Poster Session Proceedings

Western Region Conference of the American Association for Agricultural Education
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One hundred and thirteen posters were received with 47 in the innovative idea category and 66 in the research category. Twenty-nine innovative posters were accepted (62% acceptance rate). Thirty posters were accepted for research (45% acceptance rate).

Poster Reviewers:
We wish to acknowledge the help of the following reviewers for generously and professionally donating their time. Without their commitment, the poster session would not be possible.

Name	Institution
Abrams, Katie	Colorado State University
Anderson, Ryan	Texas State University
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Doss, William	Texas Tech University
Easterly III, R. G. (Tre)	New Mexico State University
Eck, Christopher	Oklahoma State University
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Elliott-Engel, Jeremy	The University of Arizona
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Haddad, Becky	Oregon State University
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Hasselquist, Laura	South Dakota State University
Haynes, J. Chris	Tarleton State University
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Inman, Ruth	Oklahoma State University
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McCubbins, OP	Texas A&M University
McKim, Aaron	Michigan State University
Meyers, Courtney	Texas Tech University
Miller, Kimberley	California State Polytechnic University, Pomona
Murphrey, Theresa	Texas A&M University
Narine, Lendel	Utah State University
Rucker, Jill	University of Arkansas
Saucier, Ryan	Sam Houston State University
Seevers, Brenda	New Mexico State University
Sorensen, Tyson	Utah State University
Spiess, Michael	California State University, Chico
Steede, Garrett	University of Minnesota
Taylor, Lisa	University of Nevada, Reno
Terry, Rob	Oklahoma State University
Thiel, Brooke	North Dakota State University
Wagner, Sharon	Texas A&M University

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Innovative Idea Poster Abstracts

A College Collaboration: Connecting a College Communications Team with an Agricultural Communications Course to Create Content

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A College Collaboration: Connecting a College Communications Team with an Agricultural Communications Course to Create Content

Introduction / Need for Innovation

As videos have become more popular, people are turning to them as a form of visual news. Organizations and businesses have recognized this transition and have started to create and share their own videos regarding news, updates, and information to social media content sharing sites (Pew Research Center, 2014). Not surprisingly, public opinion on agriculture and natural resource issues have become more polarized, even though the public knows very little about agriculture and natural resources (Hamilton, 2004). In response, academic stakeholders often strategically partner up with other stakeholders to create collaborations to better disseminate their information and to better inform the public (Qu, Irani, & Lindsey, 2018).

Additionally, the 2016-2020 National Research Agenda for the American Association for Agricultural Education named "Public and Policy Maker Understanding of Agriculture and Natural Resources" as the number one research priority (Roberts, Harder, & Brashears, 2016). Roberts et al., 2016). This research priority touches on the idea that if U.S. agriculture is going to provide for an ever-growing population and is going to meet the needs of citizens, agriculture must be valued and understood by all (Roberts et al., 2016).

One of Oregon State University (OSU) agricultural communications instructors and students recognized this shift in video popularity and decided to integrate the creation of a video featuring the students in the course addressing common misunderstandings in agriculture. Video was not an area of communication that had previously been included in the curriculum. This is needed as more times than not, undergraduate students who are pursuing a career in agricultural communications are expected to be the "jack of all trades" and be trained in a variety of communication areas such as photography, writing, video, advocacy and more (Morgan, 2012). The opportunity to partner with communications staff in the College of Agricultural Sciences (CAS) to create a video advocating for agriculture came out of this recognition and need.

How it Works

After finishing lessons on industry advocacy, students enrolled in an agricultural communications course titled "Communicating Agriculture to the Public" created a list of common misunderstandings in agriculture they wanted to address. Students discussed how agriculturalists should talk to the lay public about common misconceptions regarding agriculture to help mitigate consumers' irrational fears and concerns when it came to different facets of the agriculture industry. Students also addressed the importance of coming across as sincere and relatable when discussing these misconceptions with the public.

As a class, the students decided the best way to reach the public and gain interest in listening to them debunk agriculture misconceptions was to create a two-minute video to be posted on social media. Students suggested having the video shared on the CAS Facebook page for better reach and dissemination. The course instructor reached out to the CAS communications team to see if they would be willing to assist with the videoing and editing of the project and proposed the collaboration as something the college could feature on their social media pages, as a way to highlight real students and to feature a student-driven project that was happening within the

academic college. Two communication team members who were trained in video production assisted in filming the students with a high quality video camera. The course instructor reserved one of the college's conference rooms for free for the video to take place in. The students each came up with their own script and answered what misunderstanding they wanted to address the most. The two team members filmed the students

Results to Date/Implications

The CAS posted the video to their Facebook page which has 4,334 likes and a following of 4,582 people. The same video was also shared on the OSU Department of Agricultural Education & Agricultural Sciences Facebook page, which is the academic department the course that created the video is taught in. The department's Facebook page has 473 likes and 485 followers. As of July 1st, 2019, the video posted on the college Facebook page had 4.7K views, 86 Facebook "likes" and 6 Facebook "love" reactions with 86 shares (College of Agricultural Sciences – Oregon State University, 2019). Extension county Facebook pages, agriculture organizations in neighboring states, state FFA chapters, donors of the college, other agricultural departments on campus, students featured in the video, and alumni of OSU reshared the video.

Students filled out an optional survey about partnering with the CAS communications team on the last day of class. Majority of students said they enjoyed having a platform provided for them to use their voice to advocate for the industry. They also noted they appreciated how high quality and professional the video turned out. Majority of the students also said they wanted to continue working with the team to produce more pro-agriculutre videos, photos, and other content. None of the students had any negative comments regarding partnering with the CAS team.

Future Plans/Advice to Others

Partnering with our college's communications team allowed for students to have a designated platform that had an existing following to advocate for agriculture. The team also enjoyed the opportunity to connect with students within the college they manage communications for and to highlight their work. The team also appreciated having content to showcase that they didn't necessarily have to gather or create by themselves. Teaming up with the CAS communications team allowed for our department's agricultural communications course get more exposure, which is crucial because OSU is starting a new ag communications program, which will be the first one in Oregon.

Agricultural communications courses should partner with their ag college's communications team to create a bridge between what is happening in the classroom to the outside world. Students enjoyed working with a professional communications team so they could focus more on their messaging and the communications team enjoyed being able to highlight students rather than their usual research spotlight of distinguished faculty. Future plans include partnering witht the team to create agricultural podcasts and student highlights.

Costs/Resources Needed

Partnering with the OSU CAS communications team alleviated video production costs which at OSU can cost anywhere between $2,000-$3,000 for a short video. In order to produce the video in a timely fashion, an outside student video editor was hired for $50 to compile the students' recordings together with cut transitions accompanied by music.

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Administrator Experience: Closing the Gap between School-Based Agricultural Education and Administration

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Administrator Experience: Closing the Gap between School-Based Agricultural Education and Administration

Introduction/Need for Innovation or Idea

The success of school-based agricultural education (SBAE) programs depends on an intricate web of relationships—none of which are more vital than the relationship between the agricultural educator and their administration. The American Association for Agricultural Education (AAAE) national research agenda seeks to find ways to support teachers in all phases of their career (Roberts, Harder, & Brashears, 2016), and administration plays a role in this support mechanism. Many SBAE teachers contribute a significant part of their job satisfaction to a supportive and understanding school administration (Rice, LaVergne, & Gartin, 2011). Smith and Myers (2012) reported the existence of an SBAE program is highly influenced by the principal's perceptions about the agriculture education program. Additionally, administrators are tasked with hiring the teachers of SBAE for their program. Without a complete understanding of all the facets of SBAE programming, it is very difficult to hire the best candidate to ensure a successful program.

Administration also plays a part in teacher retention. Many agricultural educators cite lack of administrative support and understanding as a significant reason why they chose to leave the profession (Boone & Boone, 2007; Castillo & Cano, 1999; Kelsey, 2006; Walker, Garton, & Kitchel, 2004). Rice et al. (2011) recommended, to improve SBAE teacher job satisfaction and retention, administrators need a better understanding of the teachers' role. A recent study analyzing agricultural teacher attrition reflected, "As several participants inferred their administrators did not understand agricultural education, a recommendation would be to develop a regional or state program for administrators to showcase opportunities and impact of agricultural education and FFA" (Solomonson, 2017, p. 66). To tackle this, the *Administrator Experience* was created as an event for administrators of schools with SBAE programs, held concurrently with the State FFA Leadership Conference. The importance of administrative understanding and appreciation of SBAE programs and roles of the teacher cannot be understated. The *Administrator Experience* serves as an opportunity to strengthen the relationship between SBAE and program administration on a local and state level.

How It Works/Methodology/Program Phases/Steps

This event was designed with four phases: 1) Planning, 2) Recruitment, 3) Implementation, and 4) Evaluation. Planning was conducted by a program director under a state professional development contract. This director solicited topics from members of the SBAE profession, created recruitment materials, and handled all room scheduling and conference logistics. As the event was held in conjunction with the State FFA Leadership Conference, communication with the Assistant State FFA Advisor was also crucial. The recruitment for the event was done via the California program listserv, which also has access to program administrator emails.

When implemented, the conference began mid-day on a Friday during the State FFA Leadership Conference and ended the following day at noon. The formal program consisted of various presentations with state leaders in agricultural education, state elected education officials, and specialists in agriculture pathway programming. Informal sessions included meals with agriculture program alumni and other agriculture teachers, attendance in State FFA Leadership

Conference sessions, and serving as proficiency award interview judges. A complete program of events will be provided with the poster. After the event, evaluation was performed in the form of an email survey soliciting feedback on the value of sessions and highlights for participants.

Results to date/implications

A pilot event, offered to administrators from the North Coast region during 2017, resulted in 14 participants. During the 2018 and 2019 years, the event was open statewide and served 43 administrators per year. Overall results of the event, as reported in most recent evaluations (N = 24), were favorable. When asked "How satisfied were you with the event overall?" Likert-scale ratings (1 = not satisfied and 5 = very satisfied) indicated a *Mode* of 5 (M = 4.58, SD = .50). There is room to improve in terms of relevancy, as when prompted, "How relevant and helpful do you think it was for your position and school?" the *Mode* was 4 (M = 4.2, SD = .58). A component of the *Administrator Experience* consistently marked "very relevant" on evaluations was the scoring of student proficiency award interviews. Additionally, when given the opportunity to identify key take-away moments from the conference, one participant said, "Supporting Ag teachers is important and understanding all that they do" while another responded "I never really thought about how much ag is part of our everyday lives and we need to recruit people to work in that field." The implications of the event have extended beyond sheer support of SBAE programs and serve as a catalyst for general support of agriculture as an industry by secondary administrators.

Future plans/advice to others

California will continue to offer the *Administrator Experience* as a complement to its State FFA Leadership Conference. The event provides opportunity for administrators to interact with other administrators in schools with SBAE programs, SBAE teachers, program alumni, and state agricultural education consultants. Additionally, administrators are able to witness their students participate in competitive events and see their leadership development.

Advice to other states includes capitalizing on what is already offered at existing State FFA Leadership Conferences. Engaging administrators in positive, immersive opportunities where they can be active participants rather than bystanders is necessary. Facilitating the interaction of administrators, students, and teachers from SBAE programs has served as a powerful mechanism for garnering support of local programs, agriculture, and agricultural education statewide.

Costs/resources needed

This project was facilitated by the program director of a statewide professional development contract serving SBAE in California. The program director charged a registration fee of $150 per administrator. This fee covered meals; one meal voucher for use with conference food vendors, one catered breakfast, and one boxed lunch. Guest speakers were those already in attendance at the conference and required no additional fees. The meeting room was in use by the FFA state conference and available at no additional charge. Audiovisual equipment was provided, at no cost, by the host institution of the program director. Additional resources needed would be access to SBAE alumni and teachers, already in attendance at the conference, for the catered breakfast event. Although the program director offered to cover hotel rooms for participants, no one took advantage of the offer. For the 2019 conference, which served 43 administrators, the total cost was $6,450, which was covered by the participant registration fees. The cost for the program director was absorbed by the statewide professional development contract.

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Building *ALL* Three-legs to the Teacher Retention Stool

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Building *ALL* Three-legs to the Teacher Retention Stool

Introduction

Teaching, like all careers, comes with its fair share of obstacles which may lead to challenges in teacher recruitment and retention. Constant turn-over in the school system is detrimental for students, the school, but the teaching community. The unique structure of School Based Agricultural Education presents agriculture teachers with additional responsibilities not required of teachers in other content areas (Greiman, Walker & Birkenholtz, 2005). Failure to succeed in mastering the classroom, FFA, Supervised Agricultural Experience (SAE) and other program management duties can contribute to teacher frustration and isolation (Boone & Boone, 2007). Lack of consistent teacher preparation may also contribute to the decision to leave the profession (Cole, 1984). In Colorado many of the areas of concern for new agriculture educators include classroom instruction, student management, agriculture mechanics instruction/management, FFA leadership activities, FFA fundraising and budgeting, working with administrators and the community, and keeping student records/grades (J. J. Stahley, personal communication, June 27, 2019). Challenges within these areas may have the most impact on a teacher's decision leave the profession.

Over 50 percent of the agriculture teachers in Colorado are in their first three years teaching. The leadership team, Colorado Team Ag Ed, approached the teacher retention issue with a robust, innovate response: The Local Teacher Success (LTS) program. The LTS program initiated three main support systems for new teachers: New Teacher Bootcamp (NTB), professional development focused on needs of new teachers, and an LTS Mentor. The LTS Mentor, a newly retired agriculture teacher, provides on-sight visitation to address the needs of the teacher, while also working with local administration and community members to support the new hire. Like a stool with three legs, if any one of these inputs is sacrificed, there is less likelihood of teacher retention.

LTS Program Phases/Steps

Much like the planning and building of a stool, the LTS program has similar steps: planning, building and evaluation. In the planning phase, Colorado Team Ag Ed meets and discusses priorities for the upcoming year utilizing data from previous years, both formal and anecdotal.

A list of professional development activities throughout the year are created, with specific detail and responsibilities assigned. At minimum, three state-wide professional development conferences are provided, based on the needs expressed or witnessed by Team Ag Ed; conferences may be regional, or state-wide meetings related to FFA, SAE and work-based learning, curriculum development or specific content training in pathways like agriculture mechanics. Professional development provided by Team Ag Ed, industry and experienced agriculture teachers to eliminate the perceived barriers of new teachers asking others for help. Additionally, the LTS Mentor offers specific “just in time” professional development using Zoom Meeting technology, offering procedural or informational assistance to new teachers bi-monthly.

In addition to the breadth of professional development offered, there is an intensive, week-long deep dive for new teachers, NTB, designed to provide an understanding of the processes and personnel in Colorado, specific due dates, and tips and tricks to make the first month of teaching

successful. Each member of Team Ag Ed participates in this event by helping to deliver content, coordinating housing, providing and cooking meals, and developing resources that teachers can take home.

After professional development planning is complete, funding resources were secured and the LTS personnel were hired. During NTB visit dates for all first-year teachers by the LTS mentor were established; first year teachers receive two on-site visits, second- and third-year teachers receive one with the option of additional should the local school district choose for additional support. Funding is secured for our program through the NAAE STAR Grant and private donations raised through the Colorado FFA Foundation, and post-secondary institutions.

Evaluation is done through quarterly face-to-face meetings of the LTS mentor and Colorado Team Ag Ed. During quarterly meetings the LTS Mentor reports out to the team, where priorities can be adjusted, and additional help can be provided, and the financial budget is reviewed.

Results to Date/Implications

From July 1, 2018 to June 30, 2019, there was significant impact from the LTS Program, including: over 40 teachers attended the NTB, 81 agricultural education program and new teacher visits were provided by LTS Mentor, traveling over 27,000 miles over 184 days. Many new teachers attended professional development offered throughout the academic year. There were 28 new teacher Zoom Meetings provided in the last year. The LTS program has shown significant improvements in teacher retention including: 93% of 1st year teachers signing their 2nd contract, 88% of 2nd year teachers signing their 3rd contract, 93% of 3rd year teachers signing their 4th contract.

Future/Advice to Others

There has been significant success in the LTS program, with exceptional service being provided to new teachers in Colorado. The significant distances traveled have been challenging to accomplish; therefore, there are plans to expand the LTS personnel in the upcoming year. The LTS program allowed all the state leadership to provide support in one of the ‘legs’ of the program (professional development, NTB); while a bulk of the program visits were provided by the LTS mentor. The Team Ag Ed acknowledges that these are visits that could not have occurred prior to this program and show significant service to new teachers. Prior to the LTS Mentor being hired, only two of the three ‘legs’ were provided to new teachers and retention continued to be an issue. The balancing of all three of the LTS program ‘legs’ allows for a more comprehensive retention plan.

Cost and Resources

There are significant costs to the LTS program. Currently the NTB costs $4000 for housing, meals and supplies. The salary for the New Teacher Mentor is $45,000 and $9,800 for lodging, meals and mileage for the program visits. Additional resources are provided for other professional development activities, including in-kind costs, but they are not specific to the LTS program alone.

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Connecting Research Stations to Area Agricultural Education Programs

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Connecting Research Stations to Area Agricultural Education Programs

Introduction/Need for Innovation

There are a shortage of agriculture graduates (CSREES, 2005) available to meet the estimated 5% increase in the number of annual job openings between 2015 and 2020 (Goecker, Smith, Fernandez, Ali, & Theller, 2015). USDA recognizes the need for a diverse agricultural workforce. "Diverse experiences, background and education are vital to a healthy agricultural sector that continues to meet the challenges of a changing world and the demands of markets at home and abroad" (USDA, 2016, para. 8). The National Academy of Sciences (NAS, 2009) specifically called for more purposeful connections between science and inquiry in agriculture to fill the critical need of future agricultural scientists.

Agriculture teachers have reported several obstacles when it comes to supporting students' research endeavors. Koehlmoos and Hock (2018) reported a lack of confidence and knowledge of the research process as reasons for teachers not incorporating research into their programs. Also mentioned as a lack of facilities and equipment and time to fit it into existing curriculum demands (Koehlmoos & Hock, 2018). In addition to classroom research projects, there has been limited engagement and participation in the FFA Agriscience Fair in Kansas, North Carolina, and Idaho. This event "recognizes student researchers studying the application of agricultural scientific principles and emerging technologies in agricultural enterprises" (2015, para. 1). When asked how to improve the Kansas FFA Agriscience Fair respondents mentioned the need for in-service training and support to increase student participation (Koehlmoos & Hock, 2018).

