida agriculturalists have is that society believes agriculture operations are easy to manage, require little skills, involve little risk, are factory farms, and do not involve science. However, in light of the COVID-19 pandemic, agriculturalists

were seen as “essential workers” which provided agriculturalist hope that the societal views toward agriculture are changing. A participant stated:

Your country shuts down. They make a list of these are the people that we have decided are the most important people in any industry, not ag specifically but we're going to call these people, essential. It is pretty gratifying to know that as much flack as we get for cutting trees or spraying crops, just all the things that go on or you're polluting water, all the things you get blamed for. That whenever it really comes to the country shutting down, you're considered essential.

The most expansive category in culture was artifacts. Elements found in the artifacts theme ranged from visible products, physical environment layout, interactions with coworkers, language, clothing, myths, to stories communicated to the group through rituals and ceremonies. Artifacts do not necessarily have to be contingent on one another, most often they exist independently. In brief, this section covers the cultural items that are easily seen. The data extracted three major artifacts, which are the identification of sub-culture, the variation in competitiveness and information sharing in sub-cultures, as well as the identification of two agriculture advocacy and leadership groups that facilitate networking between various agriculture commodity groups in Florida agriculture. An example of these sub-cultures and the nature of their information sharing and competitiveness was by a citrus grower:

I do feel like it's a community. I think in certain segments of it. There may be a little more competitive situations where people don't share knowledge and information as much as other commodity groups. Citrus, for example, people share a ton of information because we're going through some difficult times with greening disease. But then you have other niche businesses that are doing really well, people may feel like they're more competitive. So, they're not sharing trade secrets or growing practices or things that would help other growers. But yeah, I think it is a community of people that care about a lot of the same values.

Espoused values are considered those desirable qualities that are verbally expressed by members of a specific community. Study participants shared their espoused values by either directly stating the values or expressing them through storytelling. The espoused values most commonly expressed were integrity, preservation of a legacy/ passion, and tenacity. A participant expressed how that in their experience, agriculturalists will sacrifice selling their operations and gaining financial security in order to pass the business down to the next generation. He also mentioned that there is pressure for those who are a part of a multi-generational operations to continue the legacy:

Farmers will stay poor for all their entire life, just so they can pass that on to the next generation...I think by and large they want to see that culture transcending and once the land is gone. It's gone and never is going to come back and they nobody wants to be the end of that rope...with a sweat equity and tears and kind

of clawed their way along and then the next generation they were able to send them to school to do better for the business.

Another value highlighted was integrity where another participants' stated integrity is important, "because the farmer mentality is still based on a handshake and your word and so to me, that would be the absolute most important characteristics and virtues to have."

### **Implications / Recommendations**

The following implications and recommendations are based on specific findings of this study and due to the design or only intended to address the specific population of this study. This study explored the phenomenon of culture in the Florida agriculture industry. The examination of culture in Florida agriculture was a novel concept and even after the study, it requires further examination for a clearer understanding. However, the findings showcase major cultural themes that are salient to those who have a desire to engage in the Florida agriculture industry or become an agricultural advocate. The findings also serve as a reflective tool to those in Florida agriculture as to the subconscious values that the community holds intrinsically and teaches to incoming members.

Florida agriculturalists named integrity, preservation of a legacy/passion, and tenacity as shared values amongst the Florida agriculture community. Participants expressed the value of having integrity and aligning actions with words when networking with other agriculturalists and operating their business. Valuing integrity is expressed in behaviors such as doing business not by the legality of a contract, but by the trustworthiness of a handshake. Social rejection in the agriculture community would likely take place if an agriculturalist did not display integrity in their business or when doing business with others.

The preservation of a legacy and passion for the industry was also highly valued. Agriculturalists believe that their farming operations are more than just a business, but also a way to showcase their hard work and create a family operation to be passed down for generations to come. Valuing the preservation of a legacy and passion gives agriculturalists the intrinsic motivation to continue working in the agriculture industry even when disheartening challenges occur. However, while valuing preserving the legacy and passion elicits a reason for agriculturalists to preserve while facing obstacles, it is also accompanied by stubbornness to change. Participants believe that fellow Florida agriculturalists who strongly believe in the importance of preservation also have the tendency to not easily adapt to changes in the industry. This research brings awareness to Florida agriculturalists so that they can be more conscious of these tendencies when decision making.

Findings from this study provide transferable information for Florida agriculturalists. As the WLIANR and Florida Farm Bureau were identified as bridges for networking across all agriculture commodity groups; the first implication the researcher would suggest is for these two

organizations to help increase education for society about Florida agriculturalist's lived experience. Education efforts could assist in combating misinformed perception of the agriculture industry in Florida. For instance, utilizing the stories of the Florida citrus and tomato industry to bring recognition and awareness of the risk, skill, hardship, and carefulness involved in the industry to the public. Additionally, the University of Florida can help these two organizations that serve as hubs for networking by promoting the Florida and Florida Farm Bureau through extension. Advertisement can help strengthen and encourage investment and collaboration with these groups and can advocate for agriculture in the state of Florida.

The Florida can utilize this data as a reflection tool for current members to evaluate the mindsets, behaviors, and beliefs that are instilled in this community by holding discussion with members at their annual meeting to further examine and brainstorm solutions for the cultural elements that can be barriers to the growth of the Florida agriculture industry.

This exploratory qualitative study provided initial findings of the Florida agriculture industry; however, as this population has nuanced needs and experiences, additional research recommendations are offered to increase understanding, data, and knowledge within the industry. While WLIANR is a vital piece of the culture, it is not the only community involved in shaping the shared mindset. It is recommended that future research broaden the population that is used to define the culture. It was also discovered that sub-cultures are established in Florida agriculture based upon commodity group organizations. These sub-culture commodity groups should continue to be explored to identify unique needs, challenges, and experiences within the sub-culture groups themselves, and across different sub-culture groups.

It is recommended to continue studying the culture of the agriculture industry on a broader scale. This would examine the similarities and differences of a state's culture to the nation's culture to find where there is overlap in shared mindsets, behaviors, and beliefs. Further research in exploring the country's culture can bring insight into the shared networking behaviors, decision making approaches, and elements that are taught to new members.

It is also recommended that the study should be repeated, performing qualitative interviews, and then developing an instrument based on the interviews to be distributed to the larger population. This shift in research design will result in more depth to understanding the culture.

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## **Female Agriculture Teachers Lived Experiences and Percieved Professional Development Needs when Teaching Students with Special Needs**

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## **Introduction and Literature Review**

In recent years, classrooms have become increasingly diverse. As a result, Hinders (1995) and Stankovska et al. (2015) stressed education should celebrate students' individuality rather than restrict opportunities based on their limitations. In the 2018-2019 school year, 14% of students were classified as individuals with special learning needs, the highest percentage reported to date (NCES, 2020). Despite this growing population of students, Aschenbrenner et al. (2010) reported that successful strategies for teaching students with special needs in agricultural education had not been established. Consequently, more work was needed to determine approaches to accommodate students, especially since agricultural education has been reported to effectively serve students with special needs (Casale-Giannola, 2012). In a study conducted with North Carolina agricultural education instructors, 87% of teachers believed Supervised Agricultural Experiences (SAEs) helped students with special needs set career goals and enhance their social skills (Johnson et al., 2012). As a result, agricultural education appears to provide students with special needs with diverse, hands-on learning experiences which have been reported to increase students' confidence and engagement in agricultural coursework (Harvey, 2001; McLeskey & Weller, 2000).

As such, Pirtle (2012) called for SBAE classrooms to provide appropriate strategies and accommodations for the growing number of students with disabilities. Nevertheless, Giffing et al. (2010) found of the 78 SBAE instructors surveyed, 90% indicated they had a basic understanding of inclusive practices; however, only 76.9% reported they agreed students with special needs should be allowed to enroll in their classes (Giffing et al., 2010). To address this issue, Johnson et al. (2012) described how teacher preparation programs could foster more positive perceptions of inclusive practices by having preservice teachers implement student accommodations during early field experiences. Data collected in 2019 revealed agricultural education pre-service programs reported 74% of license-eligible completers were female (Foster et al., 2020a). The need to identify professional development needs of females when teaching students with sp is further highlighted in Louisiana through a 5% female SBAE instructor loss from the 2018 to 2019 school year (Foster et al., 2020b). Although previous research in agricultural education has described the professional development (PD) needs of SBAE teachers (Aschenbrenner et al., 2010; Dormody et al., 2006; Faulkner & Baggett, 2010; Giffing et al., 2010; Pense et al., 2012; Stair et al., 2010), evidence on this phenomenon has not been updated in nearly a decade. Further, previous studies have overwhelmingly used quantitative measures that have over-relied on the perspectives of male SBAE teachers. Consequently, a need emerged to examine this issue using a qualitative lens from the perspective of women.

## **Purpose and Research Objectives**

The purpose of this qualitative investigation was to explore the experiences and PD needs of female SBAE instructors in Louisiana when teaching students with special needs. This study aligned with the American Association for Agricultural Education's National Research Priority 7: Addressing Complex Problems (Andenero et al., 2016). Two research objectives guided this investigation: (1) describe the experiences of Louisiana SBAE instructors when teaching students with exceptionalities, and (2) describe the PD needs of Louisiana SBAE instructors

when teaching students with exceptionalities.

### Conceptual Framework

This investigation was essential to help identify the areas in which female SBAE teachers perceived they needed additional PD to accommodate students with special needs successfully. To accomplish this, we used the Borich (1980) needs assessment model as our conceptual lens to analyze the study's data. Using this model, we investigated participants' *perceived importance* regarding accomodating students with special needs and their *perceived ability* to facilitate such in practice. When comparing their importance and relevance, this lens helped identify discrepancies concerning women SBAE teachers' PD needs for accomodating students with special needs.

### Methodology

For this study, we used an instrumental case study approach (Stake, 1995). Participants were bounded by *gender, place, and time*, i.e., each participant was a female SBAE instructor in Louisiana during the 2020-2021 school year. We also purposefully sampled participants based on their certification type certification (Creswell & Poth, 2018). To collect data, we conducted semi-structured interviews with participants (Stake, 1995). Data were also triangulated using a quantitative questionnaire in which participants responded to their PD needs on a 5-point Likert-type scale; however, only qualitative data was featured in this report. All participants identified as white females. Efforts to expand participant demographic range was made, but ultimately unsuccessful. Ultimately, participant demographics were representative of SBAE demographics in Louisiana. They were intentionally selected based on their licensure type. A brief overview of each participant has been provided to illuminate their personal and professional characteristics (see Table 1).

**Table 1**

*Overview of Qualitative Participant Personal and Professional Characteristics*

Pseudonym	Age	Previous Special Education PD	Completion of Special Education Course	Gender	Highest Degree Earned	Licensure Certification	Years Teaching
Margret	28	No	Yes	Female	Bachelor	Traditional	7
Susan	31	No	No	Female	Bachelor	Alternative	4
Haley	48	No	No	Female	Master	Alternative	19
Rachel	23	No	Yes	Female	Bachelor	Traditional	3
Emma	35	Yes	Yes	Female	Master	Traditional	12
Hannah	36	Yes	Yes	Female	Bachelor	Alternative	15

### Data Analysis

After data collection, we transcribed interviews verbatim. Then, we used Saldaña's (2021) coding procedures to facilitate an in-depth analysis of the data. Through this process, codes were

generated using participants' words to advance meaning. Additionally, our coding helped to "summarize, distill, [and] condense" data to accurately describe our emergent findings (Saldaña, 2021, p. 5). To accomplish this, we used first-cycle coding approaches to begin our analysis using an "open-ended approach" (Saldaña, 2021, p. 121). In this investigation, first-cycle coding procedures consisted of in-vivo, descriptive, and structural. Then, we engaged in second-cycle coding to reduce the data to categories. Next, we used an axial coding approach by which we scrutinized the first-cycle codes and reduced them to 16 distinct categories (Saldaña, 2021). After axial coding, we engaged in thematic analysis by which we interpreted the categories through Borich's (1980) needs assessment model. This process helped us to emerge the study's two themes and four sub-themes.

### **Building Quality into the Study**

We established rigor and trustworthiness by following Tracy's (2010) eight criteria for upholding qualitative quality. First, we established a worthy topic by investigating a phenomenon with relevance and significance because it focused solely on female SBAE teachers' PD needs, which has not previously been conducted. Additionally, the investigation achieved rich rigor and meaningful coherence by collecting and analyzing data aligned with the study's intended purpose (Tracy, 2010). Meanwhile, we ensured resonance by emphasizing the transferability of the study's findings and describing the methods in full to convey the investigation's rigor to readers (Tracy, 2010). Bracketing, peer-debriefing, and thick descriptions were also used to uphold sincerity and credibility (Tracy, 2010). Lastly, we employed ethical practices by complying with IRB regulations to ensure we protected participants' confidentiality, the use of pseudo-names, and attention to cultural ethics for the target population's state.

## **Findings**

### **Relevance**

When interpreting participants' perceived relevance through Borich's (1980) needs assessment model, two sub-themes emerged: (1) perceptions, and (2) accommodation supports.

#### ***Relevance Sub-Theme 1: Employment and Approaches to Accommodations***

Participants described their positive perceptions regarding the benefits of including students with special needs in SBAE classrooms. For example, Hannah discussed her desire to promote inclusivity, stating: "I never want them [special needs students] to feel different than anyone else... if I have to do those things [implement accommodations or modifications], I do that behind the scenes." Meanwhile, Margret shared how SBAE programs were beneficial for student with special needs: "Our [agricultural education] classrooms naturally lend themselves to be the least restrictive environment." Because of the nature of SBAE classrooms, participants also shared the accommodation approaches they implemented to build inclusivity. As an illustration, Susan discussed a strategy in which she "[went] through and reformatted a lot of notes with more pictures... more visual..." Whereas Emma shared how she completed check-ins with students with special needs when they completed an assignment to determine if they needed additional accommodations or modifications.



Participants also described their willingness to modify their classrooms and laboratory spaces to develop and maintain an environment that was easy to navigate for students, especially those with orthopedic impairments. On this point, Haley shared her experience of teaching a student in a wheelchair and how, as a result of the experience, maintaining an inclusive environment would remain a priority for her in the future. When organizing her classroom, she shared: “I always try to keep in mind that they [students with special needs] may need to get around...that’s always been a consideration.” Further, when providing the classroom accommodations for her student in a wheelchair, she expressed the difficulties she experienced in obtaining a handicapped desk: “I had to fight to get it... since that student left, I’ve refused to take it out.”

### ***Relevance Sub-Theme 2: Perceptions***

The second sub-theme focused on participants’ perceptions of teaching students with special needs. They described how their perceptions and beliefs influenced their decision to include this student population in the FFA organization, the leadership component of agricultural education’s three-circle model. All participants reported they perceived such experiences allowed students with special needs to form personal relationships with their peers. Although participants shared positive perceptions of accommodating students, only three of the six participants had a personal experience including this population in FFA. Case in point, Margret shared how she had a student with autism compete in the FFA Land Judging Contest. Although the student did well in the competition, it was often difficult to navigate portions of the contest as the student became overwhelmed when surrounded by a large group of people. Upon reflection of the experience, she shared: “You [the instructor] just have to kind of need to know what you’re working with, so I think that there’s times that I just didn’t think enough about how to provide those needs.” Emma also shared her experiences advising one student who was in a wheelchair and another student with Down Syndrome who showed livestock. Emma described the experience as being a positive one: “they loved it... they were a part of it.”

### **Relevance and Ability**

In the second theme, participants expressed their perceived relevance and ability through two sub-themes: (a) education, and (b) PD on teaching students with special needs.

### ***Ability Sub-Theme 1: Education***

Three participants in this investigation completed their teacher certification through a traditional licensure program. As a requirement of this certification type, they were required to complete a three-credit hour course in special education. Emma and Margret discussed that although they did take the course, they did not gain a significant amount of knowledge from the experience. For example, Margret shared: “Really, I didn’t receive much [education related to teaching students with special needs]” This was echoed by Emma who explained: “All I can really remember is that when I was doing my teacher preparation, we had to take one class on special populations.” Rachel, however, construed more meaning from her experiences because she was required to tutor students with special needs in her required course. She described how the tutoring experience allowed her to develop a deeper understanding of the differences among

students since she did not have any prior experience teaching students with special needs. Rachel explained: “I never really struggled, like, I didn’t have a learning disability or anything else, so it was eye opening in the sense it made me realize, oh, everyone’s not like me.”

### ***Ability Sub-Theme #2: Professional Development***

The last sub-theme of the investigation described participants’ perceived relevance and ability regarding PD. As participants shared their experiences, they indicated a need to further to improve their ability to accommodate students with special needs. None of the participants had attended previous PD focused on special education in SBAE. However, they did indicate participation in annual training provided through their local school district. As participants shared their experiences regarding their school district’s PD, many described the events as being targeted toward general education teachers in core subjects. For example, Rachel explained: “[the professional development] my local school district puts on... they’re never really designed for ag teachers, it’s more like traditional math and English.” Hannah also shared her frustration with her school district’s PD since it was: “typically a PowerPoint that somebody gets up there and reads, and it’s the same PowerPoint that they’ve been using since that person took the position, they just updated the numbers.” Participants also described their experiences in school district trainings as more of a blanket session to ensure teachers were upholding the legal requirements without providing specific, in-depth information.

Despite dissatisfaction with the PD they had participated in previously, all participants indicated they would attend PD events focused on students with special needs in SBAE. When asked if she would attend training on the inclusion of special education students, Susan said: “definitely, especially with the number [of students with special needs] that I see in this area, definitely yeah, I probably honestly need it.” Participants also discussed how they would be more likely to attend the events if offered through the Louisiana Agriscience Teacher Association (XATA). For example, Emma maintained: “If it [PD focused on students with special needs] was at the ag teacher conference, [XATA], I would go to one.” Susan also shared: “I find I get more out of the conversations [with other SBAE teachers] during professional development from XATA.” Two participants also expressed a desire to receive training through XATA summer PD because they would not have to schedule additional time off. Haley explained: “I just feel if it’s during the year, it’s so much more difficult because it feels like you’re taking away from the time you would have had with a child [in the classroom].” Emma agreed with this sentiment: “I don’t know that they [school officials] would let me take time off of school to go.”

When discussing perceived PD needs, the women described the need for specific training based on disability types, along with skills they could apply directly to their classroom and program. In particular, three participants identified a desire for training on students with autism. Participants shared many students who had autism were not immediately identifiable until they were exposed to a particular stimuli. As Haley reflected: “I have one young man I didn’t even realize he had autistic behavior till he blurted something inappropriate to another student.” Meanwhile, Margaret shared a sense of unease because of her lack of knowledge about autism, specifically regarding how to prepare lessons and accommodate students who have autism in FFA and SAE activities. Participants also identified challenges to teach students with emotional or behavioral disorders, visual impairments including blindness, and hearing impairments such as deafness. For instance,

Susan reflected on her fears concerning teaching a student who had an emotional disorder that restricted his ability to process emotions, and ultimately led to physical altercations. Hannah also related to not feeling prepared enough to know what “triggers” may be associated with each student. Similarly, Emma argued: “a behavior disorder can be a little bit unnerving.” In contrast, Rachael revealed she did not feel the need for PD focused on more common disorders such as ADHD, but instead, had difficulties with: “students who are in a wheelchair or have bad vision... like a vision impairment or hearing impairment.”

### **Conclusions, Discussion, and Recommendations**

The purpose of this investigation was to describe the prior experiences of female SBAE instructors in Louisiana when teaching students with special needs and articulate their PD needs on this phenomenon. As a result, we concluded female SBAE instructors in Louisiana experienced a discrepancy between ability and relevance when teaching students with special needs – a finding that has not been explored in the literature. This investigation also found the women believed most of their PD experiences on special education were inadequate because they were fast-paced, repetitive, and not specific to SBAE.

Based on these results, PD should be offered based on specific disabilities and inclusion strategies that are most essential for female teachers. Specifically, participants indicated a greater need to accommodate students with physical disabilities in a laboratory setting. Because a gap may exist in content knowledge about specific disability categories and strategies when teaching students with special needs, is it possible further marginalization of students with special needs may be occurring in classrooms? If women SBAE teachers perceive students to be of low ability or are unaware of how to effectively teach certain students, they may unintentionally reduce their experiences and opportunities (Aschenbrener et al., 2010; Faulkner & Baggett, 2010; Jobling & Moni, 2004; Johnson et al., 2012; Kessell, 2009; Ruhland & Bremer, 2002; Stair et al., 2019).

Involvement in FFA has been shown positive to have impacts on students’ self-identity, employability after graduation, and soft skill development (Bowling & Ball, 2020; Hansen et al., 2003; Lundry et al., 2015; NAAE, 2021). However, how is SBAE serving all, if students with special needs have not been routinely encouraged to participate in FFA events? For example, one participant in this investigation shared her experience traveling with a student to the National FFA Convention. Upon arrival, the student’s accommodations were not met for an award ceremony and they were unable to participate. To serve all students, SBAE must increase the self-efficacy of female instructors to involve this population in the total program while also ensuring that, once included, they can participate at the same level as their peers.

We also recommended that the results of this investigation be shared with state SBAE staff, university faculty, and Louisiana Agriculture Teachers Associations. These groups should then work collaboratively to use the findings of this investigation to provide PD events for women SBAE instructors on special education. PD events should not be general special education trainings. Instead, they should focus on specific disability types and/or specific skill competencies. In addition, PD events should also present contemporary approaches to accommodating students with special needs that are directly applicable to women SBAE instructors in their classrooms as well as during SAE and FFA advisement (Johnson et al., 2012).

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## **Secondary Agricultural Education Instructors Perceived Importance and Ability when Accommodating Students with Special Needs**

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## Introduction and Literature Review

Historically, agricultural education has served an essential role in developing the employability skills of students with special needs (Lundry et al., 2015; Wonacott, 2001). Specifically, the hands-on application of content found in the agricultural education curriculum has been shown to provide positive outcomes for students with a variety of learning needs (Harvey, 2001; McLeskey & Weller, 2000). As a result, in 2011, almost one-fifth of school-based agricultural education (SBAE) students in the United States were identified as having a disability (Easterly & Myers, 2011). The hands-on application of agricultural skills has allowed students with special needs to cultivate occupational skills and a positive self-identity that can be applied to life post-graduation and ultimately increase employment opportunities (Bowling & Ball, 2020; Hansen et al., 2003; Harvey, 2001). This comes at a time when public school accountability has demanded school systems more accurately meet students' needs (Dormody et al., 2006). To meet the diverse needs of agricultural education students, therefore, SBAE instructors must be given adequate training through formalized education and professional development (PD) training (Stair, 2009).

Landmark legislation was passed in 1975 through the Education for All Handicapped Children Act (EHA) as one of the first critical pieces of policy designed to protect the rights of students with special needs (USDOE, 2010). Students with special needs have primarily been served through the Individuals with Disabilities in Education Act (IDEA) and received services under one of the thirteen IDEA categories of disabilities: including (a) autism spectrum disorder, (b) blindness or a visual impairment, (c) deaf-blindness, (d) developmental delay, (e) emotional disturbance, (f) hearing impairments, including deafness, (g) intellectual disability, (h) orthopedic impairment, (i) other health impairments, (j) specific learning disabilities, (k) speech or language disabilities, (l) traumatic brain injury, and (m) developmental delay (IDEA, 2004). Although students in this population have increased in prevalence over the past 50 years (NCES, 2020), research has indicated teachers have been under prepared to work with these individuals (Hoerst & Whittington, 2009; Stair et al., 2010). In agricultural education, research has shown teachers often disagree their teacher preparation programs prepared them to work with students with unique learning needs adequately (Hoerst & Whittington, 2009; Stair et al., 2010). Further, Louisiana agricultural education teachers in early, mid, and late career stages reported they desired more PD opportunities to better teach learners with special needs (Roberts et al., 2020).

PD programs have been identified as a critical support system for teachers in the classroom as they seek to address deficiencies and emergent changes in education (Birman et al., 2000; Easterly & Myers, 2018; Ruhland & Bremer, 2002). Alquraini and Gut (2012) emphasized education should be an ongoing process for educators and PD was essential to help teachers succeed. Further, correlations have been identified through SBAE instructors engagement in PD, and career satisfaction (Easterly & Myers, 2019). However, not all PD programs have been created equal. The most effective opportunities have been designed to address teachers' specific needs, which may differ based on a variety of contextual variables. Recent work conducted by Stair et al. (2019) analyzed the PD needs of school-based agricultural education (SBAE) teachers in Louisiana based on traditional and alternative certification. An analysis between these two groups identified different PD needs by licensure type and further acknowledged PD needs were not static and changed over time. Consequently, more knowledge was warranted to understand

the challenges of SBAE teachers as they accommodate students with special needs to help ensure they can be retained in the profession.

### **Purpose and Research Objectives**

The purpose of this investigation was to identify Louisiana SBAE teachers' (1) previous education regarding teaching students with special needs and (2) desired PD opportunities when accommodating students with special needs. This research aligned with the American Association for Agricultural Education's National Research Priority 7: Addressing Complex Problems (Andenero et al., 2016). Three research objectives guided this investigation:

1. Identify the education received by Louisiana SBAE teachers regarding teaching students with special needs.
2. Identify the discrepancy between relevance and ability of Louisiana SBAE teachers when accommodating students with special needs.
3. Identify the discrepancy between relevance and ability of Louisiana SBAE teacher regarding inclusion strategies for students with special needs.

### **Conceptual Framework**

Teacher perceptions often guide the success of inclusive practices. As such, the conceptual framework grounding this investigation was the Borich needs assessment model, created by Borich (1980). The model outlines critical components that define the format and quality of data collection regarding PD needs (Borich, 1980). Therefore, it is often used to describe teachers' training needs by identifying discrepancies between the perceived relevance of a topic compared to an individual's professional knowledge or ability in that area. In this context, training needs are defined as "a discrepancy between an educational goal and trainee performance in relation to this goal" (Borich, 1980, p. 39). Typically, questionnaires that utilize the Borich model have been formatted using a two-step response in which participants rank their perceived relevance followed by their perceived level of competence. The difference between an individual's relevance and competence has then been calculated to determine a Mean Weight Discrepancy Score (MWDS) for each item in the construct.

### **Methodology**

#### **Instrument Design**

Using the Borich (1980) model, an instrument was created that consisted of two primary constructs and additional demographic information. The two constructs presented participants with 37 double-matrix competencies containing disability types and inclusion strategies as well as strategies related to the successful inclusion of students with special needs. Participants were asked to respond to each competency twice on a four-point scale, first by rating their self-perceived relevance and then by rating their self-perceived ability in the competency.

The first construct included 11 competencies and asked participants to indicate their perceived relevance and perceived degree of competence when accommodating disabilities recognized by IDEA, which included: (a) attention deficit hyperactivity disorder (ADHD), (b) autism spectrum disorder, (c) blindness or a visual impairment, (d) deaf or hearing impairment, (e) emotional or

behavioral disorder, (f) intellectual disability, (g) orthopedic impairment, (h) other health impairments (not including ADHD), (i) specific learning disabilities, speech or language disabilities, and (j) traumatic brain injury. Due to the prevalence of ADHD in the general student population, it was removed from being included with Other Health Impairments and provided its own category in the instrument. The second construct included 27 competencies regarding inclusion strategies for students with special needs in SBAE, which were sourced from instruments created by Kessell (2005) and Stair (2009).

Content validity was established through an expert panel review of three agricultural education faculty members, who determined the instrument to be valid. Prior to instrument distribution, a pilot study was conducted with SBAE instructors in a neighboring state, which was selected due to the similarity of demographics as compared to SBAE instructors in Louisiana. The pilot study data concluded with 25 responses. Reliability was established by Cronbach's alpha through analysis of each item on the two constructs that consisted of three data groups. The reliability scores included: Construct One – Grouping One, importance ( $\alpha = 0.922$ ) and competence ( $\alpha = 0.896$ ); Construct Two – Grouping Two, importance ( $\alpha = 0.944$ ) and competence ( $\alpha = 0.908$ ); and Grouping Three, importance ( $\alpha = 0.973$ ) and competence ( $\alpha = 0.930$ ). Therefore, the reliability scores indicated strong reliability.

## **Population and Sample**

The target population of this study was SBAE instructors in Louisiana ( $N = 267$ ). We used Dillman et al. (2014) tailored design approach to facilitate the collection of data through email. Follow-up emails with a link to the questionnaire were sent by Louisiana FFA state staff using the Louisiana FFA listserv. We used this approach to minimize coverage error in the study (Dillman et al., 2014). Following email communication, participants were contacted through phone calls asking them to complete the survey. Of those that chose to participate ( $n = 102$ ), 64 completed the instrument in its entirety for a response rate of 24% however. Further, of the initial 102 that chose to participate ( $n = 102$ ), 22 did not complete the first grouping, an additional seven did not complete the second grouping, and eight did not complete the last grouping. Overall, completed responses were collected for a final sample size of 64, a response rate of 24%. Through an exploration of empirical research of response rate, the studies response rate was perceived to be influenced by multiple factors such as survey fatigue combined with external stress factors the occurred during the fall 2020 semester, the period of data collection, which included the COVID-19 pandemic as well as the occurrence of an unprecedented hurricane season which resulted in the landfall of five hurricanes in Louisiana (Baruch & Holtom, 2008; Plaisance & Santana, 2020). Through data analysis methods of Mean Weight Discrepancy Scores (MWDS), it was deemed applicable to report each construct based on the sample size that completed each section of the instrument, which resulted in larger response rates for individual constructs.

Respondents consisted of 31 (48.40%) males and 33 (51.60%) females. When asked about their highest degree earned, 35 (54.70%) of participants indicated they had achieved a bachelor's degree, 23 (35.90%) indicated a master's degree, four (6.30%) possessed a specialist or sixth-year degree, and two (3.10%) participants had earned a doctoral degree. Regarding the teacher education credential pathway, 39 (60.90%) participants received their teaching license from a

traditional Bachelor of Science program, eight (12.50%) participants received their alternative licensure from a Master of Science program, and 17 (26.60%) received their licensure from alternative methods. Participants who received their certification through alternative sources ( $n = 25$ ) indicated a variety of programs were used to achieve licensure including iTeachLouisiana ( $n = 3$ ), Louisiana State University's alternative certification program ( $n = 1$ ), Louisiana State University's alternative certification program ( $n = 1$ ), and Louisiana Tech University's alternative certification program ( $n = 1$ ).