In an effort to increase the confidence and competence of agriculture teachers to support their students' research projects, collaboration and mentoring was established with local research station scientists through a grant funded USDA-NIFA project. This partnership is important because "a stronger relationship between and within youth, adults, and other community entities strengthens communities" (Graham, Arnold & Jayaratne, 2016, p. 50). The National Research Council (2009) also encouraged more collaborations and partnerships between universities and secondary students and teachers. Agriculture teachers need to be trained in strategies to use when teaching employability skills for future FANH scientists (Hughes & Barrick, 1993). Components of this specific training focused on content, linking previous knowledge to new concepts, and relationship building (Desimone, 2009).

How it Works/Methods/Steps

The first step in facilitating the cooperation between research stations/centers and area secondary agriculture programs/teachers was to identify all individuals willing to participate in the project. Work began by identifying the research stations in each state. In all three partner-states the project leads identified high school agricultural educators who were interested in connecting with local research stations to augment their instruction of research in their programs. Once teachers were identified, they were made aware of all state research stations, including the research focus of each, and were then connected to field and research staff at that site. Research center staff were also onboarded in various ways to build relationships and processes that facilitate the desired mentorship and engagement.

The training consisted of several key items: (a) introduction to the important role of regional research centers, (b) an introduction of the participants and partners and the role they play, (c) examples of research that is being conducted at the stations and the schools, (d) an overview of the Agriscience Fair and SAE connections, and (e) discussion of possible collaborations and needs of each participant. Time for discussion and idea generation was budgeted into the schedule and meetings generally lasted approximately 2 hours. Some of these meeting occurred in a face-to-face format while others occurred via video conferencing technology.

Results to Date/Implications

Ten teachers have been identified in each of the partner states. Twenty-eight of those teachers have completed the training and are now moving forward with the research collaborations outlined in the grant project. Eight research station scientists at five area research stations in Kansas participated in the initial training and collaboration meetings. Idaho has five research stations and six researchers who will continue working on the project. In North Carolina six research stations are involved including over 15 field staff and researchers. Teachers are including research stations in their opportunities for students to engage with SAE and the Agriscience Fair. We expect future participation and an increase in collaboration because of the relationships that have been built.

Future Plans/Advice to Others

The next step is to work with the students to get them ready to conduct the research. Trainings with the students have been scheduled or are already being conducted. Our goal is to increase the number and quality of agriscience projects competing in each state's FFA Agriscience Fair. To accomplish this, we will: (a) increase student interest in a career as a FANH scientist, (b) increase the number of students completing a FANH research project, (c) increase the quality and local relevance of student agriscience research projects, and (d) assess the effectiveness of our model of research center mentorship and engagement.

Collaboration between the university faculty members on this project allows for the creation of this innovative practice, mentoring guides, and communication tools. We would advise others to be purposeful in introducing your research center staff and researchers to your agricultural educators, be mindful of the research center time commitments, be flexible in allowing the relationships to grow organically, find creative ways to reduce the burden of mentorship on research center scientists and staff, and identify funding sources to support student research. Ultimately, the introduction of the researchers and SBAE teachers has been critical. We found all parties to have concerns, but also a willingness to engage.

Costs/Resources Needed

The funding for this innovation was provided by a USDA NIFA SPECA grant. The trainings in each state cost approximately $1,500 to conduct, with $900 spent on the training notebooks (25 total) and the remaining for university faculty lead travel. Each teacher was paid $500 for attending the initial training and agreeing to engage his or her students with the project. Research scientists were not paid for their involvement in the trainings. Therefore, it is crucial to find individuals who see the value in working with future generations of scientists.

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Crafting Precise Personas: An Application of Q Methodological Research

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Crafting Precise Personas: An Application of Q Methodological Research

Introduction/Need for Innovation

Adapting each message to a target audience will foster maximum communication efficiency because personalizing the message to the personal beliefs and opinions enhances the relevance of the subject (Hawkins & Fackrell, 2008). Persona development is a common strategy used to distinguish key stakeholder entities for marketing purposes. Personas are detailed archetypal characters that represent distinct groups of behaviors, goals, and motivations observed and identified through the research process (Guo & Ma, 2018). The completion of personas requires an insightful perspective into the psychographics of individuals. Market research conducted to inform personas, such as the administration of focus groups or the examination of online web browsing habits, is time-intensive and expensive (Dion & Arnould, 2015). Q methodology provides another technique to develop audience personas. Q methodology is a research approach grounded in the study of human subjectivity, a concept embodying how an individual's personal opinions and feelings shape one's judgements. At its core, the technique seeks to unveil patterns and viewpoints held by specific audiences (Watts & Stenner, 2012).

The rich descriptions detailing the priorities of participants grant this method as a promising avenue for communicators to accurately capture the inherent viewpoints of defined audience groups and build credible personas. Q methodology combines qualitative aspects of research in the examination of subjective human experiences and perspectives (Brown, 1993), but also integrates the quantitative tools of correlation and factor analysis to yield persona groupings (Simons, 2013). As agricultural communicators seek empirically rigorous methods to understand perceptions, Q methodology offers a means to "capture subjectivity – reliably, scientifically, and experimentally" (Watts & Stenner, 2012, p. 26). Q methodology's application to marketing and communications is a relatively novel endeavor, particularly in agricultural communications (Leggette & Redwine, 2016). To help others develop personas with empirical support, this poster provides insights gained from conducting Q methodology studies to develop precise personas.

How It Works/Methodology/Steps

In this research approach, data collection is comprised of a series of "Q sorts" in which participants physically rank statements printed on cards according to their level of agreement. These rankings are then analyzed to capture statistically similar groupings (Watts & Stenner, 2012). Researchers develop a comprehensive account of constructs encompassing the perceptions, beliefs of a topic known as the concourse. The statements should be broadly representative of the opinion domain and resist from exercising bias toward a particular viewpoint. Additionally, the concourse should embody diverse perspectives and be informed by qualitative methods or relevant literature (Watts & Stenner, 2012). Watts and Stenner (2012) recommended using a 40-80 statement Q set to enable adequate coverage and balance of the concept. In regard to the number of participants, Kline (1994) suggested a minimum ratio of two participants to every study variable, or twice as many Q set statements as participants. Pre-sort questionnaires and post-sort interviews are recommended to potentially add to the richness of the study, and "confirm and corroborate the tone of particular interpretations (p. 75). A unique number is attributed to each statement, and the ranking order data is recorded according to each column's distribution (Watts & Stenner, 2012.)

Data analysis is conducted using PQ Method Software, a package designed specifically for Q Methodology (Schmolk, 2014). Researchers first apply a Principal Component Analysis (PCA) to generate an unrotated factor matrix. The Kaiser-Guttman Criterion will serve as a guide to determine an appropriate factor extraction. All factors with an Eigenvalue greater than 1.0 are considered as defining sorts, following Watts and Stenner's (2012) recommendations to use values in determining workable and meaningful solutions. Lastly, a varimax rotation is applied to generate a rotated factor matrix and select defining sorts for a characterization of viewpoints.

Results To Date/Implications

One of the current authors has conducted two studies using Q methodology. One study was to better understand preferences of natural food retailer patrons (Smith, Elliot, & Redwine, 2018) while the other was an examination of cotton growers' perceptions about sustainable textile production. The data from these completed Q methodology studies were used to develop precise personas to represent various audience segments. The ability to develop personas truly reflective of key audience segments can inform strategic communication efforts and ensure messages are salient. The holistic viewpoint of an individual Q methodology helps discover acts as powerful information for agricultural communication practitioners to craft precisely accurate personas.

Future Plans/Advice To Others

The personas uncovered using Q sort can then be used to inform message development and testing endeavors. In regard to the results from the Q sort study with cotton farmers, we plan to use the personas to create and deliver targeted messaging that will influence changes in attitudes and behaviors related to sustainable textile production.

The design of a Q sort requires careful attention to the concourse, a fundamental component of the methodology, and steps should be taken to confirm the legitimacy of the statements. The concourse should be reviewed by subject matter experts to "clarify wording of items, reduce duplication, generate new items, and ensure that the Q set provides adequate coverage of the relevant ground" (Watts & Stenner, 2012, p. 61). Additionally, conducting a pilot test with participants similar to the study's target population serves as an important way to refine the wording of statements. Q methodology researchers have cautioned against using too many statements, which can make the sorting process overly demanding and taxing for participants (Curt, 1994). Scheduling adequate time for participants to thoughtfully complete the pre-sort questionnaire, conduct the Q sort, and engage in the post-sort interview is an important component to assuring the quality of data. While the time necessary is largely dependent on the concourse and individual, 20-30 minutes is recommended per participant.

Cost/Resources Needed

Q sorts can be conducted a number of ways, from arranging statements into the distribution on the floor to creating a board specifically for the purpose. A 2'x3' whiteboard with magnetized statements is a portable option that affords enough space for participants to complete the instrument. Some budget may be necessary to incentivize participants to thoughtfully participate in the study. The data analysis software designed specifically for Q methodology, PQ Method is free and available online.

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Crate it Away! Construction of a Wooden Crate in a Power Tool Skill Development Course

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Crate it Away! Construction of a Wooden Crate in a Power Tool Skill Development Course

Introduction/Need for Innovation or Idea

Psychomotor skill development is an important aspect in many agriculture pathways (Phipps, Osborne, Dyer, & Ball, 2008). The development of skills is often seen as a critical component of technical agriculture training as it leads to skills necessary in agriculture careers (Roberts & Ball, 2009). Psychomotor skills allow for concrete experiences (Shoulders & Myers, 2013), one of the four stages of Kolb's (1984) experiential learning model. Secondary agriculture teachers can reinforce student development in the operation and application of power tools by having students build a required project designed by the teacher (Hainline & Wells, 2019; Phipps, et al., 2008). Instructors at Colorado State University offer a course in power tool safety and management in which students learn the safe operation of tools found in a Power, Structure, and Technical Systems (PSTS) laboratory. There was a need to build a final project in this course to demonstrate cumulative learning and application of tools; the desire was also to find a final product which the students would take pride in building and want to take home following construction. The project needed to be cost effective to fit into the program budget and completed in a timely manner. With these items in mind, the instructor designed a wooden crate project in which students construct three wooden crates, one at a time, from 2"x6" stud lumber, high-density fiberboard (HDF), and 14-gauge steel.

How it Works/Methodology

Project building is taught in the power tool safety and management course for preservice agricultural education students. First, students are taught how to safely operate each tool in the PSTS laboratory. Second, they practice safe operation of the tools to develop the basic skill of operation. Third, students are given plans for the wood furniture crate final project. The set of plans includes scale drawings of the project, materials list, and an order of operations sheet.

The ends and sides of the crate are cut from one 8' 2"x6" piece of lumber and the bottom is cut from an 1/8" thick sheet of HDF. The side slats are fastened to the ends of the crate using metal brackets students design and fabricate themselves. During construction of the project, students use a total of 15 different power tools both portable and stationary. Portable tools include the use of the circular saw, jig saw, portable grinder, sander, drills (corded, cordless, and impact), router, and a pneumatic brad nailer. Stationary tools include the table saw, miter saw, metal band saw, drill press, bench grinder and iron worker. In addition, students design their own metal bracket hardware from 14-gauge steel. They use drafting software on their computers to design the bracket and transfer the files to a G coding software and cut the brackets using a CNC plasma cutting table. For this project to be utilized, three items are necessary for efficient completion: layout of the lab, efficient order of operations, and duplication of the project.

All tools, portable and stationary, have a set location in the lab (i.e. circular saws for cutting HDF are on one bench, drills for pocket screw holes on a separate bench, router on its own bench, etc.). Students move from station to station depending on the task they need to complete. This helps the instructor know what stage each student is at in the construction process, eliminates students standing in one spot "waiting" for a random tool, and helps to reinforce the

application of using the correct tool to complete a specific job. The project is small enough that students can carry parts to the different locations with little trouble. Additionally, the order of operations list is first divided into three initial sections: cutting the 2x6 to length, cutting the HDF bottom, and designing and cutting the bracket hardware. The class is also divided into three different groups. Each group begins work on a different section of the project. As each of these sections requires the use of different tools, the class is spread out across the different tool stations in the lab. This strategy helps to eliminate student down time as they are not all waiting for one specific tool to start the project. Once a student completes all the tasks in their assigned section, they move to the next section assigned in rotation order until they have completed all three sections. Once all three are completed students move onto the fourth section, which is to assemble the final project. Once the first crate is completed, they start on a second crate, following the same order of operation as they did before.

Results to Date/Implications

Though the project is not large, it is challenging and allows for significant skill duplication. After construction of the first crate, students completed the other crates at a much faster rate and to a higher quality. They were able to apply what they learned during the first try to improve on their performance. Additionally, utilizing stud construction grade lumber was first purchased as a cost saving measure, the rough raw material forced students to use different problem-solving strategies during constructing to ensure the final product is still of high quality. The project also provides an opportunity for instructors to model effective laboratory teaching strategies which limit "bottlenecking" at tool stations, limiting student downtime and keeping them on task in the lab. By breaking the class into three groups and having them start the project at different points and having the laboratory set up in stations, students experience how effective planning and preparation will help enhance the learning in project construction activities. Finally, multiple former students have indicated the usefulness of the project when they leave, having sent pictures of them being used as furniture.

Future Plans/Advice to Others

Modifications to the project are ongoing. As students encounter different challenges or have different ideas, we will continue to make modifications. If looking to replicate this project, know that 15 tools and the plasma table are not essential to construct this project, it can be adapted to fit whatever tools are available in any PSTS laboratory. Laboratory layout for efficient movement of students however is essential.

Costs/Resources Needed

Costs for the project are minimal, each crate requires one piece of stud lumber, HDF cut from a 4'x8' sheet and brackets cut from a 4'x8' sheet of steel. Other materials include screws and brad nails needed for assembly. The completed project has a total cost of $9.00 per crate or $27.00 for all three. A few consumables such as sandpaper, grinder flap discs, saw blades, etc. are needed, however, they are used for multiple students and in multiple classes so the per project cost of them is minimal. All costs are offset through a student paid course fee upon registering for the course.

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Creating an Online, General Education Agriculture Course for the University of California

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Creating an Online, General Education Agriculture Course for the University of California

Introduction/need for innovation or idea

Most consumers have little understanding of the path that their food takes from farm to fork, or of the science and technology that support and protect this path. Lack of agricultural literacy was recognized and analyzed in a 1988 report published by the National Research Council. Their report explains agricultural literacy as education about the importance of agriculture that equips citizens to understand and support policies beneficial to agriculture. The report encouraged organized agricultural education be included in curriculum in grades K-12 (NRC, 1988). Education programs and studies have focused primarily on elementary school-aged students, leading to possible omission of older learners who could be more immediately involved in choices influencing agricultural direction and policy (Kovar & Ball, 2013). Studies have demonstrated a lack of agricultural literacy among college-age students. At a university in central Texas, the overall mean score achieved by 501 freshmen who completed an assessment of agricultural literacy was 50.4% (Colbath & Morrish, 2010). In a study consisting of 500 freshmen at Oklahoma State University, the students obtained an overall mean score of 56% on an abbreviated agricultural literacy assessment (Dale, Robinson, & Edwards, 2017).

There is a critical need for college students, as current and future consumers, to have informed perspectives to evaluate what they see in the media, make well-reasoned choices, and understand potential consequences. Agricultural topics are often in the news, and higher levels of agricultural literacy can impact how individuals perceive that information. Students from a large public university who self-reported higher levels of agricultural literacy had more positive reactions to images taken from a broadcast news story about antibiotic use in livestock (Specht, McKim, & Rutherford, 2014). Given the demonstrated lack of agricultural literacy among college freshmen, it is crucial that widely accessible general education courses about food and agriculture be available and encouraged. One highly effective way to make these courses more accessible is through online course delivery. Online courses can expand learning opportunities by helping to overcome time and distance barriers to class accessibility, especially when educational resources are shared via cooperation between multiple universities (Centner, 2014).

It is within the context of increased need for widely accessible, college-level, agriculture-related courses that the University of California, Davis (UCD) course Science and Society 2V (SAS 2V): *Feeding the World: Influences on the Global Food Supply* was conceived. This is a general education, lower-division, fully online course about the science, mechanisms, challenges, trade-offs, and impacts of agriculture. SAS 2V was selected as the UCD campus contribution to the food curriculum within the University of California Office of the President's (UCOP) Global Food Initiative (GFI). The goal of the UCOP GFI is to raise awareness across the UC system of the science and societal impacts of food production, challenges to agricultural sustainability, and the importance of informed food choices. Development and delivery of SAS 2V has been jointly funded by the Innovative Learning Technology Initiative (ILTI) and the GFI of the UCOP. This fully-online class is widely available and accessible not only to UC Davis students, but also to students throughout the UC system. Via the cross-campus enrollment system, students from 9 other UC campuses throughout the state can enroll and take the course for credit.

How it works/methodology/program phases/steps

SAS 2V is administered in a blended learning format with both asynchronous and synchronous delivery of material. Each week students are required to view approximately 2

hours of archived video lectures as well as participate in a 50-minute, instructor-led live webinar. The video lectures are multiple short video clips (approximately 3-5) about a specific topic. Students complete 1-2 topics per week. The video clips consist of instructor voiceover of PowerPoint slides containing graphics, animations, and video to enhance the presented material. Each video clip is limited to approximately 5-20 minutes to maximize student focus and attention. The 10-week quarter includes a range of topics such as: Agriculture's Evolution and Revolution, Population and Food, Farming Systems and Sustainability, Farm Energy Balance, Adverse Consequences of Farming, Climate Change and Agriculture, Human Nutrition, Food Safety, Agricultural Economics Basics, and International Agriculture.

The weekly webinars serve as important points of interaction between the instructors and students. The webinars begin with introductory Ag Trivia as a fun test of students' general knowledge about agriculture and food. This is followed by a discussion of the "Muddy Points Topics List" composed of students' questions about the material. Next is a review of the week's topics where the instructors pose questions to the students. The webinar concludes with an "Agri-fact or Agri-fiction" discussion activity such as a debate about opposing views of a current news article about agriculture. Learning is assessed via weekly online quizzes consisting of multiple choice and true-false questions, 2 short writing assignments about class topics, and a cumulative final exam administered via the online proctoring service ProctorU.

The course website (developed on Canvas by Instructure) serves as the delivery vehicle and roadmap for the course. The website is organized into weekly modules, each containing the lecture videos for the week's topics, supplemental readings, a link to the webinar, and the quiz.

Results to date/implications

SAS 2V was first offered for student enrollment locally at UCD in the fall quarter of 2018 with 66 students enrolled. It was subsequently offered for enrollment of students at UCD as well as other UC campuses in winter and spring quarters of 2019. Enrollment increased each quarter with 85 students in winter and 129 students in spring. The ever-growing enrollment numbers attest to student interest and satisfaction with the course. Organization of the course website into systematic, easy-to-follow, weekly modules proved highly effective. Student questions about course structure or navigation were minimal, and student completion of assignments and tasks was nearly 100% every quarter.