## Findings

Research objective one sought to describe the education Louisiana SBAE instructors received regarding teaching students with special needs. We defined education as the information gained through a formal college course focused on teaching students with special needs. In all, 44 (68.80%) participants indicated they had, while 20 (31.30%) participants indicated they had not had a special education course.

Of the 44 (68.80%) participants who had completed a college course featured methods of teaching students with special needs, 40 (90.90%) reported the course to be a requirement for their degree, and four (9.10%) reported they took the course as an elective. Participants were also asked to report the number of credit hours completed in regard to teaching students with special needs. Of the 38 participants who reported the number of course hours completed, 19 (50%) participants reported taking three credit hours of special education coursework. An outlier was present from one participant who completed 36-course hours as a component of completing a special education certification.

Research objective two employed the Borich needs assessment model to identify the discrepancy between perceived relevance and perceived ability related to working with specific disability categories. In analyzing the discrepancy between relevance and ability, MWDS were determined for each disability type. The three disability types with the highest MWDS discrepancies reported were blindness or visual impairment (MWDS = 4.59), deaf or hearing impairment (MWDS = 4.17), and traumatic brain injury (MWDS = 3.91). The lowest reported discrepancy was attributed to ADHD (MWDS = .78).

The third research objective sought to describe the discrepancy between participants' perceived degree of relevance and the perceived importance of 26 inclusion strategies. Strategies identified as the highest need for PD based on discrepancies were understanding legal regulations of teaching students who possess special needs, not only in the classroom but also when including these students in FFA and SAE opportunities (MWDS = 3.54), receiving adequate education and training for teaching students with special needs through PD (MWDS = 3.51), and providing accommodations for students when competing in FFA activities (MWDS = 3.31). The lowest discrepancies were found in the inclusion strategies of successfully evaluating the academic performance of students who have special needs (MWDS = 1.29) and utilizing methods to foster a sense of acceptance and inclusion for a student with a disability while in the classroom (MWDS = 1.19).

## **Conclusions, Discussions, Recommendations**

The purpose of this investigation was to describe Louisiana SBAE teachers' (a) previous education regarding teaching students with special needs and (b) desired PD opportunities regarding accommodating those students in the classroom. As a result of this investigation, we concluded the majority of teachers surveyed completed special education coursework. However, discrepancies existed among participants regarding their confidence to teach students with special needs, which indicated a need for PD for teachers in Louisiana. This supported the findings of similar investigations in agricultural education (Aschenbrener et al., 2010; Faulkner & Baggett, 2010; Kessell, 2009; Ruhland & Bremer, 2002; Stair et al., 2019).

Research objective one sought to describe the education received by Louisiana SBAE teachers in regard to teaching students with special needs. The majority of participants indicated they had completed a course designed to prepare them to teach students with special needs. Participants who completed such coursework reported they had only completed one special education course during their teacher preparation program. This conclusion was consistent with prior research, which has indicated preservice coursework in special education has often been required; however, such may not have been extensive enough to help teachers feel adequately prepared (Faulkner & Baggett, 2010; Kessell, 2009; Stair et al., 2019). Therefore, we concluded even if participants received preservice education on teaching exceptional students, the limited extent of the course might not have provided adequate time for the development of teachers' positive perceptions and strategies to accommodate students with special needs.

Research objective two described the discrepancies between participants' perceived relevance and ability when teaching students with disabilities based on 11 disability types. Of the 11 disability types, participants indicated the most significant discrepancies were for blindness or visual impairment (MWDS = 4.59), deaf or hearing impairment (MWDS = 4.17), and traumatic brain injury (MWDS = 3.91). This discrepancy further reiterated the overarching PD needs of SBAE instructors in Louisiana when teaching students with special needs—a finding that aligned with prior research (Stair et al., 2016). Kessell (2005) found 19.8% of preservice teachers identified a lack of confidence when teaching students who were deaf or had a hearing impairment. Because accommodating these disability types requires advanced training, participants suggested such should be addressed through PD moving forward (RMTC-D/HH, 2020). In Louisiana, blindness and low-vision have historically represented less than 5% of the total student population (Louisiana Department of Education, 2019). However, even with its low prevalence, findings from this investigation indicated accommodating students with more severe disabilities had been areas teachers felt unprepared to address in their classrooms. In many instances, PD on special education has been too broad and only addressed an overview of special education. Based on this study's results, providing PD geared to each disability type might be more effective in preparing teachers to work with diverse learners.

Research objective three described the discrepancy between participants' perceived relevance and ability when implementing inclusive strategies in their classrooms and programs. Of the included strategies, participants identified the greatest discrepancy in the following areas: understanding legal regulations of teaching students who possess special needs, not only in the classroom but also when including these students in FFA and SAE opportunities (MWDS =

3.54), receiving adequate education and training for teaching students with special needs through PD opportunities (MWDS = 3.51), and providing accommodations for students when competing in FFA activities (MWDS = 3.31). Conclusions of the investigation aligned with prior work by Hoerst and Whittington (2009), which found 80% of Ohio SBAE instructors indicated a need for PD when teaching students with special needs, especially concerning student involvement in the National FFA Organization. FFA involvement has been considered a critical component of a student's experience in a total agricultural education program (Croom, 2001; NAAE, 2021). If SBAE teachers do not feel competent when accommodating students in FFA activities, students with special needs will be less likely to be included in such events. Therefore, more knowledge is needed on special education that directly influences teachers' perceptions and students' experiences in SBAE (Johnson et al., 2012; McCray & McHatton, 2011). Although this investigation builds on previous work in the state regarding the lack of education and training of SBAE instructors (Stair et al., 2016), it also expanded knowledge regarding the disability types and inclusive strategies teachers desired to gain more insight on through PD.

Each year, the number of students with special needs has increased in U.S. public schools, resulting in a record high of 14% of students with a documented disability during the 2018–2019 school year. With the rise of this population, Pirtle (2012) identified an immediate need to ensure SBAE classrooms promote the inclusion of all students. To address this need, teacher preparation programs should expand opportunities for preservice teachers to gain confidence and experience accommodating students with a disability (Stair, 2009). We also recommended teacher preparation courses tailor instruction based on the disability types of students, accommodation methods, and inclusive strategies. However, pre-service education methods are not enough to help ensure teachers are fully prepared to work with such a wide variety of students. Therefore, we recommend diverse PD be offered in Louisiana to better support SBAE teachers as they accommodate the various disability types of students identified in this investigation.

We also recommended this study be replicated to identify the education and PD needs of SBAE instructors when accommodating students with special needs at the regional and national levels. Further, the investigation of the PD needs of SBAE teachers should be conducted regularly to determine the changing needs of the profession when teaching students with exceptionalities. Licensure programs, both traditional and alternative, should also ensure preservice teachers have been provided with educational experiences that incorporate meaningful content and classroom observations that feature teaching students with special needs. Additionally, curricular experiences in teacher preparation programs should not only prepare teachers to teach students with a disability in the classroom successfully but also in laboratories, Supervised Agricultural Experiences (SAEs), and the FFA (Hoerst & Whittington, 2009; Kessell, 2009). In addition, coursework should provide instruction on the federally recognized disability types, and the legalities teachers may face when accommodating students. Finally, we also recommend preservice teachers complete classroom observations to gain more experience observing successful strategies to accommodate students with special needs.

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# **The Effects of Single-Sex Classrooms Compared to Coeducational Classrooms On Secondary Student Career Interest**

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## **Abstract**

*Same-sex classrooms has been a topic of interest in the educational community since the No Child Left Behind Act of 2001. Proponents of same-sex classrooms argue that it reduces social anxiety, physical aggression, and can close the achievement gap between boys and girls. This quasi-experimental study compared students in same-sex classrooms and coeducational classrooms of ten various Principles of Agriculture courses in Kentucky, and the influence these teaching models had on students' career interests. Key findings from this experimental study included: (a) boys in same-sex classrooms ranked their interest in the agriculture, food, and natural resources (AFNR) career pathway the highest; (b) boys in both groups ranked agricultural education as one of their top three pathways of interest; and (c) boys and girls in both classroom structures ranked science, technology, engineering, and mathematics careers in the bottom three pathways of interest. Recommendations from this study include: (a) exposing boys to careers in agricultural education early in high school; (b) provide trainings for teachers to address gendered stereotypes among perceived "masculine" and "feminine" careers; and (c) professional development for teachers on same-sex classrooms; and additional longitudinal and qualitative research*

## **Introduction**

Experts continue to weigh in on whether same-sex classrooms have a place in the United States' public school system. Recent amendments to educational policy have resurfaced an unsettled debate between educators, researchers, and policymakers on the effectiveness of these learning environments (Klein et al., 2014). In response, researchers have attempted to resolve this debate with support from empirical evidence, yet methodological limitations, primarily the inability to randomize samples in public schools, have prevented a clear resolution.

Coincidentally, educational administrators are increasingly implementing same-sex classrooms in the hope to increase students' academic performance (Klein et al., 2014). Advocates for same-sex classrooms argue that such learning environments help reduce the national achievement gap between boys and girls (Gurian et al., 2009), empower youth by reducing stereotypes (Bowe et al., 2015), reduce social anxieties (Hart, 2016), and decrease physical aggression in adolescents (Dijkstra & Berger, 2017). These beliefs are primarily based through the lens of the biological differences perspective that suggests males and females have biological differences that need specialized attention. In educational settings, same-sex classrooms allow for instructors to tend to these biological differences by amending their pedagogy (Sax, 2017).

This study attempted to address an ongoing debate on the effectiveness of single-sex classrooms in public schools. Addressing these discrepancies in the literature is important because there is a growing need for policymakers, administrators, teacher educators, scholars, and teachers to find solutions to improve students' academic performance.

### **Theoretical Framework & Literature Review**

Gender Schema refers to the mental structures that organize incoming information according to gender categories (Bem, 1981). Children determine the in and out groups in which they learn social dichotomies according to their biological sex. Once an identity is acquired, they are able to understand information as it applies to their own group (Priess & Hyde, 2010). Priess & Hyde (2010) posit that people do organize and remember information according to their sex and are more likely to preference activities, classes, hobbies, and extra-curricular associated with their own sexual identity.

Few would argue that gender is influenced by social and environmental factors. The formations of gender may begin early in a child's development. As early as age two, children can dictate differences in gender and by age three children begin to believe their sex cannot change (Woolfolk & Usher, 2018). By age four, children prefer to spend more time, approximately three times as much, with same-sex friends; at age six, preference to same-sex friendships grow to 11:1 (Halim et al., 2013). Scholars suggest that as children age, they are exposed to more sociocultural factors and influences. According to Woolfolk and Usher (2018), children begin to understand what it means to be male or female through a complex network of knowledge, or gender schemas.

Teachers also contribute to learning gender. Gansen (2017) used ethnographic data collected over ten months of observations in preschool classrooms to argue that teachers construct (and sometimes disrupt) gendered norms. Gansen argued that teachers, even as early as preschool, contribute to heteronormativity or the concept that heterosexuality is normal, appropriate, and privileged. Such beliefs induce gender bias in the classroom. Gender bias that favors hegemony are often subtle, such as wall art, reading selections, and the overuse of gendered pronouns (Brown & Stone, 2016). All bias is not advantageous for boys. Some researchers proclaim that current educational pedagogy, methodology, and learning environments have contributed to the national underachievement of boys. Some scholars suggest the academic performance of boys to be, "one of the most pressing educational equality challenges of current times" (Hartley & Sutton, 2013, p. 1716). Recently scholars held discussions and shared anecdotal beliefs regarding boys taking less student leadership roles within agriculture youth organizations (Meyers, 2018). Coincidentally, colleges of agriculture are noticing a depletion of males seeking to be prepared for post-secondary careers in agriculture (Conger & Long, 2010).

Newsom-Stewart and Sutphin (1994) found that girls and boys held differing perception about agricultural education and called for further investigations that "examine cultural and gender differences" in SBAE (p. 55). Their recommendation spurred studies that investigated the effects of gender on student achievement (Johnson et al., 1998), students' rationale for course selection (Sutphin & Newsom-Stewart, 1995), and the emergence of girls in leadership roles (Ricketts et al., 2004). Over 25 years after Newsom-Stewart and Sutphin's introductory study on gender dynamic, literature in SBAE still remains scarce in gender studies and gender related issues (Enns & Martin, 2015). In the meantime, a supply and demand study reflects a significant difference in male and female enrollment in agricultural education (Lawver, et al., 2018).

### **Purpose of the Study**

The purpose of this nonequivalent comparison group quasi-experiment was to evaluate the effectiveness of single-sex classrooms on student career aspirations. The independent variable in this study was the manipulation of learning environments within *Principles to Agriculture* courses by mediating the composition of classrooms to either single-sex classrooms (treatment; X+) or coeducational classrooms (control; X-). Analyses between X+ and X- were conducted along with analyses between the four levels of the independent variable: X<sub>+1</sub> (boys in treatment group), X<sub>+2</sub> (girls in treatment group), X<sub>-1</sub> (boys in control group), and X<sub>-2</sub> (girls in the control group). The dependent variables included general career interest and agricultural career interest. The following research objectives and hypotheses guided the scope of the study:

RO1: Examine student interest of X<sub>+1</sub>, X<sub>+2</sub>, X<sub>-1</sub>, and X<sub>-2</sub> in 16 career pathways.

RO2: Examine student interest of X<sub>+1</sub>, X<sub>+2</sub>, X<sub>-1</sub>, and X<sub>-2</sub> in 8 agriculture career pathways

H<sub>02</sub>: The gain in student interest in the eight agricultural career pathways, over the course of six months, are the same for X+ and X-.

H<sub>02</sub>: The gain in student interest in the eight agricultural career pathways, over the course of six months, are the same for X+ and X-.

### **Methodology**

The untreated control group design with dependent assessments (Shadish et al., 2002), frequently called the nonequivalent comparison group design, was utilized in this study. This quasi-experimental design is recommended in educational field research for ethical, practical, and legal reasons (Steiner et al., 2009). The intervention for this quasi-experiment was separating the *Principles of Agriculture* (PoA) courses in homogenous, same-sex classrooms. The intervention was randomly assigned to three of the six selected schools to form the treatment group (Group A) following a selection protocol for participating schools over a 15-week semester. The study followed all protocols, confidentiality, and safety measures approved by the university's Institutional Review Board (IRB).

The assessment of threats to internal validity, also known as ambiguous temporal precedence (Shadish et al., 2002), is a critical methodological approach for a quasi-experimental design (Creswell & Creswell, 2018; Martin & Bridgmon, 2012; Cook & Steiner, 2010). Actions were taken in this study to minimize potential threats to internal validity. Threats to internal validity that were addressed in the design included history, maturation, regression to the mean, participant selection, study attrition, and diffusion of treatment.

Inclusion and exclusion criteria were used to recruit a study sample with certain characteristics and control for extraneous variables (Creswell & Creswell, 2018). Five inclusion criterias were implemented to recruit a sample that included geographical location of the school; multi-teacher programs; at least one female and one male teacher; three sections of a PoA course; and willingness to teach to the state's set standards for PoA.

Forty-three schools met the inclusion criterion and were contacted through an initial recruitment e-mail. After a plethora of recruitment efforts and following an experimental research design meeting with the interested schools, five school (ten classrooms) were able to obtain all the requirements for the experimental design. As a result, three schools (six classrooms) served as treatment (single sex classrooms) and two schools (two classrooms) served as a control

(coeducational classrooms). Each school was located in a rural, primarily Caucasian, farming community (Kentucky Department of Education, 2016).