Future Plans/advice to others

SAS 2V will be offered for UCD and UC system-wide enrollment during fall, winter and spring quarters of the 2019-2020 academic year. Future offerings will be dependent on available funding opportunities for instruction, administration, and updating/revision of the course. Increasing enrollment of students from the different UC campuses is an ongoing goal. Advice and assistance from academic technology specialists is crucial to creating a successful course.

Costs/resources needed

The largest infusion of resources for development of SAS 2V was required upfront for generating the pre-recorded video lecture content. Creating PowerPoint slides, writing scripts for instructor narration, and recording and editing the videos was the most resource-intensive component. Constructing a well-structured website for course delivery required significant time and revision. Expenditures were primarily for equipment such as video editing software, high quality microphones, and creator/instructor salaries.

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Dialing in on new communication research technology: Exploring opportunities for continuous response measurement in agricultural communications

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Dialing in on new communication research technology: Exploring opportunities for continuous response measurement in agricultural communications

Introduction / Need for Innovation

The dynamic nature of communication leads individuals to continuously change cognitive states as they understand and react to media messages (Biocca, David, & West, 1994). From a perspective of measurement, Maurer and Reinemann (2009) argued stand-alone, post-stimulus questionnaires "seldom lead to valid results about the causes of respondent's opinions and opinion changes" (p. 2). However, analyzing responses from moment-to-moment measures allows researchers to gain insights on individual preferences as the component unfolds and is experienced (Ramanathan & McGill, 2007).

Continuous Response Management (CRM) is a method used to track real-time, concurrent, individual consumer responses to media messages. It is a unique measure in the sense that it helps reveal critical moments that impact a participant's perception or sentiment about an experience in real-time (Izenson, 2016). From a data analysis standpoint, CRM allows researchers to examine reactions to key moments or content elements within a stimulus to continuously measure the believability of communication messages (Biocca et al., 1994), helping to mitigate one of the biggest problems in communications research – flawed recall and memory bias (Izenson, 2016). Goodwin, Chiarelli, and Irani (2011) argued much can be gained from understanding what specific messages consumers find favorable and unfavorable, what factors make them favorable or unfavorable, and what they want to hear and see in messages. CRM research holds the potential to help communication and marketing professionals in the agricultural industry understand what messages resonate with consumers.

How it Works

CRM tracks moment-to-moment responses from participants. It is employed using a remote control-like device that individuals use to continuously evaluate media content (Weaver, Huck, & Brosius, 2009) and is easily integrated into experimental studies (Keppel, 1982). Software packages, such as Perception Analyzer, allow the researcher to set up the test, collect and analyze data. Participants are provided and trained with an input device and asked to adjust the device to report their responses to the stimuli. Many CRM systems' input devices allow the participant to report indifference by placing their dial at a midpoint (Biocca et al., 1994). Oftentimes, the dial or keypad input devices are hand-held. CRM systems can be lab or field-based.

Participant responses are recorded wirelessly and converted to visual graphs and quantitative data stored on a computer (Weaver et al., 2009). Analysis of the hand-dial data allows the researcher to pinpoint reactions with specific moments during the message. This creates an opportunity for the researcher to compare and connect CRM responses to singular verbal or visual elements within the stimulus. Data can be visually analyzed through a series of means, or by analyzing the peaks and troughs (Biocca et al., 1994; Cummins, Smith, Callison, & Mukhtar, 2018; Izenson, 2016).

Results to Date/Implications

In the agricultural communications discipline specifically, two CRM studies have been conducted. Tarpley (2017) used CRM to determine the comfort ratings of consumers as they

viewed videos regarding the slaughter of livestock. In another study, LaGrande (2018) used CRM to measure levels of trust in different agricultural messages within a pro-agriculture video. Extension has also been a focus of CRM studies. Cummins et al. (2018) utilized CRM to identify different what visual elements extension agents preferred when learning about mitigating greenhouse gas emissions.

The two agricultural communications studies were built upon cross-disciplinary relationships between faculty members and students. Before beginning their studies, the graduate student researchers enrolled in an introductory research communication technology course offered by the College of Media and Communications at Texas Tech University. CRM experts in the College of Media and Communications provided instruction on how to use the CRM technology and software, in addition to their dial-testing lab on campus and assisted the agricultural communications students throughout their research studies.

Future Plans/Advice to Others

Students at Texas Tech University will continue to be encouraged to take courses outside of agricultural communications that focus on CRM and other unique research tools. CRM provides opportunity to not only analyze qualities of media messages, but can also be used to evaluate live presentations, speakers, and speeches (Maurer & Reinemann, 2009), which may serve as an evaluation method to be used in agricultural education and instruction. CRM studies could also help to address the questions associated with the American Association for Agricultural Education's priority area aimed at finding effective methods, models and programs to inform public opinion about agriculture and natural resources (Roberts, Harder, & Brashears, 2016). However, CRM is limited to measuring only one construct or dimension at a time. Therefore, potential CRM studies must be focused and precise. As CRM studies are considered, researchers should keep in mind this limitation, and exercise caution in crafting research objectives.

For those who want to use this research methodology, we recommend seeking research partners on your campus who may already have this equipment available. Partnering would also help offset costs associated with conducting CRM research and create research collaboration opportunities. Future CRM studies are encouraged because this method provides a potential solution to measure effectiveness and persuasiveness of agricultural messages. Researchers and practitioners are encouraged to use CRM to test messages as they are developed and use the results to create more effective messaging. Lastly, to better understand CRM data, it can be insightful to collect descriptive and qualitative data via survey instruments administered directly to participants after the CRM test.

Costs/Resources Needed

It is possible CRM's lack of prevalence in social science is due to the costs associated with the tools needed (Maurer & Reinemann, 2009). The Perception Analyzer software ranges in cost depending on the edition and number of dials desired. The most basic package, which contains 30 wireless dials, and one software license currently costs approximately $17,000. An additional expense involves training fees, which between $2,500 and $3,500. Partnering with research units that already have the equipment and expertise would be a less expensive option although they may charge to use their facilities.

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Poster Type: Innovative Idea

Elevating Ag Education: A Professional Development Program in Ecuador for Teachers

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Elevating Ag Education: A Professional Development Program in Ecuador for Teachers

Introduction and Need for Idea

The National Association of Agricultural Educators has communicated the need to deepen pedagogical and technical skills among teachers (NAAE, 2016). Furthermore, the national research agenda of the American Association for Agricultural Education (Roberts, Harder, & Brashears, 2016) addresses the question "what methods, models, and programs are effective in preparing people to work in a global agriculture and natural resource workforce?" (p. 31). One innovative method and program that we have developed to address these needs is to provide in-service teachers with a short-term high-impact international experience called *Elevate Ag Education*. Traditionally, study abroad programs are designed for college students as part of their degree programs. Teachers rarely get an opportunity for professional development involving study abroad that is discipline specific. In addition, teachers, particularly those in the mid-career phase, tend to settle in comfortable and predictable patterns of teaching and sometimes burn out if not invigorated with motivating experiences (White, Bloomfield, & Cornu 2010). The *Elevate Ag Education* program can rejuvenate in-service agriculture teachers' careers by providing them with challenging, immersive, and discipline specific professional development abroad that few have ever had a chance to do in their lifetime (Dwyer, 2004). Today's world is becoming increasingly interconnected (Lamm & Harder, 2010) and one of the purposes of this unique study abroad experience was to give teachers a cultural experience that connected to global agricultural concepts and issues. Ecuador was chosen as the study abroad site to give teachers an experience that enhanced their knowledge of global agriculture and the complex issues associated with it. It also provided the opportunity for teachers to experience what it is like to be a learner with a language barrier, to enhance the cultural and linguistic features of a teacher's tool box, and to develop intercultural and global awareness (Chieffo & Griffiths, 2004).

How it Works

Teachers from Utah, California, and Oregon were invited to participate in the 10-day *Elevate Ag Education* program in Ecuador. Teacher educators from California and Utah (program directors) worked with a third party called Experience International to develop the program and the itinerary. Experience International focusses on agricultural tours and exchange programs abroad and has extensive agricultural and natural resources education experience and connections in Ecuador (Experience International, 2019). The program directors worked collaboratively to recruit teachers nine months before the experience. During the months leading up to the experience, the program directors worked with the teachers for pre-trip training, dissemination of information, and to establish university or continuing education credit for participants. Program directors also work closely with Experience International to purposefully develop an itinerary that met the needs of teachers, exposed them to new cultural and agricultural opportunities, and provided them an opportunity to travel across Ecuador, visiting and exploring issues and a large breadth of agricultural enterprises from high in the Andes Mountains to the Amazon Basin. Experience International worked closely with in-country contacts to arrange all in-country accommodations (e.g., lodging, transportation, meals, etc.). Some of the tours included a dairy and milk processing plant, organic farm high in the mountains, flower farm and processing facility, sugar cane farm and processor, and a cacao farm and processing plant in the Amazon Basin. On each tour, participants learned about technical agriculture and natural resources management but also analyzed topics of sustainability, social justice, foreign aid and economics,

food safety, and food security. For one night, teachers lodged at a host family's house. Teachers completed reflection journals, engaged in frequent discussions, and developed lesson plans. To improve the trip for the future, program directors collected data and feedback from participants. The timetable for planning and executing this program was as follows: a) commitment from teachers with initial deposit by Dec 15; b) full amount due by Mar 1 for the program fee paid to Experience International to cover all in-country accommodations; c) teachers book and pay for flights by April 1; and d) *Elevate Ag Education* experience, July 7-17, 2018.

Results to Date and Implications

In total, 20 people engaged in the experience in some capacity: 14 in-service teachers, one graduate student, one undergraduate student, two teacher educators (program directors), and two in-country hosts (local guide and Experience International). Every teacher involved in the study abroad experience found the trip to be beneficial, felt that they gained an awareness of other cultures and empathy for underrepresented learners, experienced a change in comfort in a new culture, experienced a change in their knowledge of topics related to social and cultural justice, natural resources, food safety, foreign aid, and sustainability, and gained technical content knowledge of agriculture and agricultural issues. For example, from an exit survey, on a 5-point scale, teachers averaged between 4.21 and 4.36 regarding their agreement of gains in each of the above areas. Teachers involved in the trip have since continued communication with the schools in Ecuador to develop an exchange of information. Overall feedback and results of this global experience indicate it was very impactful. Furthermore, participating in-service teachers stated that undergraduates and graduate students who participated added to the overall experience.

Future Plans and Advice to Others

Future plans include expanding the program to occur every other year, seeking out study abroad opportunities in other countries, and recruiting more in-service and pre-service teachers. An additional observation that may increase enrollment numbers is to seek out funding opportunities to lower the overall cost of the trip. Additionally, it is recommended that those using this innovative approach to professional development partner with a third party, such as Experience International. Having the third party resource was crucial in the success of the trip because they were familiar with the country, they had the ability to connect with farmers and families, and they knew, based on past experiences, areas of the country the teachers should experience. Additionally, it is recommended that graduate and continuing education credits be offered to further advance teachers through promotion and tenure opportunities.

Resources Needed and Costs

To successfully plan and execute a study abroad opportunity for teachers many resources were needed, but most important was the third-party contact (Experience International). The program cost for each participant was $2,200. The program fee covered all in-country accommodations (e.g., lodging, food, transportation, etc.). In addition to the flat rate program cost, participants purchased round-trip plane tickets (~ $1,000), and some in-country miscellaneous items (e.g., souvenirs, optional meals/snacks, etc.). Some participants paid for and earned graduate school credit (3 credits) while others opted to pay for and receive Continuing Education credits from the respective state universities involved in this program. The optimal number of participants for cost and logistical purposes is about 25 as it keeps the charter bus comfortable (but filled) and allows feasibility in moving through facilities at tour locations.

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Evaluation Schematic for Agricultural Literacy Programming

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Evaluation Schematic for Agricultural Literacy Programming

Introduction and Need for the Idea

Enns, Martin, & Spielmaker (2016) report the need to develop a systematic approach to conducting agricultural literacy evaluation. While agricultural literacy programming is often extensive, the evaluation of such programs is limited; providing little evidence to the programmers for their justification. Due to the variability of programs a tool to determine the viable method of program evaluation is necessary. This need originates from various conditions typical of agricultural literacy programming, including the variability of program outcomes and program duration. The wide range of programmatic conditions can make identifying the appropriate evaluation tool a challenge. We developed this evaluation schematic for agricultural literacy students to help alleviate this challenge.

How It Works

Figure 1 depicts the evaluation schematic for agricultural literacy programming, which would be distributed along with examples of each tool and instructions on how to use each tool in agricultural literacy programming.

Engagement	Example(s)	Possible Outcome(s)	Evaluation Tool(s)
Day-long formal learning events (no more than 4–6 hours)	- Single-topic workshop - Certification program - One-time workshop	- Skill development - Affective domain - Knowledge domain	1. Participant post questionnaires 2. Instructor evaluation(s) 3. Participant evaluation(s) 4. Participant interview(s) 5. Instructor interview(s)
Guest speaker or panel of experts		- Knowledge domain - Agricultural awareness	1. Participant evaluation(s)
Booth at a community event	- County/state fair - Farmers' market	- Agricultural awareness	1. Passerby questionnaire(s)
Developing curriculum resources	- Lessons - Flier/reader - Expert bulletin	- Knowledge domain - Agricultural awareness	1. Participant pre/post questionnaire(s) 2. Curriculum facilitator evaluation(s) 3. Online Analytics (web-based resources)
Multi-day, formal learning events (over 6 hours)	- Service learning - After-school event - Complex topic workshop - Multi-day workshop	- Skill development - Affective domain - Knowledge domain - Agricultural awareness - Community development	1. Participant pre/post questionnaire(s) 2. Instructor evaluation(s) 3. Participant evaluation(s) 4. Participant interview(s) 5. Instructor interview(s) 6. Participant focus group

Figure 1. Evaluation Schematic for Agricultural Literacy Programming

We categorized each engagement primarily by duration, with some emphasis on intent. For example, there is a significant difference of time invested in each participant by an instructor positioned at a community booth versus at a multi-day, formal learning event. Furthermore, we wanted to distinguish the intent of engagement beyond formal instruction, including bringing in a guest speaker or forming a panel of experts as well as developing curriculum resources for another instructor's use. The five types of engagement events in this schematic offer varying opportunities for evaluation.

We further categorized engagement by possible intended outcomes, including skill development, knowledge domain, community development, agricultural awareness, and affective domain. We recognize that other categories of outcomes from agricultural literacy engagement are possible. We also recognize that one could anchor this schematic by intended outcome (rather than by type of engagement). We chose to focus on engagement type because our students generally approach agricultural literacy programming from this perspective.

Finally, we defined a questionnaire as an instrument that measures participants' knowledge, perceptions, and/or behaviors and could be administered either before or after an event. We defined an evaluation as a tool for examining program/instructional effectiveness that could be given to either the participants or instructors, typically after an event.

Results to Date

The undergraduate students in the Program Design and Evaluation class have responded positively to this schematic and subsequent instruction. Students have asked that more time be spent on evaluation in the course; instructional time on this unit has increased from 4 to 12 hours.

Future Plans and Advise

Moving forward, we plan to develop the schematic further by creating more examples, working with agricultural literacy practitioners to improve its viability, and continuing to share it with agricultural literacy students and practitioners.

Cost and Resources Needed

There are no costs to develop and share this evaluation schematic beyond a small commitment of time and instruction.

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Eye Can See Clearly Now: Applications of Eye-Tracking Technology in Agricultural Communications Research

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Introduction/Need for Innovation

Visual attention is a powerful indicator for understanding how individuals consume media sources (Wedel & Pieters, 2008). Through the use of eye-tracking technology, researchers can collect information on a viewer's attentive behavior (Duchowski, 2017). Eye-tracking in agricultural communications can be used to measure attention, recall, and information retention related to agricultural messages in different forms of media (Leggette, Rice, Carraway, Baker, & Conner, 2018). Leggette et al. (2018) found a lack of published eye-tracking research in agricultural communications, recommending the discipline explore how the technology can be used in research designs. As agricultural communicators rely on a variety of media inputs to connect with the public, it is important to understand how the public interacts with those sources. Nearly any type of visual media can be used in eye-tracking research, a feature which will benefit the design of engaging messages that capture consumers' attention.

How It Works/Methodology/Steps

To conduct the eye-tracking experiment, participants are instructed to sit in front of a computer monitor. Participants should have normal or corrected-to-normal vision and can wear glasses throughout the process. Once seated, the eye-tracking hardware and software must be calibrated, a process typically achieved by having the participant follow a moving dot with their eyes, which enables the eye-tracker to measure the precise path of eye movement. After calibration, participants view the stimuli according to the study's design. Eye-tracking allows for a variety of media to be used including pictures, videos, text, and websites. The participant can be given a set amount of time to view the stimuli or may be allowed to click through content at their own pace. External to the eye-tracking solution, survey instruments can be incorporated into the study design before and/or after viewing the stimuli to provide researchers an even deeper understanding of the data. Traditional metrics include fixation, number of fixations, scanpath, and areas of interests (Duchowski, 2017). Fixations are a metric tabulated by the software when the eye briefly pauses and lingers on an object. Number of fixations, which describe the quantity of fixations allocated toward a specific object, is a measurement generally understood to reflect the level of cognitive processing (Duchowski, 2017). Areas of interest are specific zones the researcher delineates to characterize a construct within the provided stimuli, and the eye movements between these targeted regions are regarded as scanpaths (Duchowski, 2017).

Results to Date/Implications

While there is a documented gap of eye-tracking research in agricultural communications, the methodology is gaining ground across the discipline. Recently several universities have conducted studies using the technology (including the current authors). Eye-tracking has been used several times to measure how agricultural magazine advertisements are received by the public. The technology has been used to determine how consumers interact with non-GMO labels in magazine advertisements (Metzger, 2018). One study measured motivational salience on pre-existing characteristics toward genetic modification and antibiotic use in livestock (Fischer, 2017). Another study examined how agricultural communications students viewed print advertisements before and after an introductory graphic design course (Lierle, 2017). Each of these studies focused on how people perceive and interact with agricultural messages, providing valuable insight for communicators. Eye-tracking has also been used in the classroom to analyze how students are learning. A study about visual literacy found students who had completed an agricultural photography class had observably different gaze behaviors than those who had not

completed the course (Redwine et al., 2018). At Texas Tech University, researchers have conducted a study assessing how consumers navigate the Maschoff's pork production website. Current research is using eye-tracking to analyze visual attention toward clean labels on food products.