A total of 191 freshman students enrolled in their first year of high school (14-16 years of age) participated in this study. Of this sample, 102 (53.4%) were female students and 89 (46.6%) were male students. A total of 144 (76 female students, 68 male students) students were placed into single-sex classrooms as the treatment group, and the remaining 47 students (26 female students, 21 male students) stayed in coeducational classrooms as the control group. Student participants, and their parents, in the treatment group (same-sex classrooms) had the option to opt-out into a traditional coeducation classroom. Fortunately, No students or parents opted-out.

Analyses between X+ and X- were conducted along with analyses between the four levels of independent variable: X<sub>+1</sub> (boys), X<sub>+2</sub> (girls), X<sub>-1</sub> (boys), and X<sub>-2</sub> (girls). The dependent variables included the Career Pathway Interest questionnaire and the Agricultural Career Pathway Interest questionnaire.

Data collected from each student was inputted into IBM Statistical Package for Social Sciences® (SPSS) v26 for data analysis. As recommended by Field (2018), descriptive analyses (e.g., means, standard deviations, skew, kurtosis, histograms) of the data and examined items for normality (Shapiro-Wilk test and Levene's test). A *strict* confidence level ( $\alpha < 0.05$ ) was established for statistical test required in investigating the research objectives.

### Findings/Results

Boys in the treatment group (X<sub>+1</sub>) had the highest interest in an AFNR career ( $m = 6.49$ ;  $SD = 3.13$ ) with education and training ( $m = 4.95$ ;  $SD = 3.15$ ) being the eighth highest. Girls in the treatment group (X<sub>+2</sub>) had the highest interest in health science ( $m = 8.49$ ;  $SD = 4.11$ ) with education and training ( $m = 7.70$ ;  $SD = 3.93$ ) being third and AFNR ( $m = 7.35$ ;  $SD = 3.68$ ) being fourth. Boys in the control group (X<sub>-1</sub>) had the highest interest in architecture and construction ( $m = 7.63$ ;  $SD = 3.48$ ), with AFNR ( $m = 7.16$ ;  $SD = 3.20$ ) ranking fourth and education and training ( $m = 6.63$ ;  $SD = 4.10$ ) ranking ninth. Girls in the control group (X<sub>-2</sub>) had the highest interest in human services ( $m = 7.58$ ;  $SD = 4.44$ ), with AFNR ( $m = 6.74$ ;  $SD = 2.88$ ) ranking sixth and education and training ( $m = 5.89$ ;  $SD = 2.93$ ) ranking eleventh out of the 16 pathways.

The second research objective sought to examine student interest of X<sub>+1</sub>, X<sub>+2</sub>, X<sub>-1</sub>, and X<sub>-2</sub> in eight agriculture career pathways. Boys in the treatment group (X<sub>+1</sub>) had the highest interest in agricultural education ( $m = 5.23$ ;  $SD = 3.15$ ) while both girls in the treatment group (X<sub>+2</sub>) and boys in the control group (X<sub>-1</sub>) had agricultural education ( $m = 5.59$ ;  $SD = 2.79$  /  $m = 6.00$ ;  $SD = 3.16$ ) as their fourth highest interest. Girls in the control group (X<sub>-2</sub>) ranked agricultural education ( $m = 5.33$ ;  $SD = 3.03$ ) fifth in their areas of interest. Global agricultural systems was the only career interest that ranked in the top three of all groups.

The students in the single-sex classroom had a gain in their interest in the AFNR career pathway ( $m = 1.82$ ;  $SD = 3.77$ ). By comparison, the students in the coeducational classrooms had a smaller gain in interests for the AFNR pathway ( $m = .56$ ;  $SD = 3.07$ ). The one-way ANOVA determined a statistically significant difference in the gain of students' interest in the AFNR career pathway between the treatment and control group,  $F(1, 161) = 3.74$ ,  $p = .035$ ,  $\eta^2 = .023$ .

Thus, the null hypothesis was rejected, and the alternative hypothesis was supported, the students in single-sex classrooms ( $X^+$ ) had a significantly larger gain in interests in the AFNR pathway than students in the coeducational classrooms ( $X^-$ ).

The one-way ANOVA was associated with a statistically nonsignificant difference in the gain of students' interest in each of the agricultural career pathways between the treatment group and control group; thus, the researcher failed to reject the null hypothesis, the students in single-sex classrooms had a nonsignificant interest in a specific agricultural career pathway than the students in the coeducational classrooms.

### **Conclusions/Implications/Recommendations**

As stakeholders strive to enhance academic performance, the findings of this study may lead to improved quality of secondary teaching. The evaluation of the effectiveness of single-sex classrooms in this study can inform decision makers (on advantages of different learning environments. Although many scholars have studied same-sex classrooms, few have done so in public school classrooms (Pahlke et. al, 2014).

At the end of the study, the boys in the treatment group ( $X_{+1}$ ) had the highest interest in the agricultural, food, and natural resources career pathway compared to  $X_{+2}$ ,  $X_{-1}$ , and  $X_{-2}$ . They also ranked it highest in interest level among all 16 career pathways. No other group ( $X_{+2}$ ,  $X_{-1}$ , and  $X_{-2}$ ) ranked the agricultural, food, and natural resources pathway as one of their top three career pathways of interest. For  $X_{-2}$ , the agricultural, food, and natural resources pathway was not in their top five career pathways.

Intriguingly, all four groups ( $X_{+1}$ ,  $X_{+2}$ ,  $X_{-1}$ , and  $X_{-2}$ ) ranked the science, technology, engineering, and mathematics (STEM) course in the bottom three career pathways of interest. According to Scherer and colleagues (2019), the incorporation of STEM in agricultural curriculum is noted to increase student motivation. However, the findings indicate that the freshman students, despite treatment or control, are less interested in the STEM career pathway.

Secondary teachers are recommended to seek professional development to deconstruct gendered stereotypes in careers so that girls and boys are empowered to enter careers without the influence of what is deemed appropriate by teachers and society. If a strategic goal of agricultural education is to incorporate more STEM concepts into the national curricula (Scherer et al., 2019), then providing teacher professional development for the destigmatizing of gender stereotypes in STEM careers is a necessary pursuit of national agricultural educator teacher preparation programs. But first, agricultural education scholars need to empirically investigate how to destigmatize gender stereotypes in STEM careers.

Boys ( $X_{+1}$ ,  $X_{-1}$ ) ranked the agricultural education in their top three agricultural career pathways of interest. Boys in the treatment group ( $X_{+1}$ ) displayed higher interest in agricultural education, as they ranked the agricultural education career pathway number one. In comparison, boys in the control group ( $X_{-1}$ ) ranked agricultural education as their third highest pathway of interest. Girls ( $X_{+2}$ ,  $X_{-2}$ ) did not rank agricultural education in their top three agricultural career pathways.

Garter and Swan (2018) advocate that to meet the need of a growing teacher shortage on the state and national level, intentional recruitment efforts are needed. Knight (1988) reported 95% of agriculture teachers in the United States were men. Now, only 29% of agricultural education program completers – those who complete accredited agricultural education teacher preparation program – were men (Smith, et al., 2019). Yet, the results from this study suggest that freshman boys are more interested in the agricultural education career pathway compared to freshman girls.

Teacher preparation programs are recommended to initiate recruitment programs that intentionally target boys in their freshman year of high school. Waiting until senior year to recruit boys to pursue a career in agricultural education may be too late. The researchers do not discount the importance of teacher preparation programs to recruit young women into the profession nor do the researchers find issue with the high number of young women entering the profession. However, the findings suggest that teacher preparation programs may fail to recruit boys who are interested in agricultural education, particularly early in their high school years.

Since No Child Left Behind (NCLB), over 1,000 school districts across the United States have implemented some degree of single-sex education (Klein et al., 2014). As more public-schools ratify single-sex learning environments it is important for research to determine the effects. Since this study is limited to the SBAE students in Kentucky, replication of this study in other context will assist in understanding the effects of single-sex classrooms.

The significance of this study was underscored by the call to answer critical methodological issues in previous study whereas: (a) quasi-experiential design is utilized; (b) conducted in a public school setting with traditionally trained teachers, larger class size, and more representative socioeconomic status; and (c) students will represent the demographics of the community (Palike et al., 2014). Future single-sex classroom studies are recommended to utilize similar methods. Future studies are recommended to examine the influence of single-sex classrooms over the course of a full academic year. Other longitudinal studies that evaluate this line of inquiry throughout high school (i.e., sophomores, juniors, and seniors) would benefit the scholarship.

The students in single-sex classrooms had a significant gain in their interest in the AFNR career pathway. The finding is important since this intervention occurred over a 15-week semester. According to Lundry et al. (2015), the primary goal of SBAE is to develop the necessary knowledge and skills that are necessary for employment in the agriculture industry. However, students must first have interest in the AFNR career pathway. The results of this study showed a relatively quick (over 15-weeks) increase in student interest in agriculture, food, and natural resource of those in single-sex classrooms.

The researchers failed to reject the null hypothesis and concluded that there was no statistically significant gain in student interest in the eight agricultural career pathways. Thus, the single-sex treatment did not have a greater effect on student interest in the eight agricultural career pathways during the 15-weeks. However, the researcher believes that a longitudinal data may reveal significant gain of student interest among the treatment group.



Longitudinal studies that measure the effects of single-sex classrooms would aid a discrepancy in the literature. The findings of longitudinal studies may indicate how single-sex classrooms influence student outcomes throughout their academic progression. The short duration of this study may have a limiting factor. It should be noted, that the researchers do hypothesize that if MANOVA was performed that looked at significant gains between sex and treatment/control, that boys in the treatment would be significantly higher than any other group toward the agricultural education career pathway.

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# **The Effects of Survey Response Mode and Incentives on Response Rates**

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## **Introduction**

Agricultural education is by nature an applied, social science discipline where scholars use survey research methodologies most frequently when studying populations (Doss et al., 2021; Dyer et al., 2003). However, survey response rates are declining in our research, possibly affecting the strength of our most frequently used methodology. Lindner et al. (2001) reported an average response rate of 81.6% for articles published using survey research in the *Journal of Agricultural Education (JAE)* from 1990 through 1999. Later, Johnson and Shoulders (2017) reported an average response rate of 56.3% for articles published from 2006 through 2015.

Declining survey response rates in the field of agricultural education inversely leads to increased nonresponse and therefore the possibility of nonresponse error. When a portion of the sample fails to respond to a survey by not returning a questionnaire, it can result in a biased sample (Bordens & Abbott, 2018). Results of a sample not representative of the population from which it was drawn can be a threat to the external validity of the study when attempting to generalize beyond those who were surveyed (Fraenkel et al., 2019).

While studies have recommended ways to handle nonresponse once it occurs in agricultural education research, little work has been done to address increasing response from the start (Johnson & Shoulders, 2017; Lindner et al., 2001; Miller & Smith, 1983). Higher response rates do not necessarily eliminate nonresponse error; however, “it is important to recognize that higher response rates do reduce the likelihood of nonresponse error and thus provide greater credibility to surveys’ results than do lower response rates” (Dillman et al., 2014, p. 6). Increasing the number of contacts with participants, providing incentives, and survey mode selected can have the greatest effect on survey response rates (Ary et al., 2014; Dillman et al., 2014; Fraenkel et al., 2019). In agricultural education survey research, it is common to contact participants multiple times; however, few studies use an incentive nor use a survey mode other than web-based (Doss et al., 2021). Do these current practices achieve the best response rate possible?

The mission of the American Association for Agricultural Education (n.d.) is “to foster excellence in the discovery and exchange of evidence-based solutions for social science challenges in agriculture and related sciences.” For discovery and evidence-based solutions to occur at a level of high quality, methodologies in agricultural education research must continue to improve. Many recommendations for improving survey response rates come from general public opinion research but can have varying results in different contexts and settings (Park & Tsuchiya, 2021). Researchers outside of agricultural education recommended testing recommendations for improving survey response within specific contexts and populations, providing a need for this study (Neal et al., 2020; Park & Tsuchiya, 2021).

## **Purpose and Objectives**

The purpose of this study was to determine the effects of survey response mode and incentives on response rates when surveying school-based agricultural education (SBAE) teachers. The research objective and hypotheses that guided this study were:

1. Determine the main effect of providing an incentive, the main effect of survey mode, and the interaction effects of incentive and survey mode on response rates.  
H<sub>0a</sub>: There is no significant difference in response rates between groups receiving an incentive and groups receiving no incentive.  
H<sub>0b</sub>: There is no significant difference in response rates between groups based on survey mode received.  
H<sub>0c</sub>: There is no significant difference in response rates based on the interaction of incentive and survey mode.

## **Review of Literature and Theoretical Framework**

From a review of literature, it quickly becomes apparent there are many variables influencing the decision to respond to a survey. Attitude toward surveys, questionnaire appearance and content, number of contacts made, providing incentives, and data collection mode used are all major categories influencing response rates and within each category there are multiple variables at work (Ary et al., 2014; Fraenkel et al., 2019; James & Bolstein, 1990; Leeper, 2019; Mertler & Charles, 2011; Rogelberg et al., 2001; Ye, 2007). To narrow down the variables of interest, we chose to study the use of incentives and survey response modes because of their ability to have larger impacts on survey response rates and because of how they are currently used in agricultural education research (Dillman et al., 2014; Doss et al., 2021).

The use of incentives is the second-best way to increase response rates behind making multiple contacts (Dillman et al., 2021). Including a cash or material incentive encourages reciprocity and increases trust in the survey (Ary et al., 2014; Dillman et al., 2021). To obtain the greatest response rate and return on investment, researchers have determined the best time to provide an incentive in the survey process is up front with the initial invitation to participate (Ary et al., 2014; Dillman et al., 2014; James & Bolstein, 1990; Mercer et al., 2015). Studies have found \$1.00 - \$2.00 is adequate to increase response rates substantially with \$2.00 providing the best results (Dillman et al., 2014; James & Bolstein, 1990).

A survey mode is the platform or media in which a survey is conducted (Dillman et al., 2014). It is important to recognize mode can refer to both the communication between the researcher and the participant and the response media used by the participant to return the questionnaire. Modes of data collection include direct administration, personal interviews, mail, telephone, email, and web-based surveys (Dillman et al., 2014; Fraenkel et al., 2019; Gay et al., 2012; Mertler & Charles, 2011). Historically, the face-to-face mode was used most commonly through the 1970s, then telephone and mail became the prominent collection modes, leading to email and web modes as the most common data collection method today (Roberts, 2007).

When examining response rates by survey mode, mail surveys result in the highest response rates (Dillman et al., 2014; Messer & Dillman, 2011; Olson et al., 2012). Dillman et al. (2014) suggested mail surveys can achieve 50% response rates or more if implemented correctly. Response rates for web surveys are generally the lowest of any mode (Dillman et al., 2014; Messer & Dillman, 2011; Olson et al., 2012; Ye, 2007). Ye (2007) claimed 20-35% response rates were common in web surveys. In a mixed-mode experiment conducted by Messer and Dillman (2011), 44-52% response rates were achieved. Research has shown mixed-mode surveys can achieve higher response rates than web only surveys and can be as high as mail only surveys for a fraction of the cost (Dillman et al., 2014; Greenlaw, 2006; Millar & Dillman, 2011).

The social exchange theory guided this study. Blau (1964) described social exchange as “voluntary actions of individuals that are motivated by the returns that are expected to bring and typically do in fact bring from others” (pp. 91-92). Within the context of survey response, social exchange theory is applied in that “people are more likely to comply with a request from someone else if they believe and trust that the rewards for complying with that request will eventually exceed the costs of complying” (Dillman et al., 2014, p. 24).

The application of social exchange theory to this study is simple. Providing the participant with a survey creates a feeling of obligation in the participant to reciprocate. The presence of mixed-modes or incentives can increase the feeling of obligation. The survey itself, presence of an incentive, and providing mixed modes all can influence costs to the participant, benefits to the participant, and establishment of trust. The overall balance of costs, benefits, and trust influence the decision to reciprocate leading to completion of the survey and returning it to the researcher.

## Methods

The research design for this study was an experimental, two-way, between-subjects, factorial design with eight treatment groups (Maxwell et al., 2018). The two independent variables were survey response mode and incentive. For survey response mode, there were four types: mail only, web only, mail + web, and web + mail. For the incentive variable there were two levels: received a \$2 incentive and did not receive a \$2 incentive. The levels of each independent variable make this a 2 X 4 design. Subjects were randomly assigned to one of eight treatment groups shown in Table 1 after IRB approval was obtained at Texas Tech University.

**Table 1**  
*Treatment Groups Used in this Study for Comparison*

Response Mode (B)	\$2 Incentive (A)	
	Yes (A <sub>1</sub> )	No (A <sub>2</sub> )
Mail Only (B <sub>1</sub> )	Group 1 (A <sub>1</sub> B <sub>1</sub> )	Group 5 (A <sub>2</sub> B <sub>1</sub> )
Web Only (B <sub>2</sub> )	Group 2 (A <sub>1</sub> B <sub>2</sub> )	Group 6 (A <sub>2</sub> B <sub>2</sub> )
Mail + Web (B <sub>3</sub> )	Group 3 (A <sub>1</sub> B <sub>3</sub> )	Group 7 (A <sub>2</sub> B <sub>3</sub> )
Web + Mail (B <sub>4</sub> )	Group 4 (A <sub>1</sub> B <sub>4</sub> )	Group 8 (A <sub>2</sub> B <sub>4</sub> )

The target population of this study was all SBAE teachers in the United States. According to the National Association of Agricultural Educators (2020), there are approximately 12,000 SBAE teachers in the nation. The sampling procedure used for this study was stratified random

sampling. Participants were stratified proportionate to the number of FFA chapters in the state compared to the nation. Lists of active FFA chapters were available online for each state and the needed number of chapters were randomly selected from each list. After the chapters were identified, specific agricultural education teachers were identified for each chapter through published online state SBAE teacher directories or by viewing individual school websites. G\*Power was used to estimate the desired sample size to accomplish the level of power needed based on expected effect size as recommended by Johnson and Shoulders (2019). A sample size of 1,095 was determined in G\*Power (Faul et al., 2007). Each of the eight treatment groups needed 137 participants for a total sample size of 1,096.

The instrument used in this study was a researcher designed questionnaire measuring challenges faced by SBAE teachers. Consistency of appearance was maintained across both paper and online modes. The instrument was an eight-page questionnaire on the paper format and one continuous page for the online format. The instrument was pilot tested with 60 SBAE teachers in Texas who were not included in the main study. Fifteen surveys from each response mode were sent to the pilot test group to make sure communication and response modes were conducted properly and to address any logistical concerns before conducting the main study. A total of 40 SBAE teachers responded to the pilot test for a 66.67% response rate.

Timing for all contacts was consistent across all response modes. A prenotice email was sent to participants two days after the initial invitation to participate was mailed allowing time for mail delivery to teachers' physical addresses. The first reminder email was sent two weeks following the mailing of the invitation to respond with a copy of the questionnaire/online instructions to allow for returned completed surveys and the opportunity to correct undeliverable addresses. All additional reminders and contacts were made at one-week intervals. Table 2 summarizes the contact procedures used.

**Table 2**  
*Contact Procedures Used*

Contact	Procedure
1 <sup>st</sup>	Prenotice Email
2 <sup>nd</sup>	Mailed Invitation Letter, Paper Copy or Link to Questionnaire, (\$2, If Applicable)
3 <sup>rd</sup>	Emailed Reminder to Complete Questionnaire
4 <sup>th</sup>	Emailed Reminder to Complete Questionnaire
5 <sup>th</sup>	Mailed Reminder w/Another Copy/Link to Questionnaire (Mode Switch)
6 <sup>th</sup>	Emailed Final Reminder to Complete Questionnaire

*Note.* Refer to Table 1 for determining receipt of incentive and mode.

Data were compiled in Qualtrics for web surveys and manually entered into a Microsoft Excel spreadsheet for mail/paper surveys. All data for this study were analyzed in IBM SPSS version 26. To test the hypotheses, a two way, between-subjects, factorial ANOVA was calculated. Significance was established *a priori* at  $p \leq 0.05$ .

## Results



With all eight experimental groups combined, there were 444 responses completed for an overall response rate of 40.85%. Response rates for each experimental group ranged from 31.85% ( $n = 43$ ) for Group 8 to 51.85% ( $n = 70$ ) for Group 2. A total of 227 (51.13%) paper responses were completed with the combined eight groups, while 217 (48.87%) online responses were completed. Response rates achieved for each experimental group is presented in Table 3.

**Table 3**

*Achieved Response Rates for Experimental Groups by Response Mode ( $N = 444$ )*

Group	Paper		Web		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1 ( $n = 137$ )	66	48.18	0	0.00	66	48.18
2 ( $n = 135$ )	0	0.00	70	51.85	70	51.85
3 ( $n = 135$ )	52	38.52	12	8.89	64	47.41
4 ( $n = 137$ )	10	7.30	51	37.23	61	44.53
5 ( $n = 135$ )	45	33.33	0	0.00	45	33.33
6 ( $n = 137$ )	0	0.00	47	34.31	47	34.31
7 ( $n = 136$ )	43	31.62	5	3.68	48	35.29
8 ( $n = 135$ )	11	8.15	32	23.70	43	31.85
Total ( $N = 1,087$ )	227	20.88	217	19.96	444	40.85

The first hypothesis tested for this objective was the main effect on response of providing an incentive. The results indicated there was a significant difference on the main effect among groups depending on receipt of an incentive with  $F(1, 1,079) = 22.75, p < .001$ , and  $\eta^2 = .01$ . Given this information, the null hypothesis was rejected. The second hypothesis tested was the main effect on response for different response modes. According to the ANOVA summary table, there is no significant difference between groups based on response mode ( $F(3, 1,079) = 0.46, p = 0.711, \eta^2 < .01$ ). We fail to reject the null hypothesis. The final hypothesis tested was the interaction effect of mode and incentive on response. The results indicated there was no significant difference between groups based on the interaction effect with  $F(3, 1,079) = 0.24, p = 0.208$ , and  $\eta^2 < .01$ . Since the null hypothesis was not rejected, no *post hoc* comparisons were needed. The complete ANOVA summary table for Objective One is presented in Table 4.

**Table 4**

*Factorial ANOVA Summary Table Comparing Experimental Groups ( $N = 1,087$ )*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	$\eta^2$
Incentive	5.41	1	5.41	22.75	<0.001	.01
Mode	0.33	3	0.11	0.46	0.711	<.01
Mode*Incentive	0.15	3	0.05	0.24	0.208	<.01
Error	256.59	1,079	.24			

### Conclusions, Implications, and Recommendations

From the results of this experiment, it can be concluded providing an incentive significantly increases survey response rates with SBAE teachers. In this study the increase ranged from approximately 12% to 17% more responses. The significance of providing an incentive on response rates was to be expected since it has been recommended by many as the second most

effective way to increase responses (Ary et al., 2014; Dillman et al., 2014; James & Bolstein, 1990; Mercer et al., 2015; Mertler & Charles, 2011). Incentives increased survey response with SBAE teachers at similar rates found in the literature, confirming findings of other studies with a different population. Increases in response across all modes may indicate an incentive pulls in respondents who normally would not answer with the potential to reduce nonresponse bias, a benefit highlighted by Dillman et al. (2014).

Response mode used had little influence on SBAE teacher response rates; however, effect size was very small making this difficult to detect with our selected sample size. This conclusion was contradictory to what others have found where mail surveys resulted in the highest response rates (Dillman et al., 2014; Messer & Dillman, 2011; Olson et al., 2012). Online-only group response rates exceeded mail-only groups regardless of incentive, although these differences still were not significant. Literature indicated mail surveys could achieve 50% or greater response rates (Dillman et al., 2014), however 50% response was not achieved in either group regardless of incentive use. Several studies indicated web response rates were the lowest of any survey mode (Dillman et al., 2014; Messer & Dillman, 2011; Olson et al., 2012; Ye, 2007). This was not the case with SBAE teachers. When an incentive was provided, online was the mode receiving the greatest response. For mixed-mode studies, Messer and Dillman (2011) found that 44-52% response rates could be achieved. Response rates for both mixed-mode groups receiving an incentive fell in this range, however those not receiving an incentive were less. SBAE teachers also did not produce significant differences in response rates with mixed modes based on the sequence of mixing the modes. Finally, there was no significant interaction effects found on response rates from incentives and response mode. This indicates that incentives had the same effect across all response modes used in this study.

Through the lens of social exchange theory, incentives appear to be an additional element that impacts SBAE teachers' decision to respond to a survey. Dillman et al. (2014) suggested the chances of convincing participants to respond are higher when many aspects of a survey request work together to encourage response. This was observed in this experiment when comparing differences in response rates for groups based on incentive. Mode, on the other hand, does not seem to significantly contribute to the decision to respond or have an effect on perceived costs, benefits, and trust when surveying SBAE teachers.

Recommendations for practice include using incentives and over sampling when studying SBAE teachers. Incentives should be used to gain better response rates from this population when budget allows. Since survey data collection mode used does not impact response rates, other factors such as completion rates, quality of data across modes, and cost would influence the mode decision. Oversampling may be used to reach a desired sample size based on results from specific conditions in this study. Oversampling could be used to strengthen power of a study. In fact, Ary et al. (2014) and Dillman et al. (2014) recommended oversampling to achieve a desired sample size. However, oversampling does not necessarily fix the problem of nonresponse error if those responding are still different from those who are not responding (Fraenkel et al., 2019). Nevertheless, it is widely accepted higher response rates are less likely to have nonresponse bias than lower response rates (Ary et al., 2014; Dillman et al., 2014; Fraenkel et al., 2019).

Further research should be conducted on the effects of contact mode used to improve response rates rather than response mode. Mixed contact modes were used across all experimental groups; however, this is not really used often in agricultural education research (Doss et al., 2021). Communication was the largest expense in this study, even above incentives. Information from research conducted based on contact mode may help identify more efficient ways to save money when conducting surveys. Qualitative research should be used to determine why some SBAE teachers do not respond to surveys. Finally, it is recommended this study be replicated with other frequently studied populations relevant to agricultural education research broadly defined.

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## **Identifying Challenges Faced by School-Based Agricultural Education Teachers**

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### **Introduction**

Shortages of school-based agricultural education (SBAE) teachers have been a documented concern in secondary public schools dating back to the Smith-Hughes Act in 1917 and continuing forward to the present (Eck & Edwards, 2019; Hillison, 1987; Smith et al., 2017). Studies in agricultural education research generally attribute the cause of this issue to either agricultural teacher education graduates not entering the field upon graduation or teacher attrition among those in the field (Hainline et al., 2015; Lawver & Torres, 2011; Murray et al., 2011; Parmley et al., 1979; Roberts et al., 2009; Sorenson et al., 2016). The focus of this study lies with teacher attrition. This topic has been studied from several different vantage points including the impact of job satisfaction on retention, factors impacting early career teachers, and why teachers chose to stay in the profession (Clark et al., 2014; Greiman et al., 2005; Walker et al., 2004).

However, according to Boone and Boone (2009), attrition often can be linked to the number and types of problems teachers face and a teacher's success or failure can be dependent on their ability to solve those problems. Problems or challenges can be linked directly to job satisfaction. Walker et al. (2004) proposed that unsatisfied individuals would not likely remain in the teaching profession. Numerous studies have examined SBAE teacher job satisfaction and found SBAE teachers were generally satisfied with their jobs (Castillo et al., 1999; Clemons & Lindner, 2019; Hasselquist et al., 2017; Kitchel et al., 2012). However, studies identifying challenges or problems faced by SBAE teachers generally focus on a particular area within agricultural education such as teaching, FFA, supervised agricultural experiences (SAE), or personal factors. These studies are often limited to one state or region and are not modern in their publication (Boone & Boone, 2009; Mundt & Connors, 1999; Myers et al., 2005).

For agricultural teacher education programs to more effectively help address the shortage of SBAE teachers, we must identify what challenges teachers face. According to Joerger (2002), an assessment of teacher needs should be conducted regularly. This would provide university agricultural teacher education programs information to design and implement professional development for teachers in the field and adjust content taught to preservice teachers (Joerger, 2002; Mundt & Connors, 1999; Myers et al., 2005). Identifying challenges faced by SBAE teachers highlights areas where help through professional development may be needed. Boone and Boone (2009) recommended identifying challenges faced by SBAE teachers beyond the state or regional level, giving rise to the need for this study.

### **Purpose and Objectives**

The purpose of this study was to identify challenges faced by SBAE teachers across the nation. The following research objectives were developed to accomplish this purpose:

1. Describe demographic characteristics of SBAE teachers across the nation.
2. Determine how challenges faced by SBAE teachers influence their ability to do their job.

### **Literature Review and Theoretical Framework**

Human capital theory served as the underpinning for this study. According to Becker (1993), investments such as schooling and on-the-job training serve as a source to increase human capital. Increases in human capital can yield returns to individuals and society (Becker, 1993). The increased value in human capital can be used to describe teachers in public school systems (Smylie, 1996). When a person increases their human capital, they improve their competence for performing their trade or vocation (Heckman, 2000). To that end, agricultural teacher education programs can help improve human capital of teachers by providing professional development to increase teacher competence in areas that are challenging. The increased competence could then lead to higher job satisfaction and in turn retention in their field. To accomplish this, challenges need to be identified.

Through a review of literature, we were able to identify specific challenges historically experienced by SBAE teachers. We found most challenges identified in previous studies were able to be classified into one of following areas: relationships between the SBAE teacher and others, classroom teaching activities, overall SBAE program activities and factors, miscellaneous job factors or responsibilities, professional development and advancement activities, and personal factors. Relationships between SBAE teachers and others included working with guidance counselors, other faculty members, teaching partners, administrators, the previous SBAE teacher, students in the program, university faculty, parents, and community members (Boone & Boone, 2009; Clark et al., 2014; Greiman et al., 2005; Ingersoll, 2001; Reeves, 2020; Rosser, 2020; Touchstone, 2015; Walker et al., 2004).