Future Plans/Advice to Others

As agricultural communication practitioners seek to connect with a diverse audience, eye-tracking can lend unparalleled insight into the specific aspects of media different groups deem salient. Such data can enable researchers to explore how varying demographics and psychographics of audiences influence viewing patterns, illuminating the linkage between cognitive interpretation of information and purchasing behaviors. Eye-tracking may emerge as a key tool to aid professionals in tailoring messages and designing elements to most effectively resonate with segmented audience groups.

One barrier to the adoption of this methodology is the expense of the hardware. Establishing partnerships with other units on campus that have this technology may serve as an opportunity for researchers to gain access while mitigating costs. The significance of interdisciplinary partnerships extend beyond the financial incentives, as conducting an eye-tracking study is a technically intensive endeavor. Professionals with expertise in the programming of the hardware are invaluable resources of knowledge for those new to the methodology. The research stemming from such collaborations may also afford the field with fresh perspectives and novel approaches to communication-based empirical inquiries.

Experiments should be conducted with a limited amount of media stimuli as eye-tracking produces a large amount of data after each collection. Labs should be free of distractions, and researchers should take care to shield computers from direct sunlight. Additionally, as eye-tracking is a relatively new methodology in agricultural communications, researchers should invest time surveying the literature to learn the relevant applications of eye-tracking for their purposes and expend effort to receive proper training for operating the technology. Depending on the study design, each data collection may require a great deal of time to complete. As such, researchers should design their study to avoid participant fatigue and schedule such participants to avoid researcher fatigue in the lab. In order to avoid collecting data from participants not part of the population of interest, a careful entry questionnaire should be completed by the potential participant before scheduling the eye-tracking session.

Cost/Resources Needed

Eye-tracking equipment is a significant investment, ranging from $20,000 to $35,000. Several companies offer different models to meet research needs, from wearable glasses to hardware mounted on a computer screen. A computer-mounted device is typically found in the lab, while head-mounted devices can be used for field experiments (Duchowski, 2017). A dedicated lab room and computer, as well as training for those conducting eye-tracking research, are also necessary. In addition, eye-tracking research takes a large amount of time and resources to develop and conduct studies. Researchers should utilize calendar scheduling to arrange participants in line with lab and researcher availability.

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Fresh Perspectives:
Diversity and Inclusion Training for Student Organizations in a College of Agriculture

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Fresh Perspectives:
Diversity and Inclusion Training for Student Organizations in a College of Agriculture

Introduction/Need for Idea

Student diversity in institutions of higher education continues to increase (Beimers, Warner, & Mackie, 2013; Enyeart Smith, Wessel, & Polacek, 2017; Seidman, 2005). However, the level of inclusion and sense of belonging perceived by underrepresented groups is uneven (Drape, Anderson, Church, Jain, Slabach, & Amaral, 2017; Johnson, Soldner, Leonard, Alvarez, Inkelas, Rowan-Kenyon, & Longerbeam, 2007; Sanchez, DeFlorio, Wiest, & Oikonomidoy, 2018). Drape et al. (2017) called for colleges of agriculture to intentionally prepare their students to learn and work with a culturally diverse population. Consequences of such targeted work are improvement in the overall campus climate and a student body with a better understanding of self in relation to the grander campus community (Hurtado, 1992; Kuk & Banning, 2010).

Diversity is an ever-present concern on university campuses. Cal Poly and the College of Agriculture, Food and Environmental Sciences (CAFES) experienced a series of racially charged events in the spring of 2018. It is believed these events impacted the fall 2018 enrollment of accepted underrepresented students and damaged the institution's reputation. While measures were taken to address diversity and inclusion through coursework and university-wide speaking events, the Agricultural Education and Communication (AEC) Department elected to develop curriculum to be shared monthly in college student organization meetings for the 2018-2019 academic year. *Fresh Perspectives* (*FP*) was developed to empower CAFES club members with the tools and dispositions necessary to begin and guide conversations surrounding diversity and inclusion, from a place of respect and understanding.

How it Works

A leadership team comprised of an AEC Department faculty member and three students with training experience produced a series of nine, fifteen-minute instructional modules suitable for adoption in monthly CAFES affiliated club meetings. Module topics were developed based on student feedback received from spring 2018 campus debrief forums. The curriculum series falls into a continuum of three themes, containing the following titles (in italics) and objectives.

1. Communication: (a) *Developing and Delivering Key Messages* - Synthesize and deliver key messages using a model structure, (b) *Communicating the Brand* - Explore ways to model brand expectations through interactions with others, and (c) *Communicating Through Adversity* - Apply techniques for communicating effectively in challenging/stressful situations.
2. Relationship Building: (a) *Engaging in Conversation* - Implement strategies to initiate, engage in, and close a conversation, (b) *Respecting Diversity* - Demonstrate actions which model respect for diverse groups and ideas, and (c) *Constituency Building* - Create a constituency building plan to develop relationships with those outside the organization.
3. Influence: (a) *Understanding Influence* - Explore the core tenants of leadership and use them to craft a personal mission to positively and purposefully influence others, (b) *Planning for Change* - Utilize the principles of planned change to cultivate a plan for organizational change, and (c) *Servant Leadership* - Examine the principles of servant leadership within the context of the campus dynamic.

The *FP* Leadership Team presented a new module to representatives of the 21 clubs and organizations recognized by the CAFES Student Council at each monthly Council meeting, in a train-the-trainer experience. Club representatives then presented the module to their respective club members at their monthly meetings.

Results to Date/Implications

As of February 25, 2019, five modules were presented to the CAFES Student Council. Because club representatives unknowingly had *FP* added to their responsibilities when they returned to campus in fall 2018, the *FP* Leadership Team wanted to solicit their feedback through a Google Form instrument distributed through campus email. 67% of club reps reported they completed three or more of the modules received and all respondents shared the modules took no more than 15 minutes to complete. When asked how their club members felt about *FP*, 17% stated *positive* while 83% stated *acceptable*. Reasons for finding the modules *positive* include: high member engagement and greater personal familiarity with the topics. For those perceiving the member time as *acceptable*, the disconnect between the *FP* content and their club's purpose made the trainings awkward. They also cited it was challenging to get the members to engage. When asked about the level of support their other club officers gave to *FP*, 83% felt they were *very supportive* and demonstrated this support by discussing it at officer meetings, assisting in the presentation of modules, and critically reflecting on club operations in response to the modules. Regarding how the training role affected club representatives, survey participants cited personal growth in several areas including: leadership, presentation skills, verbal communication, and personal confidence. To date, the club representatives' key take-aways are: understanding it is necessary to voice concerns, interaction with those who are different is important, and taking the time to discuss these issues has helped them learn more about themselves and others.

Future Plans/Advice to Others

FP was created and facilitated in response to the challenging events Cal Poly experienced related to diversity and inclusion in the 2017-2018 academic year. These events prompted quick reflection to identify practical ways to help the CAFES student body develop the skills and dispositions to work and learn in harmony with others (Drape et al., 2017). *FP* was a way to contribute to a multi-faceted approach to educating students in the classroom, through larger campus events, and through student organizations. Based on program feedback, the *FP* Leadership Team plans to present an additional facilitation session at a CAFES Student Council meeting to help club representatives feel more confident and competent with presenting future modules. Additionally, the Leadership Team will review and revise the curriculum. One participant recommended offering *FP* as a quarterly workshop series, to bring all CAFES club members together for training and exploration with the larger college community.

Costs/Resources Needed

FP is possible due to the commitment of passionate faculty and students and the support of the college community. Each member of the Leadership Team volunteered their time. There were no financial costs associated with the program. However, should the workshop series be pursued in the future, costs associated with incentivizing students to attend an additional training event (ie. food, venue, sound equipment, etc.) would be incurred.

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Handshakes and Hellos: Using a Brief Introductory Meeting Assignment to Improve Perceptions of Teacher Immediacy

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Handshakes and Hellos: Using a Brief Introductory Meeting Assignment to Improve Perceptions of Teacher Immediacy

Introduction/ Need for Idea

The higher the quality of relationships students have with their instructors as well as their peers, the higher the quality of their college experience (Astin, 1993). Relationship development at the course level, particularly at the beginning, is critical to the success of the course and its students (Felder & Brent, 2016). Displaying verbal and nonverbal teacher immediacy behaviors can shorten the distance between student and instructor, helping to increase student motivation and engagement (Carrell & Menzel, 2001; Estepp, 2012; King & Witt, 2009). Learning the names of students and something about them can go a long way toward establishing direct connections and tailoring the class to student needs and interests (Felder & Brent, 2016). In an attempt to connect with as many of the 94 students as possible, those enrolled in a non-major agricultural communications course at [university] were assigned a questionnaire and one-on-one meeting with the instructor at the beginning of the semester.

How It Works

Students were assigned an activity for a small amount of pass/fail credit that required they complete a short questionnaire about themselves, then meet the instructor to submit the questionnaire and briefly discuss it. Students had a two-week period at the beginning of the semester to complete the assignment. The questions were:

- First and last name
- Year, major and minor (if applicable)
- Where are you from?
- What is your favorite TV show(s) and/or movie(s)?
- Do you work? If so, where? How many hours each week, on average?
- How can I best help you be successful in this class?
- What is something I should know about you?

The meeting took place during the instructor's office hours, which were twice a week for one hour each, or immediately before or after class, which was held three times a week. Given these parameters, students were responsible for finding a time that worked best for them to meet with the instructor. When the student arrived, the instructor shook hands with the student, asked their name, then skimmed the survey before briefly discussing one or two pieces of information the student provided. On average, the individual meetings took between two to three minutes.

Results to Date/ Implications

The student responses were used by the instructor to tailor examples used during class lectures, as well as to put students into teams for a group work assignment later in the semester. Responses also made the instructor aware of any special circumstances held by students, making the instructor better able to address issues as they arose.

In order to evaluate whether the students liked the instructor meeting assignment, students were asked, "Thinking back to the beginning of the semester, did you like the Meet [instructor] assignment?" and "Why did you like or dislike the Meet [instructor] assignment?" as a part of a Qualtrics questionnaire.

Approachability
Many students brought up the reason for liking the assignment to meet the instructor because, "it made it easier to consult [instructor] for future assignments because we had already met." The course took place in an auditorium style classroom with more than 90 students enrolled, so the assignment, "minimized intimidation of a large classroom setting." By requiring an initial meeting to break the ice, students reported the assignment, "created a safe space to ask any questions or elaborate on concerns."

Connection
The meeting activity established a personal connection between the student and the instructor Several students provided statements along the same lines as indicating the assignment, "gave a personal connection with the teacher and helped encourage a one-on-one relationship down the road." Learning the name of each student as well as a little about them was an important part of that connection as, "it made it seem like I wasn't just a number in a class and actually a person to my professor."

Caring
Taking a few minutes to formally meet each student helped to establish, as one student put it, "a sense that the teacher cared and respected the students." Students reported appreciating the opportunity to close the gap between the lectern and the school desk as, "It showed me that she cared for us and wanted to get to know us." Several students conveyed the feeling of being "important, and as if my presence in the class truly mattered."

Negatives
Although 77 of the 80 student respondents reacted positively regarding their feeling about the assignment, a few students did not like the activity. Of those, one reported forgetting to do the assignment, another indicated an inability to find a convenient time to meet due to other obligations, and the third refused the assignment as they believed, "It is against school policy to force someone to meet with the instructor outside of class for a grade." This statement is a misinterpretation of university policy.

Advice to Others

Instructors who choose to integrate this activity into their coursework should consider planning some time immediately before or after class for students to complete the meeting as this was the most popular time students wanted to meet. In addition, office hours should be provided to students so they can drop in to meet the instructor. This approach lowers the number of meetings which must be scheduled via email or personal conversations. In addition, this meeting can establish the meaning and availability of office hours in the minds of the students, encouraging them to make use of the time for questions and concerns later in the semester.

Costs/ Resources Needed

This activity can be executed at no cost to the instructor or students. Each student will need to be supplied with the response survey either in hard copy or electronic form. Students will need to submit their survey via hard copy during the meeting with the instructor.

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How do I…? Using Adobe Spark Video to Create Explainer Videos

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How do I…? Using Adobe Spark Video to Create Explainer Videos

Introduction/Need for Innovation

Researchers have demonstrated the value of the learning by teaching effect, exhibiting how spending time teaching nurtures a greater understanding and knowledge retention of a subject (Fionella & Mayer, 2013; Graesser et al., 1995; Roscoe & Chi, 2007; Webb, 1982) because the practice encourages reflective thought, a pivotal component of the learning process (Roberts, 2006). Educators have sought creative ways to integrate learning by teaching into their practices to enhance comprehension of classroom material (Rohrbeck, Ginsburg-Block, Fantuzzo & Miller, 2003). One approach to do this is the creation of explainer videos. An explainer video conveys "complex facts to a target group within a very short time" (Kramer & Bohrs, 2017, p. 254). Additionally, the emergence of search engines has prompted society to increasingly pursue answers online, often in the form of brief videos (Nagy, 2018; Livingstone, Bober, & Helsper, 2005). As individuals search for information, videos have emerged as a compelling format to engross audiences and visually illustrate solutions or concepts (Kramer & Bohrs, 2017).

Although many programs exist to create videos, these often require time and expertise to use effectively. One option to create explainer videos that requires little pre-existing knowledge is Adobe Spark Video. This cloud-hosted program encourages users to quickly create brief videos using a combination of text, icons, photos, videos, and narration. The structured nature of Spark Video makes it an ideal channel for crafting explainer videos, which inherently rely on a structural step-by-step process. The purpose of this innovative idea was to integrate this program in an advanced agricultural communications course as an assignment for students to create explainer videos thereby demonstrating the learning by teaching effect.

How it Works

Students in the course were provided with an assignment sheet explaining the purpose and steps to complete. They had to propose a topic for their explainer video that provided advice for how to create better online content. This could be for a specific social media platform, blogging, website design, online video, online strategy, or other relevant topic area. The goal of the brief video was to provide advice about a specific concept, technique, or skill.

After they received instructor approval for the topic, students used online resources and their own experience to write a script that contained both the visual and audio aspects of the video. This was submitted as a Word document and evaluated prior to completing the video. Students used the feedback from the script to gather necessary materials for the video such as photos, icons, and screencasts.

Within Adobe Spark Video, they created videos no more than 3 minutes in length. To do this, students went to adobe.spark.com and chose to create a video project. They then selected options from a wide array of templates and customized the video with color schemes, layout patterns, graphics, fonts, icons, transitions, and background music. The videos are a compilation of slides similar to a PowerPoint. Each slide is limited to 10 seconds unless it contains video or voiceover narration. In that case, the slide can be up to 30 seconds long. After the slides were complete, they recorded a voiceover narration to accompany the visual elements. Finally, the finished video

project was “shared” to generate a URL that could be submitted to the learning management system and shared with others. The videos were evaluated on effectiveness of the advice and/or instructions, use of visuals, and accompanying voiceover.

Results to Date/Implications

The course had 50 students resulting in 50 explainer videos on topics relevant to online communication. Content presented in the videos ranged from coordinating social media accounts with Hootsuite and Loomly to creating engaging content for Facebook, Instagram, and Twitter. Some videos addressed skills such as photography, and social media analytics while others providing advice for Canva and LinkedIn

While using Adobe Spark Video, students learned about a specific topic and gained experience creating brief videos. For students acclimated to the more advanced features of Adobe Premiere, Adobe Spark Video’s template was sometimes viewed as a limitation, but others recognized it forced them to be more creative to accomplish the overall purpose. Complex content and topics may benefit from a more sophisticated program that allows for advanced customization.

The videos can be widely disseminated beyond the classroom environment and serve as a product for their portfolios. Additionally, these videos can be shared on the department’s social media presence to demonstrate the expertise students are developing and provide valuable content for audience members.

Future Plans/Advice To Others

Adobe Spark Video will continue to be used in this course and can be implemented in other agricultural communication classes to have students develop explainer videos about photography techniques, journalistic interviewing, or graphic design. Additionally, explainer videos documenting a timely agricultural issue could challenge students to research and summarize a complex topic and engage audiences using a novel approach.

The value of Adobe Spark Video reaches beyond agricultural communication classrooms, holding potential to be integrated in agricultural education courses. The program enables students to creatively share information on a breadth of topics, from floral design techniques to synthesizing an animal’s digestive system track.

Students wrote scripts to plan and organize their voiceovers of the content, and many students expressed the helpful nature of the written narrative. Investing time to thoughtfully craft a detailed script is recommended to streamline the assembly of Adobe Spark videos.

Costs/Resources Needed

Adobe Spark Video is user-friendly and does not require technical expertise or training. The Adobe Spark Starter Plan, which also includes Spark Post and Spark Page, is offered as a free service. While users can create, share, and post content, slides are watermarked with #AdobeSpark. The full version of the software is available as part of the Adobe Creative Cloud package or as a stand-alone plan for $9.99 a month. The paid service enables the creation of branded stories with the user’s logos, color, and fonts. As Adobe Spark is a cloud-based service, internet connection is required.

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Listen to the Music: Introducing Music to Reduce Test Anxiety and Improve Test Performance

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Introduction/Need for Innovation

The concept of academic performance anxiety is nothing new to higher education. Students are now experiencing multiple types of anxiety which play a large part in determining academic success in addition to memory, cognitive controls, and various motivational and emotional factors (Beilock & Ramirez, 2011). Cognitive test anxiety is one of the leading issues facing college students today affecting approximately 20% of all students (American Test Anxieties Association, 2019) and has been found to be most prevalent among females, students with high emotionality, and students with high performance worry (Cassady & Johnson, 2002; Hembree, 1988). While there are numerous factors affecting the exam performance of college students including preparation, intelligence, test-taking ability, and luck, test anxiety can have a major impact on students' academic performance with up to an 8% variance in test scores related to test anxiety (Cassady & Johnson, 2002). Additionally, Farooqi (2012) found that high test anxiety tends to lead to poorer academic performance in students and suggested therapeutic interventions be implemented in academic institutions to minimize anxiety levels.

Research has shown music can help individuals overcome anxiety and accomplish more difficult tasks (Perlovsky, Cabanac, Bonniot-Cabanac, & Cabanac, 2013). For test anxiety, multiple studies have found that listening to pleasant, calming music can lead to higher academic performance (Lilley, Oberle, & Thompson, 2014; Perlovsky et al., 2013). This has led to recommendations of further incorporating music during exams to minimize stress and anxiety. While this is not necessarily a new idea, the rising anxiety levels of college students have created a need for interventions to be explored to promote the success of students in academic programs. Reducing student performance anxiety could lead to more meaningful and engaged learning experiences for students, which is the focus of Priority Area 4 of the AAAE National Research Agenda (Roberts, Harder, & Brashears, 2016).