Challenges identified for classroom teaching activities were student motivation, discipline, working with special needs students, class size, low ability students, lesson planning, number of teaching preps, testing mandates, supplies and funding, classroom management, teaching methods, lesson planning, adult education, years of teaching experience, and lab instruction (Boone & Boone, 2009; Greiman et al., 2005; Ingersoll, 2001; Walker et al., 2004). Challenges related to overall SBAE program activities involved keeping up with FFA changes, maintaining a FFA chapter image, budgeting, fundraising, booster clubs, being competitive with livestock SAEs, FFA chapter management, advisory committees, summer programs, managing SAEs, overall program management, finding alternative funding, training LDE and CDE teams, attending fairs and exhibitions, and managing school farms or facilities (Boone & Boone, 2009; Clark et al., 2014; Greiman et al., 2005; Rosser, 2020; Touchstone, 2015; Walker et al., 2004).

Miscellaneous job factors or responsibilities reported in previous studies included challenges with low salary, time management abilities of SBAE teacher, volume of paperwork or record keeping, burnout, stress, organizational skills, school regulations, confidence, workload, state reports, and unsafe work environment (Boone & Boone, 2009; Greiman et al., 2005; Ingersoll, 2001; Touchstone, 2015; Walker et al., 2004). Professional development and advancement activities included undergraduate preparation, professional organization activities, union activities, and professional advancement opportunities (Boone & Boone, 2009; Greiman et al.,

2005; Ingersoll, 2001). Challenges tied to personal factors reported in the literature involved work and home life balance, health, marital status, life crisis, childbirth, family death, financial loss, and legal problems (Boone & Boone, 2009; Clark et al., 2014; Greiman et al., 2005).

Studies within agricultural education have identified many different challenges faced by SBAE teachers. This was certainly not a complete list of challenges faced by SBAE teachers; however, it provides insight into what teachers have faced in the past. This leads to the question do SBAE teachers still face these same challenges? Answers to this question could help agricultural teacher education programs better tailor their professional development opportunities and preservice teacher training techniques to more adequately meet the needs of teachers, keeping them in the field by increasing their human capital.

## Methods

To accomplish the purpose and objectives of this study, a cross-sectional, survey design was employed (Fraenkel et al., 2019). Data for this study were collected as part of a larger experimental study exploring the influence of survey mode and incentive use on response rates. The topic of the questionnaire provided in the experiment was identifying challenges faced by SBAE teachers, thus providing the data for this study. The population considered for this study was all SBAE teachers in the United States. According to the National Association of Agricultural Educators (2020), there was approximately 12,000 SBAE teachers in the nation. The accessible population was all teachers working at an active FFA chapter as listed by the National FFA Organization. Stratified random sampling was used in this study. Participants were stratified proportionate to the number of FFA chapters in the state compared to the nation. Chapters were randomly selected and contact information was obtained for a random advisor of each chapter. G\*Power was used to estimate the desired sample size needed for the experimental portion of the study and resulting in a total sample size of  $N = 1,096$ . This sample size is more than adequate to describe the population according to Krejcie and Morgan (1970).

The instrument used was a 131-item, researcher designed questionnaire measuring challenges faced by SBAE teaching within six constructs: (1) SBAE teacher relationships with school and community personnel (25 items), (2) classroom factors, activities, and responsibilities (32 items), (3) agriculture program factors, activities, and responsibilities (26 items), (4) miscellaneous job factors, activities, and responsibilities (17 items), (5) professionalism and advancement factors, activities, and responsibilities (six items), and (6) personal factors, activities, and responsibilities (eight items). Each item was identified through the review of literature and were rated on a scale by participants measuring influence on ability to do their job. The scale ranged from  $1 = \text{very negative influence}$  to  $6 = \text{very positive influence}$  with an option of not applicable. Demographic information for each participant was also collected.

The instrument was reviewed for content and face validity by seven professors at five different institutions within three different states across the nation with expertise in SBAE teacher education and survey research methods. To establish construct reliability, the questionnaire was pilot tested with 60 SBAE teachers in Texas who were not selected for the main study. A total of 40 SBAE teachers responded for a 66.67% response rate. A Cronbach's alpha was calculated for



each construct, all with results greater than  $\alpha = 0.86$ . Reliability for each construct was acceptable according to Field (2018).

After receiving IRB approval from Texas Tech University, teachers were either mailed a paper copy of the questionnaire or received online access to an identical web questionnaire through Qualtrics. Half of the participants selected for this study received a \$2.00 incentive as required for the experimental study. After waiting two weeks, teachers were sent four reminders to respond, each one week apart. A final response rate of 40.85% ( $N = 444$ ) was achieved. Due to the nature of the experiment, a comparison of construct summated scores of early and late respondents was conducted to control for nonresponse error. There were no significant differences found between the two groups of respondents in any of the constructs.

## Results

Responses were received from 49 out of 50 states across the nation. Slightly over half the respondents ( $n = 227$ , 51.13%) were male. The most frequently reported ethnicity was White or Caucasian ( $n = 415$ , 93.47%). Respondents had an average age of 38.69 years ( $SD = 11.31$ ) and average teaching experience of 13.05 years ( $SD = 10.17$ ). The highest education level obtained by respondents was a bachelor's degree ( $n = 219$ , 49.44%) and master's degree ( $n = 216$ , 48.76%). The majority ( $n = 366$ , 82.43%) were traditionally certified to teach agriculture through an in-person university teacher preparation program. Finally, teachers reported working an average of 51.97 hours per week ( $SD = 14.80$ ). Selected demographic information is presented in Table 1.

Table 1  
*Demographic Breakdown for Survey Participants (N = 444)*

Variable	Characteristic	<i>n</i>	%
Sex	Male	227	51.13
	Female	215	48.42
Ethnicity	White/Caucasian	415	93.47
	Hispanic/Latino	14	3.15
	Native American/Alaskan Native	7	1.58
	Black/African American	2	0.45
	Multiracial/Biracial	2	0.45
	Asian/Pacific Islander	1	0.23
Highest Degree	Associate's	3	0.68
	Bachelor's	219	49.44
	Master's	216	48.76
	Doctoral	5	1.13
Certification Type	Traditional	366	82.43
	Alternative	72	16.22

*Note.* Responses for each variable may not total to 444 due to item nonresponse.

Objective two was to determine how challenges faced by SBAE teachers influenced their ability to do their job. For scale interpretation of influence on ability to do their job, real limits were set at 1.00 to 1.49 = *Very Negative*, 1.50 to 2.49 = *Negative*, 2.50 to 3.49 = *Slightly Negative*, 3.50 to

4.49 = *Slightly Positive*, 4.50 to 5.49 = *Positive*, and 5.50 to 6.00 = *Very Positive*. Constructs 1, 2, 3, and 5 all have positive influences on SBAE teachers' ability to do their job. Constructs 4 and 6 had slightly positive influences on SBAE teachers' ability to do their job. This information is summarized in Table 2.

Table 2

*Average Summated Construct Scores for Influence on Teachers' Ability to do Job (N = 444)*

Construct	N	M	SD
1. SBAE teacher relationships with school and community personnel	444	4.78	0.45
2. Classroom factors, activities, and responsibilities	444	4.51	0.56
3. Agriculture program factors, activities, and responsibilities	442	4.64	0.64
4. Miscellaneous job factors, activities, and responsibilities	441	3.98	0.70
5. Professionalism and advancement factors	442	4.57	0.72
6. Personal factors, activities, and responsibilities	440	4.03	0.95

*Note.* Some construct scores had slightly smaller sample sizes due to item nonresponse.

An individual item analysis was conducted for each construct to determine items with the most and least influence on an SBAE teacher's ability to do their job. The item with the overall highest average score was relationships with student in the agriculture program ( $M = 5.55$ ,  $SD = 0.59$ ). The item with the lowest average for the entire questionnaire was teacher burnout ( $M = 2.73$ ,  $SD = 1.24$ ). The individual items with the highest and lowest average score for each construct is presented in Table 3.

Table 3

*Single Item Average Influence on Ability for Teachers' Ability to do Job (N = 444)*

Item	N	M	SD
Construct 1			
Relationships with Students in the Ag Program	444	5.55	0.59
Influences from the Previous Ag Teacher	371	3.89	1.51
Construct 2			
Years of Classroom Teaching Experience on Teaching Ability	433	5.15	0.85
Intrusions and Interruptions on Teaching Time	428	3.45	1.20
Construct 3			
Role as the FFA Advisor	434	5.25	0.76
Policy Changes within the National FFA Organization	366	3.87	1.00
Construct 4			
Ability to Manage Finances	434	4.95	0.87
Teacher Burnout	401	2.73	1.24
Construct 5			
State Professional Organization Activities	416	4.84	0.93
Teacher's Union Activities	276	3.84	1.16
Construct 6			
Marital Status	389	4.72	1.23
Legal Problems	140	3.14	1.45

*Note.* Total N for each item may not be 444 due to participants indicating N/A.

## **Conclusions, Implications, and Recommendations**

From the demographic data collected in this study, it can be concluded the national population of SBAE teachers is becoming more evenly split between male and female teachers, aligning with findings of previous studies and indicating a representative sample of the population (Lawver et al., 2018). The profession is also largely made up of White or Caucasian teachers. When examining education obtained by SBAE teachers, we found there was a near even split between teachers earning bachelor's degrees and teachers earning master's degrees. SBAE teachers also were mostly traditionally certified.

The purpose of this study was to identify challenges faced by SBAE teachers so that agricultural education teacher preparation programs may be able to increase human capital by providing support or professional development in areas that are challenging teachers. Personal and miscellaneous job factors, activities, and responsibilities are two areas that have only slightly positive influences on SBAE teachers' ability to do their jobs. This confirms previous findings where items related to these areas negatively influenced SBAE teachers' ability to do their jobs (Clark et al., 2014; Touchstone, 2015; Walker et al., 2004). Within the miscellaneous job factors, teacher burnout was the item most negatively impacting SBAE teachers' ability to do their job, highlighting an ongoing problem identified by previous research (Boone & Boone, 2009).

SBAE teacher relationships, agriculture program and classroom factors, activities, and responsibilities, and professional/advancement factors all positively influenced SBAE teachers' ability to do their job. This may indicate some improvement over findings from previous studies (Boone & Boone, 2009; Greiman et al., 2005; Ingersoll, 2001; Walker et al., 2004). Within each construct we find specific items or factors that have negative or slightly negative influences on SBAE teachers' ability to do their job, however the overall influence of these general areas is positive. The single item with the most positive influence on SBAE teachers was relationships with students in the agriculture program. This indicates SBAE teachers enjoy relationships with their students, and this may be a driving factor for keeping teachers in the field.

Based on the findings and conclusions of this study, several recommendations for practice emerge. We recommend agricultural education teacher preparation programs provide additional training for current students and teachers already in the field on managing the miscellaneous activities related to teaching. With burnout identified as the most negative factor, strategies should be developed and taught to teachers to effectively deal with this challenge, thereby increasing their human capital, resulting in retention in the field. Communicating ways to deal with personal life factors may be useful for SBAE teachers. While we cannot control what happens in teachers' personal lives, we may be able to help them better prepare for how to deal with challenges as they arise related to their performance at work. Legal challenges were the most negative personal influence for SBAE teachers. This might be an area in which state professional organizations could help.

There are several opportunities for additional research related to challenges faced by SBAE teachers. Within the area of teacher burnout, we recommend identifying teachers who have had this challenge and determine strategies used to overcome it, resulting in retention in the field. The development of a job satisfaction instrument could also be useful to the profession to better

predict when a teacher may be on the verge of quitting. Further research should also be conducted to determine best practices for dealing with negative miscellaneous and personal factors, activities, and responsibilities. Studies identifying challenges faced by SBAE teachers should be periodically conducted in the future so we can continue to tailor how we teach our courses at the university and provide adequate support for teachers in the field.

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# Evaluation of Cultural Diversity in Secondary Agricultural Textbooks

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## Abstract

*Textbooks have the unique ability to provide snapshots of industry norms, including biases which may be present, through real-world applications and depictions of concepts for various subjects defining the individuals, values, concepts, and skills that are considered legitimate in a discipline (Becker & Nilsson, 2021). Using a cross-sectional descriptive study researchers used social semiotics to identify and examine sex and race within secondary agriculture education textbooks from the largest US textbook publishers. The researchers evaluated 34,161 pages, 4,603 photos, and 585 case studies from 58 textbooks. Students of color currently in the secondary agricultural education classroom are not seeing themselves represented in agriculture textbooks as it relates to the enrollment in public schools. The absence of females is present among various disciplines in the agriculture field as well. The lack of diversity and representation present in the textbooks is blatant and may send unintended messages to female and BIPOC students within secondary agricultural education classrooms. Further research is needed that explores gender nonconformities, colorism, and intersectionalities of race and gender representation in secondary agriculture textbooks.*

## Introduction

Within the classroom, both students and teachers interact, and depend heavily on textbooks. Textbooks can be used to show students in classrooms real-world application of concepts for various subjects and define the individuals, values, concepts, and skills that are considered legitimate in a discipline (Becker & Nilsson, 2021). Textbooks are used as a classroom resource and can be in a physical form or an online e-book media. The curriculum within each, aids both students and teachers and may be used as a singular tool or alongside other educational resources (Hajdin & Divjak 2016). Alongside the text are various images and case studies to assist in giving students a well-rounded glimpse into the discipline and concepts associated with the topic.

Classroom textbook use has a positive impact on student success and performance (Van den Ham & Heinze, 2018). Textbooks have the unique ability to provide a snapshot of industry norms, including biases which may be present. These snapshots should introduce students toward a sense of belonging within a field, through representation of various points of interest, including likeness. If a student does not feel belonging within an industry at the secondary level, it can be difficult for the student to pursue a career in the field (Bush & Mattox, 2018; Taboas-Pais & Rey-Cao, 2015). The issue of representation in textbooks has been explored across various disciplines within education (Sánchez, 2019; Cassese & Bos, 2013). When a student feels a sense of belonging within the industry they are studying, they will want to continue to succeed in the industry (Earl, 2020). Included with each image in the textbook are hidden values, biases, and ideologies which students may make their own inferences and judgments about, impacting their sense of belonging (Benattabou, 2021).

Most textbook authors, teachers, administration, and school staff are white (Matias, 2016). This is relevant because textbooks show a vast representation of white male figures, while women and

racial and ethnic minority groups do not have proper representation (Becker & Nilsson, 2021; Simpson et. al., 2021; Brandle, 2020; Bush & Mattox, 2020). This missing representation of *all* students can be discouraging to marginalized students who already face issues like solo status, especially in STEM courses (Hurtado et. al., 2010). Additionally, students within science disciplines can feel implications of stereotype threat by image intake, even though this may not be the intention of the authors or publishing companies (Good et. al., 2010). Analyzing textbooks to determine demographics and representation reveals what students are being exposed to throughout their educational career, and the implicit message that is being exposed to the young developing minds. Issues regarding demographics and representation in textbooks and school resources is not a problem specific to only secondary agricultural education. Specifically, within the field of secondary agricultural education, there has been incredibly limited research regarding textbooks and textbooks demographics.

### **Theoretical Framework**

Semiotics is the study of signs and symbols, the way they are used, and the meaning associated with each sign. Peirce (1955) explains every symbol or image has three parts: the image itself, its object, and its interpretant; the producer of the sign is referred to as the *sign maker*. The sign maker gives intended meanings to using elements from the sign by meaning and form to show relationships (Bezemer & Kress, 2008). In the stop sign example, the sign is the stop sign, the object is stopping, and the interpretant is the intended relationship between the two. Social semiotics is the interpretation of semiotic resources, signs or any observable characteristics, and the meanings associated with the semiotic resources as it pertains to the culture of society. Although the sign maker may have certain intentions for how a sign is to be interpreted, “the plural ‘meanings’ is crucial here, because just as dictionaries cannot predict the meaning which a word will have in a specific context, so other kinds of semiotic inventories cannot predict the meaning” (van Leeuwen, p. 4, 2005). A sign can be interpreted in many ways, and context of signs is dependent on the interpretant. Every individual who observes a sign plays the role of interpretant, and everyone has their own unique lived experience which impacts the context of a sign (Rightler-McDaniels & Hendrickson, 2014).