How it Works

As anxiety and outside stresses continue to increase and draw on added pressures of current students, the idea of using music as a way to reduce test anxiety was developed and tested on a small scale. The instructor of an agricultural economics course at Texas Tech University made the decision to play relaxing study music during exams to see what impact it had on students' performance. As most classrooms at Texas Tech University are equipped with a computer and speakers, this was a feasible and easy to implement idea. The music was found on YouTube.com and was entitled "Relaxing Music for Studying and Concentration." The instructor played the music for the duration of each exam at a low volume level that was barely audible to students so that it could be heard but was not a distraction during the exams.

Results to Date/Implications

During both exams given in each semester of this course, the instructor observed students as they completed their exams. It was noted that when the music was played students spent more time on the exams, and the occurrence of students leaving before the exam was complete was eliminated. Prior to playing the music, students often left very early in the exam period, sometimes as early as 15 minutes after the exam was handed out. Students in the course also expressed their preference for having the music played during their exams and even asked the instructor to play it during the second exam when he forgot to turn it on at the beginning of the exam period.

When looking at the average exam scores following the two semesters in which music was introduced into the testing environment, exam scores increased overall (Table 1). The data reported reviews exam scores over seven semesters with 1.5 of them including scores with music intervention. For Exam 1 scores from the fall semesters, students averaged 80.5%. There is no data for Exam 1 scores with the music intervention as it was implemented during the second exam in this semester. The fall Exam 2 scores without music averaged 84.5%, and exam scores with the addition of music averaged 90.6% showing a 7.2% increase. When looking at the scores from Exam 1 in the spring semesters, students averaged 81.8% without music and 86.6% when music was incorporated. This showed a 5.9% increase in exam scores. The Exam 2 scores from the spring resulted in an 80.9% average without music and 88.3% average with music expressing a 7.3% increase in exam scores.

Table 1

Average Exam Scores and the Incorporation of Music

Exam Scores	Without Music	With Music	% Increase
Fall Exam 1	80.5	-	-
Fall Exam 2	84.5	90.6	7.2
Spring Exam 1	81.8	86.6	5.9
Spring Exam 2	80.9	88.3	7.3

Future Plans/Advice to Others

The addition of music during exams in this course provided an atmosphere in the classroom which encouraged a more productive environment to evaluate students' knowledge and capability. The desire for music expressed by students and the increased completion rate of the exams reinforced the instructor's idea of adding music to reduce test anxiety. The exam scores following the introduction of music during the exams showed a noteworthy increase in scores. Additionally, the increased time students spent on their exams and the increased completion rate has encouraged the instructor to continue implementing music during exams to provide a motivating and calming environment for future students to excel. This will provide an opportunity for the instructor to minimize outside factors and stresses and test for students' knowledge of course material. Future assessment of the use of music during exams will include examining student opinions to ensure this intervention is well received. The addition of music to the exam environment will continue to be evaluated and will be encouraged in other courses throughout the department and the College of Agricultural Sciences and Natural Resources at Texas Tech University.

Costs/Resources Needed

As many higher education classrooms are already equipped with a computer, speakers, and internet access, this concept should be simple and free of cost to apply in future classrooms. A wide variety of music is available through many free online outlets, including YouTube, Pandora, Spotify, and many others. As long as the instructor has a working knowledge of any of these online music outlets and the classroom technology, the addition of soft music to create a calming test environment and ease test anxiety may allow instructors to more accurately evaluate students' subject knowledge and mastery of course material.

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Microsoft Suite for Future Agricultural Education Instructors: Weekend Short Course

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Introduction/Need for Innovation or Idea

The need for in-service for beginning and experienced teachers in computer technologies has been documented in agricultural education literature (DiBenedetto, Willis, & Barrick, 2018; Kotrlik, Redmann, Harrison, & Handley, 2000; Layfield & Dobbins, 2002). "Teachers need and value increased knowledge and skills in the area of information technology" (Kotrlik, Redmann, Harrison, & Handley, 2000, pp. 27-28). Williams, Warner, Flowers, and Croom (2014) surmised school-based agricultural education (SBAE) teachers commonly used computer software programs like Microsoft Word, PowerPoint, and Excel in their planning and instruction. Additionally, Williams et al. discovered nearly 90% of SBAE teachers in their study used Microsoft Word at least 2-3 times per week and more than 75% used PowerPoint at the same frequency. DiBenedetto, Willis, and Barrick (2018) identified computer technology as a needed competency across three decades. There is an opportunity to provide instruction for teachers to gain skills through a focused approach of technology integration in all areas of SBAE.

The purpose of the *Microsoft Suite for Future Agricultural Education Instructors* weekend short course at Oklahoma State University is to develop pre-service teachers' skills in Microsoft Suite programs as it pertains to SBAE instruction. Pre-service teachers enrolled in the course are refreshed on the basics of Microsoft Suite software and learn how to optimally utilize each of the programs to improve program management and classroom instruction.

How It Works

The *Microsoft Suite for Future Agricultural Education Instructors* weekend short course focused on concepts and projects that would directly benefit future SBAE teachers. The one-credit hour course composed of 15 contact hours was held on a Friday evening and the following Saturday. The course was divided into four segments, *Microsoft Excel, Microsoft PowerPoint*, *Microsoft Word,* and *Combined Use,* and included bonus projects in the corresponding Google platforms. Pre-service teachers completed and submitted a total of 15 projects in a digital portfolio.

The sequence of projects allowed pre-service teachers to build upon skill sets mastered in previous projects. For example, pre-service teachers created a banquet script with section breaks, page numbers, and styled headings to feed the automated table of contents. Other projects included creating an Excel database of sponsor names and addresses that were used to feed the mail merge component on a given Word form letter. In addition to Word and PowerPoint projects, pre-service teachers were challenged to create spreadsheets in Excel using basic addition, subtraction, and average functions. They also learned how to separate text to columns and combine text using the concatenate function. All of the projects placed the skills in the context to which the pre-service teachers might use them in their future roles, including managing pre-service teacher lists for FFA conference registration, calculations for average daily gain and projected weights, and creating invoices for pre-service teachers.

Results to Date

Fourteen pre-service teachers enrolled in the course in Fall 2018, and the course is set to run again in Fall 2019. Pre-service teacher feedback was positive, and many asked if the class could be longer or taught as a one-hour per week class to give more time for assignments and allow the instructor to "add more things that we could potentially use in our future careers". Although the course was extremely content heavy and fast paced, the instructor provided step-by-step instructions for each project in a handbook the pre-service teachers were able to take with them upon completion of the course. A modified short course was also presented to the Spring 2019

student teachers during their pre-student teaching seminar. With a shortened time period, only three projects were introduced, but the pre-service teacher handbook was given as a resource.

The course was an excellent opportunity for pre-service teachers to learn how Microsoft Suite could be used more concisely in their future roles as agricultural educators. One pre-service teacher said, "I liked how relevant all of the information was. Things like the tickets and the certificates could be really tedious, but were actually really easy!" Another pre-service teacher shared, "I thought the class was very helpful not just for my future classes but definitely as a teacher. I really liked learning how to use all the different tools within word and excel because I was not very comfortable with excel before this class." A pre-service teacher surmised, "It was a very technical class, which suited a hands-on learner like myself very well… The course completely optimized my productivity using Microsoft Suite."

Future Plans

Classes such as this are necessary in order to continually meet the technology needs of pre-service agricultural education pre-service teachers. Future plans include offering this course regularly for pre-service teachers and the modified short course for student teachers. Also, considering technology encompassed three of the top five highest in-service needs of experienced teachers identified by Layfield and Dobbins (2002), it is also planned to develop an in-service workshop, or series of workshops for teachers currently in the SBAE classroom.

By using a targeted technology approach for in-service teachers, opportunity awaits to provide this class as an in-service for current teachers. The hope is this educational experience will provide an opportunity for pre-service and in-service teachers to: (1) learn skills that directly benefit them in all SBAE areas, and (2) optimize productivity and efficiency with departmental management which can ultimately make them more successful in the classroom.

Costs/Resources Needed

This course could easily be mobile, and taught in any classroom with a projector if each pre-service teacher had access to a laptop computer. The success of this weekend course was in large part to the support of the Oklahoma State University Agricultural Education, Communications and Leadership Department and the availability of a state-of-the-art computer lab. For this class, the first four projects were completed using the departmental computers. This allowed for consistency in programs for the instructor to be able to show where tools were located in the programs used. Additionally, student fees at Oklahoma State University provide for all students to have access to a free download of Microsoft Suite. Once pre-service teachers were comfortable in the Microsoft Suite, they were given the option to use the computers provided or to use their own laptops. Allowing pre-service teachers to use their own laptops proved beneficial after the course was over as the pre-service teachers were familiar with the programs on their own machines.

The handbook developed by the instructor was based off previous experience with the specific projects for the class. Pre-service teachers were required to download or print the course handbook before coming to class, but the handbook could easily be printed ahead of time by the instructor for a minimal print price. The handbook includes step by step instructions for each of the projects, and provides tips and tricks for the different programs, including toolbar button descriptions for each program and a list of useful keyboard shortcuts used across the Microsoft Suite. The handbook has already seen revisions and will continue to be revised to as the computer technology needs of pre-service teachers evolve.

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Poster Type: Innovative

One-Page Research Summary Series: Bridging Research and Practice

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Introduction and Need for Innovation

The mission of land grant universities in the United States is to provide education to the everyday citizen, serve local communities within the state, and communicate research with the people so it can be imbedded into practice ("The University of Arizona Land-Grant Mission: It's Contemporary Relevance", 2012). Agriculture was a key discipline within the original land grant legislation, which expanded the land grant mission to include agricultural experiment stations and what we now know as Cooperative Extension. In departments of agricultural education and related fields across the nation, many research agendas conducted by faculty and graduate students are focused on improving methods of practice within school-based agriculture education (SBAE). This leads to the following question: how do we ensure our research reaches teachers, administrators, and other educational professionals within school systems across the state? One solution for bridging the research gap between universities and SBAE teachers is the one-page research summary series. With current technological advancements, the ability to share information quickly and frequently has surpassed previous attempts at a similar practice. By sending out research summaries to the members of our state's SBAE teacher association via our state-wide listserv, our department can facilitate the dissemination of research to non-research entities, improving our ability to impact those communities and create positive change.

How it Works

Single-page summaries of empirical work (e.g. theses, dissertations, journal articles, etc.) are developed that highlight the key findings, discussion, implications, and recommendations for practice. These one-page summaries are department branded and then released on the state's agriculture teacher association email listserv to reach the targeted audience. Topics included in this series are purposefully selected to ensure they are relevant to high school practitioners and have the potential to impact their current situations. Additional components of the research such as extensive introductions, literature reviews, frameworks, and methodologies are edited down to avoid jargon for the reader and to leave more room for the findings, implications, and recommendations of the study. The one-page format forces the author to boil down the components of their study to the most salient contributions and increases the likelihood that their work will be read by busy professionals.

Distributing these items through an email listserv reaches individuals who may be unable to receive updates on research and practice in other ways. In a state with many rural SBAE programs, attending conferences and other professional development opportunities where portions of research may be shared can often be unrealistic and typically only occurs a few times per year. Additionally, the simplistic nature of the single-page design creates an easy-to-read document that pulls readers in and allows for the most important concepts to emerge. If readers are interested in learning more about a topic, contact information is provided for the author(s) of the study. All graduate students completing a thesis or dissertation are required to create a one-page research summary and departmental faculty are encouraged to create these, particularly if their topic is of relevance to the target audience.

Results to Date and Implications

As a direct result of the one-page research summary series, teachers have become more invested in the work conducted at the university. They are more likely to participate in subsequent research studies because they can see the direct impact from their participation.

Teachers also recognize the value of these research efforts and have begun engaging in critical dialogue about various topics related to SBAE that contributes to our growing understanding of the field. Many teachers in our state have responded positively to this effort and have used some of the research recommendations to inform their practice and make decisions related to classroom instruction, curriculum, Supervised Agricultural Experience (SAE), and FFA. This idea has also received support from the National FFA Local Program Specialist who commented, "your colleagues should be doing this in every state" (Crutchfield, N., personal communication, May 15, 2019).

Furthermore, the impact on our state has spanned beyond research needs. This effort from the university to communicate research has opened the door for further dialogue and partnerships between the university and SBAE teachers. Often, we have teachers ask, "what exactly do you do within your position at the university related to research?" The one-page research summary series sheds light on the significant research being conducted at the university level and clearly illustrates to teachers that the ultimate purpose of university research is to improve practice within the communities that we share.

Future Plans

Creating these summaries have become an expectation for our graduate level students upon defending their theses or dissertations. Because of the positive feedback received, we hope to further capitalize on departmental faculty research in the future. Additionally, there is a wide array of research that exists beyond our university. One future effort is to include one-page summaries on topics of interest that expand beyond research conducted in our state. While research that is specific to the communities in our states is valuable, there are other empirical studies being conducted nationwide that may be of interest to our teachers. This could expand to listservs of other educational entities, such as one for administrators, or school career and technical education directors.

Perhaps this effort can occur in conjunction with other similar efforts to bring research to teachers including *Owl Pellets: Tips for Agriculture Teachers* podcast (2019) and publication of the *Agricultural Education Magazine* (2019). The format and dissemination could be similar to the *Monday Morning Monitor* (National Council for Agricultural Education, 2019) or *Friday Footnotes* publications (Moore, 2019), but specifically with a research focus. Should this project develop to a national scale, a needs assessment survey should be conducted to maximize effectiveness and relevance. While similar efforts have existed historically, they have not been maintained consistently. The technological age allows for greater access to the communities we serve and an opportunity to capitalize on communication with individuals who have the power to take the recommendations and put them into practice.

Costs and Resources Need

By using an email listserv, the cost of this one-page research summary series remains relatively low. However, as the series evolves, personnel to manage the creation and distribution of the summaries will be needed. An increase in volume of summaries may also result in the need for management of an online platform to access older summaries. Nonetheless, this is a cost-effective and time efficient method for disseminating research.

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Purposeful Video Reflection – A Program-Wide Swivl Adoption

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Purposeful Video Reflection – A Program-Wide Swivl Adoption

Introduction

Video technology provides an opportunity for advanced training practices and feedback platforms for preservice teacher preparation (Bueno de Mesquita, Dean, & Young, 2010). To align with Council for the Accreditation of Educator Preparation (CAEP) Standard 2 and "include technology-enhanced learning opportunities" (CAEP Standard 2.3, 2013), Oklahoma State University (OSU) agricultural education teacher preparation program adopted and integrated Swivl video reflection throughout the core agricultural education courses and clinical teaching experience. Additionally, Swivl technology supports the Praxis Performance Assessment for Teachers (PPAT) Task 4 requirements regarding video evidence for teacher certification in Oklahoma.

Swivl video integration not only provides a platform for self-reflection but also an opportunity for effective feedback. The feedback is provided by peers, instructors, graduate teaching assistants, and faculty. Reinforcement of the knowledge, skills, and dispositions highlighted throughout the program at OSU, aligns with recommendations for nurtured feedback as reported by Borko et al. (1992). The use of video technology integration reflects the American Association for Agricultural Education's Research Priority 5: Efficient and Effective Agricultural Education Programs (Roberts, Harder, & Brashears, 2016). The agricultural education teacher preparation program at OSU provides opportunity for students to participate in purposeful pre-clinical and clinical reflections using Swivl technology.

How It Works

Pre-Clinical Integration

The process begins during the first semester in the agricultural education program as students learn the four parts of a lesson plan (i.e. introduction, presentation, application, and review/closure) in their foundations and philosophies of agricultural education course. Students develop a micro-teaching lesson plan to present to their peers during a lab. The presentations are 15 to 20 minutes and are recorded using Swivl devices. Videos are then uploaded to the Swivl cloud and the student reflects on the experience. Peers and teaching assistants also provide time stamped comments.

During the teaching methods course, students are charged with teaching four complete lessons using specified teaching strategies i.e., modified lecture, simulation/demonstration, case study, and STEM. Each lesson is taught to agriculture students in a secondary classroom and recorded using Swivl technology. The complete lesson videos are uploaded to the Swivl cloud with lesson plans and PowerPoint presentations for review by the student, peers, and course instructors. These learning activities prepare pre-service teachers to complete the fourth task associated with the PPAT. In both pre-clinical experiences, students receive feedback prior to future teaching experiences, providing an opportunity for personal reflection and student growth.

Clinical Integration

The final piece of Swivl integration occurs during the clinical teaching internship when pre-service teachers conduct weekly reflection videos using the Swivl app and upload the videos to

the Swivl cloud for viewing and feedback by university supervisors and peers. The weekly reflection videos are approximately five minutes in length and are intended to reflect on the previous week using the lens of the three-component model of agricultural education. Again, student teachers receive feedback from peers and OSU personnel.

Results to Date

Students' who have participated in Swivl video reflection during their pre-clinical and clinical experiences have benefitted from the personal, peer, and faculty feedback. Pre-clinical experiences featured an opportunity for personal growth outside of class time through video observation and reflection. Pre-service teachers report the video reflections provide an opportunity to reflect weekly on their clinical teaching experience, while having the ability to virtually connect with peers, helped develop an extended sense of community. Student adoption of the new technology has been seamless, as today's students utilize technology regularly and find it to be a dominant force in their lives (Giovannelli, 2003). A key to the seamless transition is also attributed to the training provided to the students on Swivl technology and the repetition of use throughout the program. Although students are quick to pick up the technology, there have been issues with the management of the technology, i.e., keeping the Swivl robots and iPads updated, along with maximizing available storage on the devices for video recordings.

Future Plans

The agricultural education teacher preparation program at OSU plans to continue to implement purposeful video reflection throughout the pre-clinical and clinical teaching experiences for pre-service teachers. Further development of guided reflections will help to continue to improve the overall value of the reflective process. The agricultural education department plans to purchase additional Swivl robots to increase the availability of robots for use not only for the opportunities discussed above but also for video observation of pre-service teachers during their 15-week clinical teaching experience. The faculty at OSU intend to find ways to integrate reflective video technology aligning with CAEP and accreditation standards into the remaining agricultural education courses offered to enhance the program-wide adoption.

Costs/Resources Needed

Materials needed for the complete program Swivl integration include the purchase of multiple robots which provide improved audio and movement tracking during the recording of the lessons. Additionally, the purchase of iPads or tablets to use as the actual recording devices as needed. Otherwise students utilize their own device i.e., tablet or smartphone. The base price for the robot is $600. Quantity needed depends on the size of program and intended integration. The teacher preparation program at OSU currently utilizes 10 Swivl robots and seven iPads. The final cost is associated with the use of the Swivl cloud for video storage with feedback and in-video reflective availability, again depending on the size of program and intended use of the application platform. The program at OSU provides each student with a two-year Swivl account for use during the program. Course fees are utilized to cover the $100 cost.

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Shorten grading time: Using specifications (specs) grading in a writing intensive course

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Shorten grading time: Using specifications (specs) grading in a writing intensive course

Introduction / Need for Innovation

Evaluation is a key component of the teaching and learning process (Bloom, 1956) and instructors spend a great deal of energy and effort to provide students with feedback in hopes of improvement in future work (Orsmond, Merry, & Reiling, 2005). While faculty and staff find enjoyment and reward in working with students, many struggle to manage time when it comes to grading. It is not uncommon for those in higher education to express feelings of dissatisfaction with the grading process (Crisp, 2007). Negative feelings associated with grading can amplify when previously corrected mistakes continue (MacDonald, 1991). Grading writing assignments can be especially time consuming due not only to the length of assignment, but also the tedious nature of correcting writing mistakes and providing explanations.

The aim of specs grading is to reduce time and stress associated with evaluation, shift responsibility to students earning rather than receiving grades, and decrease conflict between teacher and student by using rubrics with detailed standards for either passing or failing an assessment (Nilson, 2015). Huba and Freed (2000) indicated a hallmark of learner-centered teaching involves the learner's understanding of characteristics of high-quality work. Specs grading is designed to lower student confusion and stress pertaining to assignments, and encourage high quality work by removing the opportunity for partial credit (Nilson, 2015).

How it Works

Specs grading assesses whether student work meets certain specifications or requirements (Nilson, 2015). When grading using a specs approach, work meeting or exceeding specifications earns full credit, while work not meeting the specifications receives no credit. In this case, specs grading was applied to one assignment in an online scientific writing course at Texas Tech University. Students were instructed to watch a video about modern animal agriculture practices then write a short journal entry. Journaling was selected because it helps gather insights about student attitudes (Robinson, 1995) and enhances critical thinking, challenges perspectives, and provides a practical way to understand content (Heimstra, 2001).

The instructor created a rubric that clearly outlined five characteristics of a satisfactory assignment, and five characteristics of an unsatisfactory assignment. To receive a satisfactory grade, students needed to have no more than five issues with grammar, spelling, and punctuation, no unclear sentences, his or her name on the assignment, between 75 and 100 words, and submit a Word or PDF file of the assignment. If each of these standards was met, the student received the full 25 points associated with the assignment. If any of these specifications were not met, grading stopped, and the student received zero points on the assignment. Within the assignment description posted online, students were informed assignment grading was different than in the past and were encouraged to carefully review the rubric for grading criteria. Students were also informed of the grading and assignment details via a weekly announcement email. Students were encouraged to ask questions about the rubric or assignment. A second email was sent later in the week to remind students of the different grading structure.

Specs grading also allows for flexibility and second chances after student work has been graded. Students were informed if their first attempt on the assignment resulted in an unsatisfactory

score, they would be given the chance to correct and resubmit their work for a chance at full credit. The instructor individually emailed each student who did not earn full points with directions on how to resubmit if desired. This was one of the final projects due in the semester and worth relatively few points overall. Instructors selected this timing as it was assumed most of the students had learned proper writing based upon a broad range of previous assignment feedback. Additionally, the assignment was selected for specs grading because the low number of points associated with the assignment was assumed to lessen student anxiety.

Results to Date / Implications

For comparative purposes, a journal response assignment with similar instructions was required the week following the specs graded assignment. The two graders for the course both said they spent significantly less time grading the specs assignments. Specs grading generally takes less time than traditional grading (Nilson, 2015). The grader reviews only certain features of the assignment, allowing less time spent determining partial credit and writing detailed justifications.

While official data were not collected from the students, none asked questions regarding the assignment or rubric. This may suggest the students paid greater attention to assignment details. For example, on the specs graded assignment more students put their names on their assignment than the traditional assignment, despite being a requirement on each rubric. For the writing prompt graded using specs, all 49 students submitted an assignment. Seven of 49 students did not meet the specs of writing prompt one, but four of those seven did successfully resubmit the assignment and earned a satisfactory grade. For writing prompt two, which was graded using the traditional way, 47 of 49 students submitted an assignment by the due date. While the majority of students received full-points on both assignments ($n = 30$), 17 students scored better with specs grading than with traditional grading.

Future Plans / Advice to Others

Specs grading will be used again in future writing courses. However, this approach is not appropriate for every assignment. In the future, more detailed student feedback will be solicited to better understand student perceptions and attitudes pertaining to specs grading. While specs grading appears to have benefits in this case, instructors should be cognizant of other factors associated with the students and the structure of assignments in general. This form of grading can induce student anxiety, instructors must be mindful of this threat and implement safety-net strategies to help students perform at a high level. Lastly, the timing of using specs grading is important. Instructors should consider their students' knowledge levels and abilities to meet the specifications set. Using specs grading on assignments later in the semester are suggested.

Costs / Resources Needed

In order for specs grading to be effective, students must understand the specifications for which they are being evaluated (Nilson, 2015). Therefore, communication is the most important resource involved with specs grading. Detailed rubrics are key and serve as a sort of check-list as students complete their assignments. Additionally, a comprehensive communication plan is required in order to inform students of the grading structure. Finally, instructors must also create a safety-net plan for those students who do not initially meet the required specifications. No monetary costs are associated with specs grading.

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Poster Type: Innovative Idea

Team-based Leadership Curriculum for a Student Leadership Internship Course

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Team-based Leadership Curriculum for a Student Leadership Internship Course

Introduction/ Need for Innovation

Student internships are intended to equip students with communication, leadership, and problem-solving skills through hands-on experiences (Crawford, Lang, Fink, Dalton & Fielitz, 2011). These skills and experiences aid a student's preparedness to enter the workforce (Crawford et al., 2011). In the University of Idaho (UI) Agricultural and Extension Education (AEE) department, we select students, through an application and interview process, for a semester-long course paired with an internship opportunity to coordinate and orchestrate the Idaho FFA State Leadership Conference (SLC). SLC is a four-day event that includes 12 Leadership and Career Development Events, six conference sessions, industry tours, student workshops, service projects, and various other stakeholder events. In 2019, attendance at SLC was nearly 1,500 FFA members.

Over the past 10 years, the roles, responsibilities, and number of the student interns as well as the structure of the course has changed year-to-year. The majority of the course was previously dedicated to completing internship tasks and professional development. Based on feedback on the course and internship experience, we felt there was a need to reconsider how we are preparing these student interns for their roles and the leadership knowledge needed for their success. The most common issue previous interns expressed was a lack of collaboration or knowledge on how to work with other student interns. In response, we restructured internship roles to include three distinct teams with a student director for each team and designed a team-based curriculum focused on the exploration of broad topics prior to application to their SLC internship experience.

How it Works

In 2019, 22 students were interviewed and selected, hired for a specific role, trained, and given responsibility of components at SLC. Student interns are responsible for coordinating and implementing their portion of the conference, collaborating with team members, interfacing with stakeholders, and managing conflict. Students organize their portion of the conference throughout the semester and execute SLC at the culmination of the course.

The 2019 class of interns had specific roles within three delineated teams. The intern teams were created based on their purpose and function at SLC, and include the following: Public Relations comprised of delegates, workshops, service, photography, and social media manager positions; Awards and events comprised of CDEs, proficiency, and STAR award managers; and Sessions comprised of arena, backstage, AV, awards, stage materials, line-up and courtesy corps managers. This team format provides more structure for role assignments, improves the overall function of the internships, and streamlines communication between the interns, AEE faculty, and the Idaho FFA Executive Director. The three teams function on a relatively separate timeline with goals and tasks specific to different components of SLC.

The course begins the first week of the spring semester and continues until two weeks after SLC in April. This is a 3-credit course that meets for one-hour a week and requires outside of class time to complete internship role specific tasks. The curriculum topics and learning outcomes are focused on the process of leadership, building trust and navigating conflict, event planning, professional communication, commitment and accountability, crisis and conflict management, and attention to results. The team-based leadership curriculum is based on *The Five Dysfunctions of a Team* (Lencioni, 2002). Five class meetings were devoted to working on

internship tasks in preparation for SLC. These meetings were interspersed with the above curriculum. This format was designed to prepare students to work effectively with team members and gain the technical skills needs to be successful at SLC.

Results to Date

Anecdotally, the Idaho FFA Executive Director and internship director shared that feedback on the student interns was nearly all positive, which had historically not been the case in previous years. Additionally, in evaluations students reported really appreciating the new team structure and team-based leadership curriculum with 19 (86%) including it as one of the things they appreciated the most about the experience and no students reflected on the team experience was something to improve in the coming years. Regarding the new team structure, one student stated, “I felt that it helped give a lot more structure to real-time problem solving at SLC”. Another student commented on how the curriculum benefitted them as a team member, “it made me really think about who I am as a leader and where I can best make an impact”.

The student interns expressed wanting to keep the team structure and found the team-based leadership focus of the course useful. However, they wanted more time to work on internship tasks in class with their team and the direction and support of the course instructors. The students were in support of meeting two hours a week with one being devoted to curriculum and the other for internship work. Additionally, they felt it would be helpful to interact more often with Idaho FFA Executive Director for instructions and feedback.

Future Plans/Advice to Others

Based on feedback from student interns, the course will be lengthened to two hours a week. The first hour will be spent on the team-based leadership curriculum for the week. The second will be solely focused on teams meeting and working on their internship specific tasks. During the second hour, the Idaho FFA Executive Director will attend via videoconferencing to answer any questions the students may have and provide feedback as needed.

A primary challenge moving forward for the AEE faculty is to find an appropriate student instructor with experience working with the SLC conference. While an undergraduate or graduate student has previously overseen the course, hiring the three team directors as teaching assistants may be a more sustainable way to run this course. We are in current discussion of the process for hiring, training, and supporting these directors. We recommend instructors of like courses and experiences take into consideration the needed knowledge to be successful in their internship experience. One important element in the SLC internship experience was feedback. This feedback helps our students take on challenging tasks and learn from triumphs and areas of improvement (Stripling & Ricketts, 2016).

Costs/ Resources Needed

The Idaho FFA Association provides hotel rooms and food for the students during the week of SLC. This cost fluctuates year to year but is approximately $5,200. One AEE faculty member serves in a curriculum development and advising role for the course. This requires 3-5% FTE. The three new student directors will be needed to manage and direct the course November-April and will be paid a $1,000 stiped each.

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The CoRe of the Problem: How to Help Preservice Teachers Break Down Content

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The CoRe of the Problem: How to Help Preservice Teachers Break Down Content

Introduction/Need for Innovation

An important facet of teacher education is the preparation of preservice teachers to plan effective lessons. However, preservice teachers often fail to grasp the intricacy of lesson planning or connect planning to their teaching practice (Hammerness et al., 2005). An important aspect of planning is pedagogical content knowledge (PCK), the intersection of what teachers know about the content and how they break down the content when teaching (Gess-Newsome, 2015; Shulman, 1986). PCK has been a focus in agricultural education literature with studies centered on preservice teachers, highlighting the influence of personal beliefs, knowledge of content, and context (Rice & Kitchel, 2015; Stewart, Lambert, & Claflin, 2018). As teacher educators, we recognize the inconsistencies in preservice teachers' understanding of lesson planning and their development of PCK. As a way to strengthen the planning process and further develop PCK, we incorporated the Content Representation (CoRe) template into the teacher preparation curriculum.

How it Works

The CoRe template was created to illuminate science teachers' thinking about content (Cooper, Loughran, & Berry, 2015). Originally used as a data collection tool, the CoRe template has also been utilized in professional development and as a tool for curriculum and lesson planning. The CoRe template (Figure 1) includes three main columns which focus on three important concepts for the lesson, or key ideas. The first column in the table lists the prompts to be answered addressing each important concept, for example, "what do you intend students to learn about this idea?" and "why is it important to know this?"

	Important Concept 1	Important Concept 2	Important Concept 3
What do you intend the students to learn about this idea?			
Why is it important for students to know this?			
What else do you know about this idea (that you do not intend the students to know yet)?			
Difficulties or limitations connected with teaching this idea.			
Knowledge about students' thinking which influenced your teaching of this idea.			
Other factors that influence your teaching of this idea.			
Teaching procedures (and particular reasons for using these to engage with this idea.			
Specific ways of ascertaining students' understanding or confusion around this idea.			

Figure 1. Content representation template. Reprinted from *Science teachers' PCK: Understanding sophisticated practice* by R. Cooper, J. J. Loughran, & A. K. Berry, 2015, *Re-examining pedagogical content knowledge in science education*, 60–74.

The CoRe template was employed twice during 2018-2019 in our program to assist a cohort of preservice teachers in planning lessons and think about the practice of teaching. Preservice teachers were first introduced to the CoRe template during the fall term as they prepared for a microteaching experience.

The second experience was during a student teacher seminar workshop on breaking down content for the agriculture classroom. Preservice teachers were given a scenario around an introductory agricultural education topic, parts of the cell, as a basis for class discussion and topic to complete the CoRe template. The session began with a discussion about the topic and brainstorming ideas as a group, which led to a reintroduction of the CoRe template and its purpose. They worked together to identify important concepts and focus on the prompts for the first important concept before breaking into small groups to complete the template. After the students completed the template, they were asked to discuss how they would transfer the information from the template to a lesson plan.

Results to Date/Implications

Overall, the introduction of the CoRe template has been positive to our teacher education program at Oregon State University from both the perspectives of teacher educators and preservice teachers. Teacher educators noted the benefits of using the CoRe template as a tool to discuss the practice of teaching and gain insight into the thought processes of the preservice teachers. Two instances of using the CoRe template was not sufficient for all the preservice teachers to fully understand or adopt when planning their lessons. The anecdotal findings align with research that states PCK is elusive and challenging to measure (Cooper, Loughran & Berry, 2015).

Feedback from the preservice teachers was wide-ranging. A few individuals remembered reviewing the CoRe template, but found it difficult to implement, “We went through it really quickly so it didn’t stick with me super well.” Others noted “…it took some guidance to really get started” and they weren’t a fan of the small boxes, but liked the prompts. For another group, the CoRe template became a tool they used when planning lessons during student teaching, helping them focus on what they wanted their students to know. This occurred especially with seeing the bigger picture of the course and with scaffolding information for students. One preservice teacher said, “I started using it in the last 4 weeks of student teaching and I really wish I used it the entire time.”

Future Plans/Advice to Others

We plan to continue to incorporate the CoRe template into the teacher preparation curriculum. Based on anecdotal evidence, prior research, and feedback, reviewing the CoRe template once or twice is not enough to truly make an impact. In the upcoming year, we plan to utilize the Core template in the curriculum design course and ensure we are providing content and guidance as preservice teachers work through how to break down content as they learn to teach. We encourage other teacher education programs to utilize the CoRe template with their student teachers, being sure to provide the why behind the use of the tool, modeling how it is used, and providing several opportunities for practice and application.

Costs/Resources Needed

There is no cost to implement the CoRe template in teacher preparation coursework, beyond course time. The template can be shared electronically or printed depending on need.

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Poster Type: Innovative

The Development of a State-Specific Web-Based Platform for the Curriculum for Agricultural Science Education (CASE)

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Introduction and Need for Innovation

The Curriculum for Agricultural Science Education (CASE) (2019) is a national agriculture curriculum that focuses on science integration and the use of inquiry-based instruction for school-based agricultural education (SBAE). To deliver this curriculum, teachers must complete an intensive professional development training that culminates in certification for one of ten agriculture courses (CASE, 2019). This curriculum is rigorous in nature, aligning with national standards for agriculture, English, science, and mathematics (CASE, 2019). Currently there are 1,828 teachers from 45 states utilizing the CASE curriculum, with many holding certifications for multiple CASE courses (CASE, 2019).

Over the last decade, CASE has continued to permeate the United States, and has most recently gained momentum in the Southwestern region. With the dramatic increase in teacher adoption in Arizona over the last three years, frequent questions regarding CASE certification and implementation have emerged. Historically the southwestern land grant institution has played a leading role in curriculum adoption and facilitation in Arizona, necessitating a centralized method of communication and dissemination of resources between the university and SBAE teachers. A recent master's thesis focused on the implementation of CASE in Arizona, yielded the recommendation of a centralized web-based platform that would enhance individual teacher's instruction and collaboration with other CASE certified teachers across the state (Bird, 2019).

To address this need, a state specific web-based platform has been developed. At the national level, CASE has an online website, case4learning.org, that contains a variety of resources for teachers including purchasing manuals, information on open institutes to achieve certification, state leader and CASE staff information, and outlines for the various CASE courses offered, among other resources (CASE, 2019). Despite frequent use of the national web-based platform, Arizona teachers desired an additional platform catered specifically to their unique needs, with resources tailored to Arizona that compliments national CASE resources.

How it Works

A web-based platform is currently housed within the University of Arizona Department of Agricultural Education, Technology and Innovatio website. This centralized location allows for teachers to easily access resources, communicate with state leaders and other CASE certified teachers in their districts, and includes external links to national CASE resources. This platform serves various audiences including veteran CASE teachers, newly certified CASE teachers, teachers considering certification, and school administrators and career and technical education directors. Set to go live on September 1, 2019, this platform will be treated as a living document that will be continually updated as new ideas and content from CASE emerges. A few of the resources that are already developed or in the process of development for the web-based platform include:

- Crosswalks for CASE lessons aligned with state technical agriculture standards, professional standards, and science standards
- Contact lists for Arizona CASE certified teachers and CASE state leaders
- Template letters to administrators for teachers seeking CASE certification
- Video tutorials filmed from student and teacher perspectives for a variety of lab equipment
- Grant and scholarship opportunities, both local and national
- Open and upcoming CASE institute offerings, including those within Arizona

- Course outlines for integration of lessons in compliance with CASE regulations and copyright laws

Because many useful resources already exist through the national CASE website, CASE staff has endorsed the use of their resources with links and clear credit given to the original platform (Chaplin, M. Personal Communication, June 26, 2019).

Results and Implications

Despite an increase in SBAE teacher adoption of the CASE curriculum, barriers to certification and implementation are still present. Two specific challenges identified by Arizona teachers were altering the lessons to fit their individual programs and curriculum and purchasing the necessary equipment to implement CASE (Bird, 2019). To address these concerns, we are currently developing a tips and tricks sheet from veteran CASE teachers for a variety of CASE lessons, have aligned three CASE courses with state standards, and are seeking additional monetary support for purchasing CASE equipment and supplies.