The first use of social semiotics is Michael Halliday who argues against the separation of linguistics and society, and whose sole focus was to view linguistics as a societal and cultural medium (1978). However, the scholarly works of Hodge, Kress, and van Leeuwen focus social semiotics in societal practice, specifically critical perspectives on society and those who hold power (Hodge & Kress, 1988; Kress & van Leeuwen, 2002; Kress & Selander, 2012).

Studying demographics of textbook images and case studies is important to pinpoint what students may perceive as with every photo, “there is another second order of meaning which carries by and large hidden ideological messages not obvious to a non-alerted eye” this second meaning of photographs may send unintended messages to students (Benattabou, p. 3, 2021). An example of this “non-alerted eye” could be emojis and the intention of the user and the perception of the one receiving the emoji. In the case of textbooks, the “non-alerted eye” would be in reference to students of color who may have different lived experiences than their white teachers or white textbook authors. This is important as demographics of textbooks cannot be used to prove author intent but instead allows researchers to describe with a critical lens what students may be gathering and interpreting as they turn the pages of their textbooks.



Research surrounding social semiotics in education began roughly around 2010 in the fields of STEM, language learning, study abroad programs, and early elementary and the research focuses on the “hidden curriculum” associated with school resources, specifically textbooks (Knain et. al., 2021; Eriksson et. al., 2020; Michelson & Valencia, 2016; Nabifar, 2015; Granly & Maagerø 2012; de Freitas & Zolkower, 2009). However, domestic research surrounding social semiotics and education is minimal. Analyzing textbooks using a social semiotic lens is important to pinpoint the possible messages students are obtaining through textbooks. In the field of agricultural education, studies in both social semiotics and textbooks analysis are not present.

### **Purpose**

The purpose of this descriptive study was to identify the social semiotics of sex and race within images and case studies of the secondary agriculture education textbooks published from the largest publishing companies in the United States. The following objectives sought to assist in the solving the study’s purpose:

Objective 1: Describe the overall demographics present in the secondary agriculture textbooks.

Objective 1: Describe the demographics present in the secondary agriculture textbooks by agricultural discipline.

Objective 2: Describe the demographics present in the secondary agriculture textbooks by textbook publisher.

In order to determine if the demographics found are a significant difference to the cultural norms within US public schools, the following research hypothesis were developed:

Ho1: There will be no difference between observed sex (male and female) and expected (public school enrollment) values of the textbooks by discipline.

Ho2: There will be no difference between observed sex (male and female) and expected values (public school enrollment) of the textbooks by publisher.

Ho3: There will be no difference between observed race (white and BIPOC) and expected (public school enrollment) values of the textbooks by discipline.

Ho4: There will be no difference between observed race (white and BIPOC) and expected values (public school enrollment) of the textbooks by publisher.

### **Methods**

This study utilized a descriptive cross-sectional research design. Cross-sectional research design studies are descriptive in nature and take place in a single moment in time and are used to determine prevalence of an outcome in a population (Levin, 2006). This study observed textbooks to capture the demographics present in secondary agricultural education textbooks that were available for teachers during the 2021 academic school year by the leading textbook publishers. Using descriptive cross-sectional research is useful in social sciences, as it allows researchers to observe a cross-section of the population within a short amount of time, allowing research to show current trends (Lunenburg & Irby 2007). The researchers conducted this study with a transformative lens in which the researchers are interested in marginalized populations and the power relationships present in society (Creswell, 2017).

Currently, the United States has 33 secondary textbook publishers (Hickey & Jones, 2012). This population was chosen as researchers wanted to determine differences, if any, were present among publishing companies. To create a fair sample which may be more representative of the

current agricultural science classroom, researchers utilized textbooks published between 2011-2021 from the top five publishing companies: Cengage Learning, Houghton Mifflin Harcourt, McGraw-Hill Education, Pearson Education, and Scholastic (Book Scouter, 2020). Within these companies, three of the five publishers had textbooks related to the agriculture, food, and natural resources: Cengage, Pearson, and McGraw-Hill. A total of 58 books were obtained from the publishers through a variety of options: loan book program from publisher; online view subscription, purchase, and publisher provided copy.

A scholar not associated with the study, but competent in the guiding theory and methodology, served as a reviewer. Random samples were drawn by the reviewer to maintain the integrity of the evaluation (Kisorio & Langley 2015; Miller, 1997; Lincoln & Guba, 1985). Every page of the textbook was reviewed and within each page, the researchers examined the photos, chapter information, tables, charts, figures, examples, review questions, and case studies. If a name was given within a case studies or review question, the researchers utilized a name search engine to determine the most common ethnicity and/or gender associated with the name. For photos where a face was not present, but a person's hands were a focal point, only race was captured. Focal points of photos were determined by a photo's caption or lack thereof. In instances without a caption, the person within the photo would need to be in at least two-thirds of the photo. In the presence of multiple individuals in the same photo, the researchers agreed on the following guidelines to secure inter- and intra-rater reliability: if at least one of each category was represented it would account for one instance of each category. When a photo was used multiple times throughout a textbook, only the first instance of the same photo would be considered. A reflective journal was maintained by the primary researcher to assist in describing images that either did not reflect the theme or a trend of marginalization was occurring. At the conclusion of the review, the researchers evaluated 34,161 pages, 4,603 photos, and 585 case studies.

The data was spread across two workbooks. One of the workbooks the textbooks were classified and separated into the following disciplines of agriculture: agricultural mechanics, animal science, business, horticulture, introduction to agriculture, agricultural science, natural resources/environment, food science, and veterinary science. In the second workbook, the textbooks were separated by their publisher.

The data were recorded on Microsoft Excel to determine frequencies and percentages. Chi-square Goodness of Fit evaluation determined differences and an online calculator assisted in the analysis. To conduct a goodness of fit, the researchers compare the observed value to the expected value (Sprinthall, 2007). In this study, the expected value was set based upon student enrollment in public schools as set by the National Center for Educational Statistics (2020). Such analysis was appropriate for the size and research objectives (Foster, 2021).

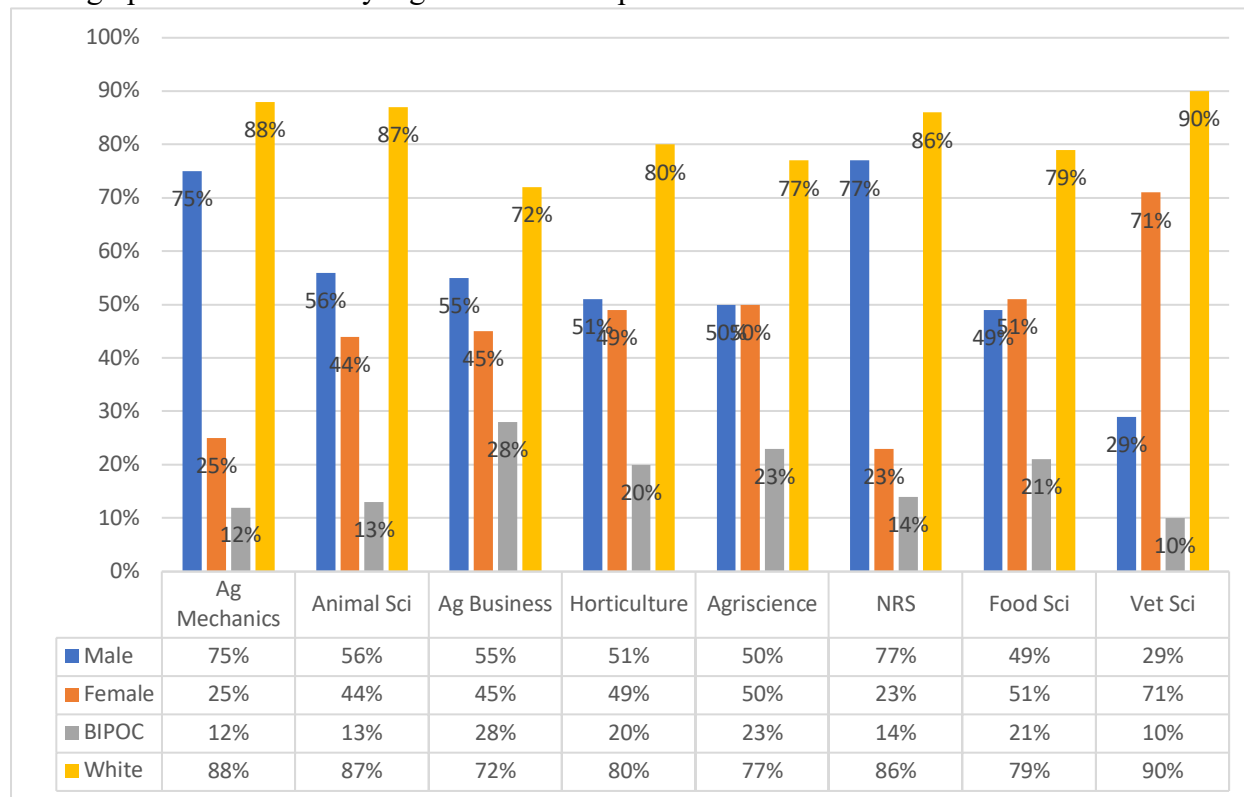
## **Results**

Across all the 58 textbooks gender representation was 52% ( $f = 2,796$ ) male and 48% ( $f = 2,622$ ) female. The racial composition for all textbooks were 19% BIPOC (black, indigenous, and people of color) ( $f = 1,297$ ) and 81% ( $f = 5,581$ ) white.

Research objective two sought to describe the demographics found by agriculture discipline (see Figure 1). Natural Resources had the highest presence of males ( $f = 106$ ; 77%), Veterinary

Medicine textbooks had the highest presence of females ( $f = 450$ ; 71%), and Veterinary Medicine textbooks had the highest presence of white individuals ( $f = 907$ ; 90%).

Figure 1.  
Demographic Breakdown by Agricultural Discipline



For each publisher demographics of ethnicity and gender representations, Cengage textbooks had 52% ( $f = 2,208$ ) male representation, 48% ( $f = 2,075$ ) female; 19% ( $f = 1,027$ ) BIPOC representation and 81% ( $f = 4,488$ ) white representation. Pearson reflected 52% ( $f = 571$ ) male representation and 48% ( $f = 537$ ) female and 20% ( $f = 262$ ) BIPOC and 80% ( $f = 1073$ ) white representation. McGraw-Hill agriculture textbook reflected 63% ( $f = 17$ ) male and 37% ( $f = 10$ ) female, and 29% ( $f = 8$ ) BIPOC and 71% ( $f = 20$ ) white.

There was a significant relationship in agricultural mechanics between textbook representation of females and public-school enrollment [ $X^2(1, 58) = 22.11, p = < .01$ ]. In addition, a significant relationship in Natural Resources between the lack of female representation and public-school enrollment [ $X^2(1,58) = 26.03, p = < .01$ ]. There was a significant relationship within the Veterinary Science textbooks between female representation and public-school enrollment [ $X^2(1,58) = 20.27, p = < .01$ ].

Overall, all the secondary agricultural education textbooks received a significant relationship between racial representation and public-school enrollment [ $X^2(1,58) = 46.41, p = < .01$ ]. To solve for Hypothesis 3 and 4, the researchers sought to determine the gender and racial differences by textbook publisher. Regarding Cengage textbooks, there was no significant relationship between gender in textbooks and the public-school enrollment [ $X^2(1,58) = .01, p =$

.92]. There was no significant relationship between gender in Pearson textbooks and the public-school enrollment [ $X^2(1,58) = .01, p = .92$ ]. Within the McGraw-Hill textbook, there was no significant relationship between gender in textbooks and the public-school enrollment [ $X^2(1,58) = 5.30, p = .02$ ]. There was a significant relationship in all three publishers and the racial composition present in each textbook. The textbooks had a significant presence of white individuals.

### **Conclusions, Implications, & Recommendations**

Agricultural mechanics, natural resources, and veterinary medicine have a significant difference between gender representation and public-school enrollment. While agricultural mechanics and natural resources have more males represented in the textbooks than public-school enrollment, veterinary medicine textbooks have more female present. These significant relationships present throughout agricultural education textbooks may impact students and their sense of belonging. The social semiotics present within the textbooks can provide subconscious messages for gender roles in particular professions. What one would expect to see represented in the textbooks, is seen. These semiotic references that youth see, create difficult sociological battles that teachers must overcome while striving for fair representation among all disciplines.

All the agricultural textbooks expose a significant gap in BIPOC representation as compared to the student enrollment in public schools. The overwhelming discrepancy in racial presence negatively impact feelings of belonging among BIPOC youth (Villegas et al., 2012). It is recommended that authors and publishers become more cognizant of the racial demographics present in the textbooks and the positioning of the images so that BIPOC individuals are a focal point or that names within examples and case studies reflect names of diverse racial groups.

Students of color currently in the secondary classrooms are not seeing themselves represented in textbooks at the same rate as their white peers. This lack of diversity and representation present in the textbooks is blatant and may send unintended messages to the students of color within agricultural education, even if there is no intention on excluding students of color. The overwhelming discrepancy in racial presence negatively impact feelings of belonging among BIPOC youth (Villegas et al., 2012). This lack of representation should be considered while choosing which textbooks would be best for the classroom, by textbooks authors, and by educational publishing companies.

Considering the limited studies regarding previous studies of textbooks and textbook demographics within secondary agricultural education, it is almost impossible to determine if these relationships between gender and racial representation have improved throughout the years of agricultural education textbooks production. However, considering trends of FFA membership demographics, it is important to note the organization is becoming more diverse than ever before. It is imperative for student resources to be inclusive and diverse to increase sense of belonging among minority both FFA members and secondary agricultural education students.

Further research is needed to address gender nonconformities, if any, are present in secondary agricultural textbooks. Research regarding textbook representation among specific ethnicities could explain what representation is present for specific racial minority groups. Observing colorism would give more insight on specifically the representation present in the textbooks.

Research regarding intersectionalities of individuals represented in the textbooks is recommended. Additionally, qualitative research considering student perception of textbook images could give perspectives about belonging within agricultural education.