With a web-based platform accessible by any teacher in the state, CASE state leaders can more easily communicate with the teachers they serve. While we recognize that national CASE staff are highly responsive to inquiries from teachers nationwide, a connection with state leaders allows for more specific questions to be answered within the teacher's current context. This platform also enhances the role of the CASE state leader model, giving them a centralized mode of communication and a more effective way to support teachers utilizing the curriculum, all while strengthening the bridge between national CASE and state utilization of CASE. With a targeted audience that is not limited to already certified teachers, a collaborative environment is fostered between those already certified and those looking to become certified (Bird, 2019).

Future Plans

There has been an overwhelming amount of support expressed by Arizona agriculture teachers for this web-based platform. Many have contributed ideas to include that will help them in their individual classrooms and programs. One teacher commented on her excitement for the possibilities that this resource would bring to her teaching toolbox (Scibienski, A. Personal Communication, June 6, 2019). Given that teacher input that has already occurred non-formally, a formal needs assessment should be developed to determine additional resources and needs expressed by teachers. As the web-based platform continues to evolve, efforts should be made to determine if levels of access to materials, based on completed teacher certifications, should become a feature. This would allow for more specific conversations about individual lessons and assignments within CASE, while still adhering to copyright laws of CASE curriculum. This effort has the potential to be replicated in other states that have a similar need and is supported by national CASE staff.

Cost and Resources

The cost for this platform is minimal as it is currently in conjunction with the southwestern land grant university departmental website. Resources include personnel to manage and update information and respond to teacher inquires. Presently, CASE state leaders are taking the most active role in development and dissemination of content. However, should the platform develop to be larger scope, the responsibilities may shift to additional personnel and could result in additional costs.

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The Irrigation Association's Agriculture Faculty Academy: Addressing Complex Problems

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The Irrigation Association's Agriculture Faculty Academy: Addressing Complex Problems

Introduction

The American Association for Agricultural Education (AAAE) National Research Agenda identifies seven research priority areas (Roberts, Harder, & Brashears, 2016). Research Priority Area Seven is addressing complex problems; this area lists natural resource management as one of the five most pressing complex challenges stemming from global population growth. Water was identified as the most precious resource as well as the most pressing challenge that needs to be addressed within the natural resource category. Three research priority questions emerged from this research area, which include identifying methods, models, and programs that can prepare people to solve complex problems such as water conservation. Furthermore, how can teaching, research, and extension programs address water quality? Finally, how can formal and nonformal curriculum untangle complex issues like excessive ground water usage?

The Irrigation Association recognizes the issues related to water and has developed agriculture Faculty Academy as an innovative program to help secondary and post-secondary instructors learn more about irrigation using hands-on curriculum that can be incorporated into their classrooms. Agriculture Faculty Academy focuses on new and emerging technologies used in the irrigation industry to improve the efficiency of water use, while reducing ground water consumption with efficient irrigation. The purpose of agriculture Faculty Academy is aligned with the AAAE National Research Agenda Priority Area Seven.

How it Works

Agriculture Faculty Academy is an annual two-day conference that is open to instructors at high schools and post-secondary institutions. The conference provides instructors with the opportunity to gain new ideas for the classroom, network with fellow academics and get hands-on experience with irrigation-related curriculum. The two days are filled with lectures and labs, tours and a group dinner to encourage networking. The location changes annually so that educators can learn about the different irrigation methods that are used throughout the United States. Registration for the conference and application for the travel grant are completed online at www.irrigation.org/facultyacademy. Registrants are notified of their grant status a week following the registration deadline.

The 2019 Agriculture Faculty Academy included an interactive presentation on the nuts and bolts behind irrigation. The presentation focused on the basic concepts of agricultural irrigation techniques utilized in California. The second session was a hands-on irrigation hydraulic laboratory activity that emphasized Bernoulli's principle to calculate energy loss through friction. The third session was a laboratory exercise comparing microirrigation versus drip irrigation systems. The laboratory exercise placed heavy emphasis on plant water availability and water efficiency. The fifth session was a panel discussion composed of leaders with industry, extension, and association backgrounds that addressed a wide range of issues related to fruit and vegetable crop irrigation management. The sixth session was a tour of the Irrigation Training & Research Center (ITRC) on the Cal Poly, San Luis Obispo campus. The tour included several demonstrations that instructors could integrate into their curricula. The

final session focused on curriculum available for teachers to adopt. The session also included a laboratory activity where participants built demonstration models that can be utilized to teach drainage and salinity.

Results to Date

Agriculture Faculty Academy has hosted over 100 attendees since its inception in 2015. The attendance from year to year includes repeat attendees as well as first-time attendees. In 2019, the Irrigation Association hosted 19 attendees. Of the 19 attendees, there were three high school, 10 community college and six four-year university instructors. The Irrigation Association collects program evaluations from all of the participants at the end of the event. When asked to comment on their overall experience, one of the 2019 attendee said, “This has been a great experience to broaden my knowledge on irrigation”. Another attendee said, “The amount of mathematics associated with irrigation is eye-opening”. One of the repeat attendees said they: “Look forward to engaging in all of the hands-on learning that I can take back to my classroom”.

Future Plans/Advice to Others

Agriculture Faculty Academy is held each June. The location and date for the 2020 event will be announced late fall of this year. Registration and the travel grant request are expected to open in February. Registration for Faculty Academy will close during the first week of May. Recipients of the travel grant will be notified the second week of May and will receive the funding during the first week of June. A planning committee will meet four-six times throughout the year to identify topics and presenters for the next academy.

Water is a critical resource. Educators of students at all levels need to have up-to-date information to enthusiastically train their students on the use of efficient irrigation. As instructors are sharing irrigation knowledge and promoting careers in the field, they themselves need a network. Faculty Academy is a perfect group of like-minded instructors to create a networking group to share ideas and collaborate with one another. All instructors who attend find it a valuable use of their time. We recommend that educators assist the Irrigation Association by sharing Faculty Academy information with other educators who teach irrigation.

Costs/ Resources Needed

Agriculture Faculty Academy is free to attend, and the Irrigation Association offers travel grant assistance to qualifying attendees on a first come, first served basis. Preference is given to those whose institutions can contribute partially to expenses. The authors have participated in two of the agriculture faculty academies over the past three years and have received travel grants each year. The travel grant covers transportation, hotel, meals and other miscellaneous costs associated with attending the conference. The Irrigation Association awards the travel grants prior to the event in order to reduce financial burdens associated with travel. It should be noted that the participants typically receive several teaching aids and curriculum binders that may need to be shipped home if the participant is flying and does not have enough luggage space for the materials.

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POSTER TYPE: INNOVATIVE

This Poster Could Make Your Poster More Effective: Rethinking Scientific Poster Design

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Introduction/Need for Innovation

Traditional academic posters are important for disseminating ideas, sharing research, and fueling the scholarly work in a specific discipline (Ilic & Rowe, 2013). Many academic posters are designed in a fashion which actually inhibits the transfer of ideas from researcher to conference attendees (Forsythe, Wright, Scherb, & Gaspar, 2010; Rowe, 2015). Traditional poster designs are often wordy, and include more information than can be quickly consumed in the allotted time for a poster session at many conferences (Rowe & Ilic, 2015). In order to further the information transfer intended by the presentation of academic posters, Mike Morrison, a researcher at Michigan State University proposed a radical new poster design which may allow more efficient transfer of information on scholarly posters (Greenfeld-Boyce, 2019).

Undergraduate and graduate researchers, working in a combined research methods class at [Institution] came across the new academic poster design concept in the Spring of 2019, when they were assigned to view a Youtube explanation video posted by Mr. Morrison. Subsequently, we decided to present two research and one innovative poster at the National meeting of the American Association for Agricultural Education in the new format. The positive feedback from the presentation of these posters has changed our outlook on academic posters and led to much conversation about how and why we might change the way scholarly posters are presented in agricultural education.

How it Works

The new design functions with three sections. First, the author condenses the poster abstract to one main concept. The main concept is placed largely at the center of the poster, in font large enough to be viewed from 20-30 feet, the average distance most conference attendees view posters when walking through a poster session at a conference. In addition to the main concept, the center portion of the poster also includes a QR code, which can be used to direct viewers to the poster abstract, poster pdf file, additional resources, background information or any other information the presenter would like to communicate. Numerous QR Code makers are easily available online for no cost.

The left-hand sidebar on the poster is designed to include all of the information included on a traditional poster. The introduction, theoretical framework, supporting literature, and conclusions can all be consolidated into bullets and placed in the left side bar section. Mr. Morrison called this section the “silent presenter” bar, and noted that the information should be complete enough for someone to gather the details about the study if the presenter is occupied by another interested attendee. The right-hand sidebar poster is reserved for information needed by the presenter to highlight and validate the main concept. This would include tables, graphs, instrument components, or any other things which could supplement the discussion between the poster presenter and an interested conference attendee. Mr. Morrison called this section the “ammo bar” and suggested using this information to help guide the conversation when someone approaches the poster.

The revised poster format is shown in Figure 1, which highlights the main concept (center) along with the silent presenter bar (left) and ammo bar (right).

Figure 1. Reinvented poster design suggested by Morrison (2019).

Results to Date/Implications

We presented three posters using a slightly modified version of this design at the AAAE Annual Conference in May 2019. As researchers, we found the design required us to truly examine the information we wanted to communicate, which was invaluable for student researchers, and required better preparation as we considered which items would be helpful to embed in the QR Code link. We spent less time worrying about design, and more time thinking about how our ideas could be communicated clearly. As presenters, we noted more visitors at our posters than previous conferences, and an increase in acknowledgement from those passing by. Many who did not approach for a conversation nodded or read the main concepts from our posters. Attendees of the AAAE conference visited our QR codes on average 27 times per poster, and a link shared to describe the new poster design was visited by 38 unique visitors.

Future Plans/Advice to Others

We plan to continue to present our posters using the new poster design, as we believe it more clearly helps us communicate findings to a larger percentage of the attendees at an academic conference. There are five posters being presented in this format at an upcoming student research conference in July 2019. Some important considerations for others include the increased time and thought to develop the main concept for the poster. We recommend allowing presenters to receive multiple sources of feedback from others about the specific wording for the main concept, and increase the amount of preparation time in order to be more ready to have in-depth conversations at the poster session based on increased interest.

Costs/Resources Needed

One of the best things about this design is that there is no cost above the traditional cost of printing a poster. Only Microsoft Powerpoint and a free online QR Code maker are required.

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Throw What You Know:
Encouraging Student Learning Ownership by Introducing Knowledge Management

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Introduction/ Need for Idea

People have an inborn desire to maintain control over their internal and external environments so as to best facilitate interest, enjoyment, and satisfaction (Ryan & Deci, 2000). In the classroom, learning ownership is the ability of students to exercise some of such control in terms of the organizational, procedural, and cognitive aspects of their coursework (Stefanou, Perencevich, DiCintio, & Turner, 2004). Allowing students to have more autonomy has been linked to student perception of the course and amount learned (Demir, Burton, & Dunbar, 2019).

Knowledge management is an organizational necessity, defined as, "the process of creating, sharing, using and managing the knowledge and information of an organization" (Girard & Girard, 2015, p. 14). A familiarity with knowledge management and how to contribute to it is important so students may be prepared to participate in complex work environments characterized by globalization, doing more with less, turnover, and technological advancements (Dalkir, 2013).

In an effort to give students more agency over their learning and introduce them to knowledge management, those enrolled in a non-major, writing-intensive, agricultural communications course at [university] were required to complete a "how-to" assignment regarding a topic of their own expertise and submit it in either audio, video, or text format.

How It Works

Students were given an assignment requiring they choose an interesting and technical skill or task not commonly known to the general public and give simple, step-by-step directions for completing it. Students were also allowed to choose the submission type as this "How-To" assignment could be completed in the form of an audio recording, video, or text with supplemental images.

During the class session one week prior to the due date, the instructor reviewed the assignment task sheet and rubric with the students in attendance. In a subsequent class session, the instructor allowed time for the students to think, pair, share with their classmates regarding ideas for their how-to topic. If they wanted to, students were able to ask questions and confirm their how-to topic with the instructor before, during or after class, or during office hours. Lectures supplementing the assignment covered the topics of audience analysis, giving directions, and knowledge management. Students submitted their assignment via Blackboard.

Results to Date/ Implications

How-to topics ranged widely, including how to hook up a trailer, calculate the grade of a T-bone steak, use a tensiometer, move cattle in a low stress manner, and several examples of student's specialty recipes. Of the 86 students who submitted the assignment, 66 chose text submission, 10 chose video, and 10 chose audio.

In order to evaluate students' perceptions of the how-to assignment, students were asked via a Qualtrics questionnaire: "Did you like having the freedom to choose the way you presented your how-to, either my video, audio, or text? Why or Why not?"

"Allowed creativity to flow."

Creativity was a common theme among student responses. One student specifically reported, "The ability to choose allowed creativity to flow." As the course was writing-intensive, this assignment gave students an opportunity to practice their communication skills in a different manner. "It was something new and gave us a break from writing, and allowed us to be more creative," one student stated. Giving students opportunities to take ownership of the assignment encouraged buy-in. For example, one student reported, "I liked having the ability to choose our topics because I feel like when I am given more creative liberty in my assignments, I am more interested in them."

"I know my strengths."

The how-to assignment allowed the student to play to their strengths in terms of topic selection and type of submission. Several students provided statements along the same lines such as, "I liked being able choose the way I completed the assignment, because I know my strengths." Students reported appreciating having options to execute the assignment because "leaving it open meant that we could choose something that we had a better chance of getting a higher grade on."

"Can be a little stressful."

Giving students responsibility for defining portions of the assignment was positively received overall, but some students conveyed the feeling, "sometimes that can be a little stressful because I'm kind of out of practice thinking in that way since all of my classes usually have strict, defined criteria/guidelines for how they want our work." The opportunity to make decisions about how they would complete their assignment was unfamiliar territory for some students, as they indicated statements similar to, "most classes don't offer that level of freedom in assignments."

Advice to Others

Instructors who choose to integrate this assignment into their coursework should consider reviewing examples of each how-to submission type during class time. This may make audio and video formats more approachable to complete. Some students were uncomfortable when first faced with an assignment where they had so much freedom to choose their topic and submission type. It is recommended instructors reserve some class time to have students brainstorm ideas among themselves and be able to confirm their idea with the instructor. It is imperative that the instructor be very clear about the originality requirements of the assignments, meaning all text, photos, audio, and video should be created by the student. It is recommended that the instructor require the student to upload their assignment to an online file management platform, such as OneDrive or Dropbox, then share the link to the file with the instructor via Blackboard or email. This allows large files to be easily transferred.

Costs/ Resources Needed

This assignment can be executed at no cost to the instructor or students. Each student will need to be supplied with the assignment requirements, preferably in rubric form, by way of hard copy or electronic form. Depending on which type of submission students choose, they will need either word processing software and a camera, an audio recording device, or a video camera. Smart phones will suffice for photo, audio and video recording. Students will need to submit their assignment via an electronic format chosen by the instructor.

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Turn out the Lights: Using Night Photography to Teach Exposure to ACOM Students

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Turn out the Lights: Using Night Photography to Teach Exposure to ACOM Students

Introduction/Need for Idea

As more emphasis is placed on the value of developing students' visual communication skills, photography has become a common course offering in agricultural communications programs (Cannon, Buck, & Specht, 2016; Morgan, 2012; Terry & Bailey-Evans, 1995). Further, the use of innovative instructional methods in photography courses can improve students' creativity (Kennedy & Akers, 2018) and understanding of camera functions, including exposure (Anchell, 2015). Once undergraduate students learn the basic skills, photography teaches them to think critically, independently, and creatively (Bogre, 2014). A two-week "Maymester" photography course is offered as part of the ACOM undergraduate program at Texas Tech University. The entry-level, field-based course focuses on teaching students the basics of exposure and camera operations, while introducing them to concepts of composition and storytelling. Most students enter the course with little to no knowledge of how to operate a camera in manual mode. The course uses a variety of experiential instructional methods, including night photography, to enhance students' understanding of key photographic competencies like exposure. Night photography involves the use of specific photography equipment and an understanding of how to manipulate exposure on a digital single lens reflex (DSLR) camera. The production of quality long exposures at night requires students to learn how to incorporate different light sources into the image, which can make them a better photographer (Biderman & Cooper, 2013). This innovative idea is the use of a challenging night photography experiential learning activity to teach exposure concepts at the beginning of an entry-level agricultural communications photography course.

How It Works

During the first two days of the two-week semester, students received introductory lectures in the classroom about the basics of exposure (shutter speed, ISO, and aperture) to learn about their camera's main functions. The night photography activity occurred in two phases on the third day of class: (1) an in-class session where techniques were discussed and long exposure photograph examples were shown, and (2) a field outing to a farm where students could practice night photography. A farm located within a 30-minute drive from the Texas Tech campus was identified as the location for the night photography outing. In the days leading up to the outing, students were given an equipment list that included their camera, lenses, tripod, shutter release remote, and charged camera battery. Students were also encouraged to bring camping chairs, flashlights, proper outerwear, and snacks to aid with the waiting period between exposures. Students met on campus two hours before sunset and carpooled to the farm. Once at the farm, students were asked to set up their camera equipment and get familiar with their surroundings before sunset. Farm equipment, including a spray rig, a tractor, and an antique combine, served as subjects for the long exposures. During the long exposure activity, students were instructed to set their cameras to specific exposure settings, which required them gain familiarity with their camera's menu, ISO, aperture, and shutter speed functions. The different agricultural subjects set up on the farm were light painted by the instructor while the students captured long exposures. Students each had to make the manual adjustments to their camera settings. A variety of exposure settings were given to students throughout the evening to illustrate how different settings produce different results. Back in the classroom, students were asked to critique their work. At the end of the two-week semester, students provided written feedback about their experiences during the night photography outing.

Results to Date/Implications

While many students admitted the night photography outing was challenging, most found this initial field experience to be beneficial to their overall understanding of exposure. One student said she learned the most during the night photography outing and noted it was helpful to have had the experience early in the course. Other students said night photography pushed them to learn their cameras and its functions. None of the students in the class had any previous experience with creating long exposures. One student said, "I really didn't know anything about my camera going into it, but by the end of the night, I was start to feel confident in how to use my camera." Another student said the night photography activity helped them better understand how light can be used in a photo. One student admitted they had no idea what they were doing at the beginning of the night. "I could not get my settings right, and all of my pictures were very grainy. But I loved doing this. I definitely learned a lot about my camera and light during this experience." Another student noted, "This outing was a little challenging in the beginning due to a lack of knowledge of my camera, but it helped me learn a lot." Despite the positive feedback, some students said the wait-and-see elements of long exposures took too long. One student said, "The night outing was hard for me. I just don't have the patience for it." In addition to grasping the concepts of exposure, students also discussed how the night photography outing helped them understand the value of quality equipment. Some students said they "went too cheap" when buying a tripod, and the activity taught them the importance of sturdy equipment.