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## **Casting a Critical Lens on Thailand's Higher Education System: A Case Study of Women's Experiences as Agricultural Extension Faculty**

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### **Introduction and Review of Literature**

Higher educational institutions have been shown to transform individuals and communities across the globe (Eboiyehi et al., 2016; Loots & Walker, 2015). For example, graduates who achieve a postsecondary degree can encourage economic growth, societal restructuring, and community cohesiveness (Lee, 2007). Further, a statically significant and positive relationship has been reported between baccalaureate degree completion and the development of a nation (Eboiyehi et al., 2016). As a result, the governments of developing economies have emphasized expanding access to higher education for their citizens in recent decades (Neubaur, 2019; Sakhiyya & Locke, 2019). This trend has been prevalent across Southeast Asia, especially in Thailand, where higher education has experienced extensive growth (Lee, 2007). Such growth coincided with expanded access for the region's disadvantaged and underrepresented groups (Morley, 2013). Historically, universities have been acknowledged as *highly gendered institutions* (Bird, 2011; Eboiyehi et al., 2016; Maranto & Griffin, 2011; Marchant & Wallace, 2013; Misra et al., 2012; Vu, 2018). Case in point, although a positive trend has existed regarding female's ability to obtain faculty positions, women remain marginalized in science, technology, engineering, and mathematics (STEM) fields in higher education (Christie et al., 2017; Cuthbert et al., 2019; Haeruddin, 2016; Howe-Walsh & Turnbull, 2016; Maheshwari & Nayak, 2020; Zaleniene et al., 2016). To complicate this further, previous evidence has demonstrated that higher education institutions' gender distribution among faculty has reflected a pyramid structure, i.e., more males hold leadership positions while women have been regulated to lower-level positions (Carrington & Pratt, 2003; Strachan et al., 2011; Vu, 2018).

This trend appears to extend across developed and developing regions of the world (Haeruddin, 2016; Howe-Walsh & Turnbull, 2016; Vu, 2018). For example, women have not been viewed positively in leadership roles in academia. In fact, in Southeast Asia, a statistically significant and negative relationship has been reported between higher education administrators' favorability and whether they identified as female (Mason & Smith, 2003; Morley, 2013; Sakhiyya & Locke, 2019). Mason and Smith (2003) noted that this issue was more prominent in developing countries, such as Thailand, where women in leadership roles have been rare.

On this point, Pimpa (2012) explained that this issue could be attributed to cultural norms and traditions in which women are viewed as primary caretakers and are typically responsible for domestic tasks. As a result, “women are given fewer opportunities and underrepresented at work in many Asian countries” (Maheshwari & Nayak, 2020, p. 3). Despite identifying these barriers, research on gendered issues in higher education institutions in developing nations have primarily focused on the participation rates of female students and their educational attainment (Francis et al., 2014; Phipps & Smith, 2012; Mama, 2006; Morley, 2006; Neale & Özkanli, 2010; Vaccaro, 2011). Consequently, Morley (2013) called for more attention to be placed on women faculty in Southeast Asia’s institutions of higher education, particularly in Thailand. A need emerged to gain a deeper understanding of how women in Thailand navigate their professional responsibilities as agricultural extension faculty despite pervasive gender inequalities in the country (Cuthbert et al., 2019; Haeruddin, 2016; Luke, 200a; Maheshwari & Nayak, 2020; Murniati, 2012; Neubauer, 2019; Toyibah, 2017; Zseleczky et al., 2013).

### **Philosophical Lens**

We examined women agricultural extension faculty’s experiences in Thailand through the lens of critical constructionism (Denzin & Lincoln, 2008). When using this lens, researchers position themselves “at the intersection of multiple epistemological and theoretical perspectives such as constructionism, social constructionism, and critical theory” (Richardson & Roberts, 2020, p. 10). Crotty (1998) advanced this approach to help social scientists analyze complex phenomena deeply influenced by power, privilege, and control issues. Using this lens allowed us to examine women’s experiences more critically in higher education. It also illuminated how the participants’ social realities have shaped power imbalances that have persisted in agriculture, extension, and women’s empowerment (Crotty, 1998).

### **Statement of Purpose**

This study examined the experiences of women agricultural extension faculty in Thailand. Two research questions guided this study: (1) What were participants’ experiences as women faculty in a historically male-dominated field in a developing country? and (2) What barriers did women agricultural extension faculty experience in higher education system?

### **Methodology**

To achieve the purpose, this investigation used an instrumental case study design (Stake, 1995). Research employing an instrumental case study approach helped “provide insight into an issue” (Baxter & Jack, 2008, p. 549). For that reason, this approach was appropriate for achieving an in-depth description of the phenomenon (Stake, 1995). In this study, the case was bounded by *place*, i.e., Thailand, and *participants’ occupation*, i.e., women agricultural extension faculty. Therefore, every participant in this study identified as female and a Thai national. It should be noted that we embedded Lincoln and Guba’s (1985) four standards of qualitative quality into the study’s design: To select participants, we used a combination of purposive and snowball sampling (Patton, 2002). To accomplish this, we identified women agricultural extension faculty from Thai universities with a Faculty of Agriculture, i.e., a College of Agriculture. After identifying individuals who met the study’s parameters, we recruited them through email. In

total, four individuals agreed to participate in a virtual interview. After accepting the invitation, participants were then provided a detailed description of the study and a consent form.

The primary source of data for this investigation was in-depth, semi-structured interviews conducted virtually using Zoom video conferencing software. In accordance with Creswell and Poth (2018), we developed a semi-structured interview protocol, which was approved by the [State] Institutional Review Board. The interview protocol included five major guiding questions that focused on (1) participants' background and experiences, (2) view of women's representation in the field, (3) perceptions of women serving in their position, (4) potential challenges and barriers experienced by the participant, and (5) the future of their field and the role that women will play. To triangulate findings, we also collected photographs and written reflections submitted by the participants. The photographs represented how participants perceived women in agriculture and the ways in which they viewed their role in higher education. However, due to the lack of space, the photographs were not featured in this abstract. After collecting data, we analyzed each source using analytic coding procedures advanced by Saldaña (2021). Coding is an approach that provides structure to the analysis process and insight by illuminating the data's underlying patterns. The use of coding helps qualitative researchers construct meaning from the data (Saldaña, 2021). To accomplish this, we used a two-cycle coding approach. The first cycle of coding involved two open coding techniques: (1) initial coding and (2) values coding (Saldaña, 2021). During this cycle, initial coding helped dismantle the data corpus into discrete and manageable parts (Saldaña, 2021; Corbin & Strauss, 2015). Initial coding has been referred to as *open coding* because of its open-ended approach to data analysis. The approach allowed us to consider provisional codes as the analytic process unfolded. Following initial coding, we used values coding to identify and understand the participants' values, beliefs, and attitudes regarding the phenomenon (Saldaña, 2021). Following the first coding cycle, we engaged in a second cycle of coding, which helped categorize the data and identify potential patterns and emergent themes. The second cycle coding technique used was pattern coding, which allowed us to reduce the codes from the first cycle into overarching themes (Saldaña, 2021). It should be mentioned that the data were analyzed using a critical constructionist lens (Denzin & Lincoln, 2008). As such, we sought to examine the mechanisms of power and related barriers influencing female faculty in Thailand's postsecondary agricultural extension programs.

## Findings

Our analysis of the data revealed three themes that depict women's perspectives on Thailand's higher education: (1) gendered disparities, (2) barriers to success in academia, (3) perceptions of self and gender in agriculture and higher education.

### Gendered Disparities

The first theme explored women agricultural extension faculty's experiences with societal gender inequalities. The emergence of this theme was likely because faculty were expected to extend their research and teaching into local communities through extension programs in Thailand. Despite expressing positive self-perceptions, the women also voiced a number of traditional gender stereotypes. To this point, the participants articulated how males were more

often promoted to leadership roles in higher education. Participant #2 stated: “[Thai] people accept more males than females.” She further explained: “I think for agriculture higher education, there were more males than females in the past, and now females have a [place] in this career...” Despite this, Participant #1 stated: “people [still] want to talk with males more than females [in higher education].” Participant #3 also discussed how in other areas of disciplines “like agricultural sales or engineering,” there was a greater preference to hire males rather than females. As a result, views that women were not qualified for positions in academia remained deeply entrenched in society.

On the other hand, Participant #4 articulated how she had observed women become more accepted in roles as agricultural extension faculty. For example, she observed greater participation in agricultural extension activities led by women in recent years. Further, more female participants were engaging in extension programming sponsored by her university. She explained: “Before, it is always a male come to join a group...but now I can say that a lot of women come [to my extension programs].” Participant #2 echoed a similar sentiment when she discussed her work with women’s groups and female cooperatives and how they “ask her, the expert, to teach them the [farming] techniques.” Another emergent concept was the female agricultural faculty’s role in influencing women’s empowerment by encouraging greater decision-making power. Participant #1 explained that, traditionally, women in Asian cultures “do all the housework” and that “the males rarely help.” Therefore, despite their increased responsibilities and decision-making power, the expectation that women assume that primary caretaker role remained.

### **Barriers to Success in Academia**

In the second theme, the women in this study expressed multiple barriers to their success as faculty. For example, because of expectations for women to fulfill feminine and domestic roles, they often received fewer work-related opportunities and experienced underrepresentation in their careers (Maheshwari & Nayak, 2020). On this point, participants explained how Thai women were primarily concerned with ensuring they devoted adequate time to their families. Because academic roles were often considered more flexible than other career fields, they perceived their careers promoted work-life balance. Nevertheless, Participant #2 discussed how placing more “emphasis on family” could also be viewed as a potential barrier to success for women faculty in Thailand because some administrators might view them as not prioritizing their work. Moreover, Participant #3 explained: “...the barrier is that I have to spare some time for taking care [of the family] and my work suffers.” Because the participants’ discussion of challenges in their careers often focused on balancing work and life, the cultural expectation for Thai women to remain the primary caretaker of their families emerged as a barrier.

The participants explored deeper contours regarding the barriers introduced by other individuals to their careers. For example, Participant #2 described how her friends and family were concerned about her career as an academic in agriculture. Further, the participants discussed how their friends and family viewed agriculture as hard, physical labor. When discussing her choice to study agriculture, Participant #4 explained, “my family did not want me to study agriculture because they think it is quite hard work.” In Asia, women have often been viewed as physically weaker, and careers involving hard labor and physically demanding tasks have been viewed as

undesirable (Richardson & Roberts, 2020). Participants also articulated how career progression and upward movement was a barrier for women in higher education. For example, all participants noted that women had been excluded from “top” or high-level positions. Participant #3 also noted that “males get promotion more than females” and “they prefer to select males.” Overall, the participants also reached a consensus that upper-level administration positions were still male-dominated. On this point, Participant #1 reported that there had only been “one female for the head department” at her university. Another participant shared a similar sentiment when she stated, “when it come [sic] to the highest rankings,” the university still prefers the position to be filled by males. However, in “lecturer [positions there] is a lot of female.”

### **Perceptions of Self and Gender in Agriculture and Higher Education**

Despite the perceived barriers to success experienced by women agricultural extension faculty, the participants in this investigation reported a distinctly positive perception of self and their abilities. For example, all participants reported that females were as capable as males in higher education. Moreover, Participant #2 stated: “females can do like a man do” and “we can do the same way as a male do.” Participant #1 maintained that “most females in this department...I mean, agronomy department females can do...can have [same] capability as a male.” The participants also reported that they had observed more women beginning to pursue agriculture as a career. Despite this, participants noted that women remained less represented in higher-level positions in academia. Beyond that, in multiple ways, the women of this study felt respected in their profession. Most of the women explained they were well regarded as lecturers and research scientists. “I think I get the respect from a student and from staff...we get respect from all,” said Participant #2. In Thailand, agriculture faculty were required to fulfill a multidimensional role that has historically included working with local farmers and the community through extension programming. When fulfilling this role, Participant #3 stated that she believed “[farmers] accept the mission of the woman” and that she has had “no problem with working with a group of farmers.”

### **Conclusions, Implications, and Recommendations**

This study explored the various ways in which women agricultural extension faculty in higher education positioned themselves in higher education by connecting their experiences and observations to prevalent gendered issues. Using a critical constructionist lens to analyze their experiences in agricultural higher education revealed each individual’s complex view of their unique experiences. Further, approaching the interpretation of the findings through a critical lens exposed the power imbalances in their profession (Crotty, 1998). Through this analysis, three themes surfaced: (1) gendered disparities, (2) barriers to success in academia, (3) perceptions of self and gender in agriculture and higher education. The emergence of these concepts offered a multifaceted glimpse into the women’s experiences and their storied perspectives.

The first theme provided an in-depth look at gendered disparities in Thailand and how they could impact women faculty. Through our analysis of the data, we concluded that Thailand’s agricultural sector remained a male-dominated field. Such a finding provided critical implications for women in higher education. For example, a combination of highly gendered institutions with a male-dominated agricultural industry appeared to provide significant barriers

for the women faculty in this investigation – a finding that aligned with previous research (Bird, 2011; Eboiyehi et al., 2016; Maranto & Griffin, 2011; Marchant & Wallace, 2013; Misra et al., 2012; Vu, 2018). The study's findings also suggested that women were slowly becoming more accepted in agricultural disciplines in higher education. We conclude, therefore, that although women have achieved more representation in Thailand's higher education, gender inequalities and barriers to women faculty's success have remained.

The second theme illuminated the barriers to success that women agricultural extension faculty in Thailand have experienced. The finding suggested that societal expectations regarding women's role in households presented a barrier to the success of participants in this investigation. For example, the women faculty discussed the importance of family and making career sacrifices to uphold their household responsibilities. This finding was consistent with Pimpa's (2012) work that reported how, in many Asian countries, cultural norms and traditions had placed women as primary caretakers of family units. As a result, women have historically had fewer career opportunities (Maheshwari & Nayak, 2020). The participants' discussions of family responsibilities suggested that this cultural perception had remained. Another barrier to success was the lack of female representation in upper-level positions in Thailand's higher education system, especially in agriculture. Although previous research had explored this phenomenon in academia more broadly (Luke, 2001; Meinzen-Dick et al., 2011; Neubauer, 2019), such has not been explicitly reported for women in agricultural extension. We conclude, therefore, that significant barriers have existed for women agricultural extension faculty in Thailand.

The final theme suggested that the participants had positive self-perceptions about their gender. In particular, the women faculty expressed that women were as capable as their male counterparts. Additionally, the participants reported they were respected by their students and farmers in rural communities that they engaged with during extension programming. We concluded, therefore, that although women in Thailand have continued to experience gender inequalities and barriers to career success rooted in cultural perceptions, they have positive perceptions of their experiences in their career and their position within it – a finding not currently reflected in the broader literature.

Morley (2013) reported that there had been an overall increase in women's presence as students and faculty at higher education institutions across the globe. However, findings from this investigation complicated such a notion. For example, although the participants perceived the number of female students and women obtaining faculty positions in agricultural disciplines had increased, these positive trends did not extend to upper-level academic positions, such as department heads, deans, and university presidents. The increased presence of women students and faculty should be viewed as a positive indicator of change; however, we recommend that future research explore why women have not been allowed to ascend to upper-level administrative positions. We also recommend that Thai university administrators create leadership development programs for women faculty to learn ways to successfully navigate academic culture and obtain administrative positions that could allow them to enact positive change.

Finally, we call for a deeper examination of Thai women's perceptions of self. For example, the participants in this investigation reported they felt respected and viewed positively by students and other stakeholders. Although such a finding indicated progress regarding gendered disparities, this could also lead to potential setbacks for women in the future. For example, Powell (2016) warned of the dangerousness of championing meritocracy in society for women. Meritocracy represents when individuals are valued for their performance and experience rather than "other considerations such as equality, need, rights, or seniority" (Powell, 2016, p. 29). Previous work has suggested that removing considerations of gender has had unintentional and even hidden discrimination for women when applying for jobs, promotions, and research funding (Morley & Crossouard, 2015; Powell, 2016). As a result, if Thai women continue not to recognize the need to advocate for greater gender equality in higher education, it could stymie women's progress in the future.

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