Future Plans/Advice for Others

The use of an experiential night photography outing in an entry-level digital photography course does encourage a quicker understanding of exposure settings and camera functions. Night photography will continue to be used in the course as a field experience. Providing an equipment list at the beginning of the course is important to give students plenty of time to acquire the different camera items needed for the outing. Instructors should place a specific emphasis on the importance of a sturdy tripod. Cheap, lightweight tripods will not hold a DSLR camera securely, especially in windy conditions. Another piece of equipment that has repeatedly caused confusion is the shutter release remote. This device helps photographers more easily make long exposures in the camera's "bulb" mode. However, shutter release remotes must be compatible with the student's camera. While making students purchase accessories that were compatible with their cameras was a good learning experience, many chose to buy cheap, generic remotes that rarely work with their camera model. Instructors should provide students with links to remotes that have been proven to work with common camera models, such as the Canon Rebel.

Costs/Resources Needed

In this course, students are responsible for purchasing their own cameras, lenses, and other needed accessories, including a tripod and shutter release remote. The typical entry-level DSLR camera can range in cost between $400-$700. Because photography and videography are an important part of the ACOM degree program, purchasing a DSLR camera is considered a necessary expense for the discipline. This activity can take place in any setting where there is little light pollution, however, establishing a relationship with a landowner in a location away from city lights is helpful when organizing an effective night photography outing in an agricultural setting. Adobe Lightroom Classic software was used in the classroom to manage image workflow and editing. An Adobe Creative Cloud subscription is $19.95 per month for students.

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Using 360 VR to Relive an International Experience

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Using 360 VR to Relive an International Experience

Introduction

There are many benefits associated with students completing a study abroad experience. As the world becomes more globally connected, students will need to be equipped with the skills to connect and engage with international audiences (Doyle et al., 2010). Students become more globally-minded and can significantly increase their intercultural sensitivity by completing a study abroad experience (Clarke III, Flaherty, Wright, & McMillen, 2009). However, many barriers also exist for students to be able to participate in these programs. While student apprehension to explore a foreign country may prevent participation in study abroad programs, the cost is the most frequently cited barrier to participation (Doyle et al., 2010).

While it is difficult to remove all financial barriers associated with study abroad programs, technology may be able to bridge these divides. Virtual Reality (VR) experiences are able to elicit emotions from users and has been called an empathy machine (Constine, 2015). Specifically, 360-degree VR may be able to ease students' apprehension and offer a vicarious international experience. With the rapid advancement of camera technology, creating a 360 VR experience is becoming more mainstream. One simply needs a 360-degree camera and minimal editing software to do so. 360-degree cameras capture a complete spherical image/video of the environment it is placed in. Could this technology be used to relive an international experience and recruit students to participate in future study abroad programs?

How it Works

A student participating in a two-week study abroad course traveling to Namibia was trained on how to use a GoPro Fusion, a 360-degree camera. The student captured various 360 photographs and video assets to be packaged into a 360 VR tour and 360 video experience for reflection purposes and to recruit future participants. Various 360 images were packaged into a VR tour with Google Tour Creator, a free VR tour building platform. Selected 360-degree videos were edited with Fusion Studio and uploaded to a YouTube channel. A QR code was created for the VR Tour and for the YouTube playlist, printed on labels, and attached to a Google Cardboard headset. The QR code can be scanned with a smartphone and then viewed inside the Google Cardboard headset, providing a sense of presence in the international setting. Additionally, the 360 photographs and videos were loaded on an Oculus Go, a standalone virtual reality head-mounted display (HMD), for viewing and a heightened sense of presence not achievable with the Google Cardboard.

Results to Date/Implications

To date, 40 individuals have participated in the Namibia 360 VR experience. Students and stakeholders who viewed the 360 footage have had a positive reaction. Students who participated in the actual program noted a strong sense of being transported back to the remote village in Namibia. Seeing part of the experience in the immersive viewer allowed them to be present in the environment and relive their experience. Students who did not participate in the actual trip noted the feeling of presence in the village and could “actually see themselves in Namibia.” Several mentioned wanting to attend the next study abroad program as a result of the Namibia 360 VR experience. Potential study abroad students noted the cultural immersion and blending

between the native peoples and the study abroad students. Viewers appreciated the 360-degree footage as it allowed them to see the main activity in the video, and also the entire surroundings and villagers' reactions.

Students also noted Google Cardboard's ease of use, and transformation of the video. Viewers stated experiencing the video in a Google Cardboard VR viewer was a more immersive experience than the traditional handheld video viewing experience. The lenses within the cardboard and subsequent movement around the video in tandem with the viewer's head movements enhanced the overall experience.

Future Plans & Advice to Others

The AggieXR Lab, in partnership with the College of Agriculture and Life Science study abroad office at Texas A&M, is working on a 360 VR repository of international experiences. This repository will be used to showcase study abroad programs to stakeholders, recruit students to participate, and as a reflection tool for study abroad completers. Prior to developing a similar program, it is advised that individuals spend time learning about 360 VR production and postproduction. This will assist in designing engaging 360 VR experiences. We recommend reaching out to the study abroad office at your institution as they may have resources to assist in the development of a similar program.

The 360-degree video can be used to promote and recruit for study abroad programs. Past recruitment for the study abroad program used traditional video and photography. The dimension and immersion into a past study abroad experience allows potential participants to gain better insight into their future experience. Students, as a result of viewing the 360 experience, can better place themselves into the study abroad situation that is foreign to them. This can not only increase excitement but also ease the nerves of students who may have never traveled previously. Lack of travel experience and fears associated with foreign countries are common concerns expressed by students that prevent them from considering study abroad opportunities. Immersion in a study abroad experience through 360-video may assist students in overcoming these concerns or can be used as a substitution for actual international experience.

Additionally, these 360 VR experiences may excite and encourage student participation in study abroad programs. Students with various study abroad destination options may also use these 360 VR experiences in their decision-making process. The 360 VR experiences can provide students with vicarious experiences and allow them to see themselves in that particular location.

Costs

All the equipment used for this project was readily available through the AggieXR Lab at Texas A&M. The specific technology used for this project included a GoPro Fusion ($299), Fusion Studio (included with the camera), Google Cardboard ($2.50 each), and the 64GB Oculus Go VR HMD ($250). There are other 360-degree cameras (e.g., Samsung Gear 360, Insta360 Nano) on the market that are lower in cost. There are also several options for affordable VR viewers as well. Time is an important consideration when developing a similar project. For this project, roughly two hours were dedicated to editing the footage for the Namibia 360 VR experience.

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Using Qualtrics to Monitor Student Teacher Progress

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Using Qualtrics to Monitor Student Teacher Progress

Introduction/Need for Innovation

The student teaching process is a capstone experience for agricultural education students (Myers & Dyer, 2004; Smalley, Retallick, & Paulsen, 2015) that causes change within the student (Smith & Rayfield, 2017). The quality of the student teaching process has implications for the profession. According to Fives, Hammon, and Olivarez (2007), high workload placed on student teachers may be causing early burnout in student teachers, ultimately impacting their decision to enter the field. Torres and Ulmer (2007) and later Robinson, Krysher, Haynes, and Edwards (2010) identified different areas student teachers spend their time related to classroom instruction. Many of these areas align with activities found to be important to student teachers as determined in a study by Paulsen, Smalley, and Retallick (2016).

In order to monitor activities and attempt to identify when changes take place during student teaching, [University] has their student teachers complete weekly reports summarizing activities taking place during the experience and reporting time spent doing various agricultural education teacher responsibilities identified in previous studies (Torres & Ulmer, 2007; Robinson, Krysher, Haynes, & Edwards, 2010; Paulsen, Smalley, & Retallick, 2016). For the past two years, student teachers in the 2017 (n = 15) and 2018 (n = 21) student teaching cohorts were writing weekly reports and emailing it to their university supervisor. This resulted in a large amount of work to compile and analyze the data. In order to continue this programmatic evaluation, a more efficient method was needed for data collection. The use of a weekly Qualtrics™ survey was employed for the 2019 (n = 22) student teaching cohort to improve the data collection process and improve accuracy. This form of programmatic evaluation could easily be used by other teacher preparation programs across the country to track progress of their own student teachers.

Methodology/How it Works/Program Phases

In order to collect programmatic data on the student teachers a Qualtrics™ survey was designed. There are two questions for each week day and for the weekend. The first question is open ended asking for a brief summary of the events of the day. This gives the opportunity for supervisors to see good things or any problems that may be happening. The second question asks student teachers to quantify their time spent doing the following activities: observing their cooperating teacher, conference time with cooperating teacher, preparation for instruction, classroom and laboratory teaching, grading student work, administrative duties related to program management, professional activities and meetings, SAE observation, FFA activities on the local level, FFA activities on the district, area, and state level, CDE preparation, adult education, and time off. A sliding bar is used for each of the categories with a maximum of 24 hours set for each week day. The constant sum setting in Qualtrics™ that will limit the maximum value to 24 hours helps to ensure accuracy of reported time. The survey is designed where student teachers can access it online daily and submit it at the conclusion of the week.

The online Qualtrics™ survey is distributed on Monday during each week of the student teaching process. The Qualtrics™ survey software is used to distribute the survey through the students' university email. A reminder email is sent through Qualtrics™ on Sunday afternoon to ensure all students on the cohort complete the survey. A new survey is made from the original

for each week using the copy feature in Qualtrics™ and is distributed using the same procedures. Once all responses have been recorded in Qualtrics™, the data is easily exported into an Excel spreadsheet where it can be analyzed and distributed to all university supervisors.

Results to Date/Implications

To date all student teachers from the 2019 student teaching cohort (n = 22) have recorded 17 weeks of data using the online Qualtrics™ survey. It has provided an organized set of data that is easily analyzed in Microsoft Excel and could be easily imported into SPSS for further analysis. The reports generated weekly from Qualtrics™ has allowed the university supervisors to monitor student teacher successes and difficulties. It has also been valuable in providing a way for students to accurately report time spent in the various responsibilities of a student teacher in agricultural education. The functions in Qualtrics™ that provide a check by allowing a maximum of 24 hours to be reported in a day forces the students to report accurate times. The time off is reported on each day to ensure times in all categories will total to 24 hours.

One of the implications of using the Qualtrics™ survey is a consistent way of collecting programmatic data on student teachers that can be employed each year in the future. Reports exported from Qualtrics™ provides workable data on demand for university supervisors to analyze. The data collected from this online survey has provided a way to see how student teachers spend their time throughout the experience and how time spent changes as they progress.

Future Plans/Advice to Others

Based on the results of using Qualtrics™ to collect programmatic data on student teachers, our program will continue to use this survey software to monitor student teacher progress. We plan on expanding the amount of data collected during the student teaching progress by asking students to rate their efficacy in the different areas of agricultural education teacher responsibilities as well as monitor how their intention to teach changes throughout the process.

Advice to others would be to explain the purpose of the data collection to student teachers before they leave to work in their cooperating centers. While the design of the survey is easy for student teachers to use, explanation as to what activities constitute each category provided may be helpful for the student teachers. It is also helpful to make the student teacher weekly reports a course requirement to ensure their completion and accuracy.

Costs/Resources Needed

The cost of using the Qualtrics™ online survey software was free to our department. A fee for using the software is paid for by the College of Agriculture. Other free online survey software could be used for the same purpose such as SurveyMonkey®. A computer with Microsoft Excel and an internet connection is needed. A person to monitor the data collection process is necessary with a total time of approximately 15 minutes per week needed to check on response rates, export the data, and create reports.

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What'll Be? Using an Assignment Menu in an ACOM Publications Course

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What'll Be? Using an Assignment Menu in an ACOM Publications Course

Introduction/Need for Idea

Magazine production is a popular experiential capstone-level course taught in 11 agricultural programs nationwide (Cannon, Buck, & Specht, 2016) and is often viewed by students as essential for rounding out their educational experiences (Sitton, 2001) and preparing them for their careers (Rhoades, Miller, & Edgar, 2012). These courses focus on writing, layout and design, and photography, while encouraging students to apply the skills discovered through experiences in their degree program and, ultimately, publish and circulate a magazine (Rushing, Miller, Edgar, & Cox, 2014). Texas Tech University teaches a senior-level publication course as part of its capstone ACOM block course structure. Students in the course produce *The Agriculturist* magazine from start to finish, including writing the stories, photographing subjects, proofing and editing content, and selling advertising. During the spring 2019 semester, 51 students were enrolled in the publication development course. This larger-than-normal class presented logistical challenges when considering how the normal assignment structure would be implemented. All previous issues of the magazine required each student to meet with their beat contact, develop story ideas and a list of sources, interview the sources, write a two-page feature, provide supplemental photographs and graphics, and sell a minimum of one page of advertising. The large class size outnumbered the available beat contacts on campus and in local industry, creating the need to rethink the assignment structure for the course. This innovative idea was the development and use of a unique assignment structure to provide diverse content in the publication, while providing students with a valuable learning experience.

How it Works

A new assignment structure was developed that allowed students to specialize in a specific skills area – writing, photography, or advertising – when completing the major assignments in the magazine course. This new structure, referred to as the "Assignment Menu" by the course instructor, had four options: (1) the Writer's Special, which focused heavily on writing with a photography component and no advertising sales responsibilities; (2) the Jack/Jane of All Trades, which had balanced writing, photography, and advertising sales responsibilities; (3) Picture Perfect, which required visual storytelling through photography, a small writing piece, and one-page of advertising sales; and (4) Salesmen's Delight, which focused heavily on advertising sales (two pages required) with a small writing and photography requirement. A predetermined number of positions were allotted for each of the assignment options based on the number of enrolled students. Although each assignment had a unique focus, all assignments were worth the same amount of points with writing, photography, and advertising sales weighted proportionately to the assignment's purpose. While not every assignment had an advertising sales component, each required students to work with a beat contact to develop story ideas from which they would produce written and photographic work. Rubrics for each of the assignment formats were provided to students at the beginning of the semester. During the first week of class, students completed an application template for the assignment segment area of their choice. The application template required students to provide reasoning for why they were best qualified for the position, while identifying experience with that skill. Students had the option of providing supplemental materials to support their qualifications. The course instructor made the final decision on how assignments were awarded among the students. Once positions were assigned, students began working with beat contacts to develop story ideas and identify sources. Because the number of students outnumbered the regular beat contacts, groups of two to three

students representing different assignment options were divided among the beats. This ensured content diversity in how each beat/topic was covered. Students then completed their assignments according to each menu option's guidelines. The student-led editorial team selected the best articles from each of the menu options to be featured in the magazine's print edition. At the end of the course, students provided feedback regarding the new assignment process during a class discussion.

Results to Date/Implications

Overall, students in the course had positive feedback regarding the assignment structure. Students appreciated the opportunity to specialize in the communications areas they were strongest in while having some ownership in how they would contribute to the magazine. A student who completed the Picture Perfect assignment said, "I am not the best writer, nor am I the best salesman; however, I love taking pictures. I loved having the opportunity to choose." Students said the structure allowed them to focus on the elements they were most passionate about while getting experience in other areas. A student who served on the magazine's editorial staff suggested the menu options improved the quality of the magazine: "The menu produced artful stories and images the entire staff was proud of instead of just assignments everyone was required to turn in." Despite not requiring all students to sell advertising, there were still 51 pages of ads sold, which allowed for a 124-page issue – the largest yet. A few students said the menu options provided new content variety in the magazine, which had followed the same story structure for many years. One student said the menu "enabled each student to contribute their very best efforts and talents to the magazine's construction, which allowed for much-needed diversity" in the publication. The increased class size and larger sales expectations for the Salesman's Delight assignment did place pressure on existing advertising clients. Some students admitted the two-page sales requirement was harder than they expected, while others were grateful for the lighter writing responsibilities.

Future Plans/Advice for Others

This new assignment structure will continue to be used going forward in the magazine production course at Texas Tech. The positive student feedback played an important role in this decision, but feedback will also be sought from the readership regarding the new diversity in article format, i.e., visual storytelling, college profiles, long features, etc. A clear rubric system for each segment was important to the success of the new structure. Because each assignment option weighted the three specific elements (writing, photography, and advertising) differently, giving students a clear understanding of how points would be awarded was a critical component of the new structure. Going forward, class enrollment should be considered when determining the number of positions for each "menu" option.

Costs/Resources Needed

All writing assignments were submitted using Microsoft Word, which is provided free to students through their university account. The magazine course utilizes Adobe Creative Cloud software for its production. Students submitted image contact sheets using Lightroom, and layout designs were produced using InDesign, Photoshop, and Illustrator. Students have access to monthly Adobe CC subscriptions for $19.95. *The Agriculturist* is printed and mailed using funds from advertising sales. Based on ad sales and printing costs from previous issues, the new structure likely did not provide a cost savings for producing the magazine.

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Research Poster Abstracts

A Longitudinal Study on the Impact of Time Spent Student Teaching on the Decision to Enter the Field

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A Longitudinal Study on the Impact of Time Spent Student Teaching on the Decision to Enter the Field

Introduction/Theoretical Framework

The shortage of qualified teachers to fill secondary agricultural education vacancies has been identified as one of the most pressing issues in our field (Myers, Dyer, and Washburn, 2005). According to Camp, Broyles, and Skelton (2002), the shortage of teachers in the field is caused by teachers leaving the early in their career and programs at colleges and universities failing to graduate a sufficient number of qualified individuals to fill the open positions. However, Parmley, Bowen, and Warmbrod (1979) concluded the teacher shortage was not caused by universities failing to graduate enough qualified students, but rather by a low percentage of graduates who enter the field.

Fives, Hamman, and Oliverez (2007) suggested high workloads placed on student teachers may be impacting their decision to enter the profession by creating early burnout. However, others have reported teachers with higher perceived self-efficacy levels had reduced intention to leave the classroom and a higher level of commitment to the profession (Blackburn & Robinson, 2008; Walker, Garten, & Kitchel, 2004). Student teaching is a real-world, high impact experience where prospective teachers begin to develop self-efficacy in teaching (Smith & Rayfield, 2017). The impact time investment has on the decision to leave or remain in the field of agricultural education and the impact the student teaching experience has on self-efficacy can be examined through a lens of Bandura's Self-Efficacy Theory (Bandura, 1986). Using Bandura's theory of self-efficacy, the experiences student teachers have during student teaching influence their level of self-efficacy and lead to a behavior or the decision to enter the field. The purpose of this study was to determine the relationship between time spent during student teaching and the decision to enter the field of agricultural education as a secondary agricultural education teacher.

Methods

This study was conducted as a longitudinal study over three years using data from the spring 2017 (n = 15), spring 2018 (n = 21), and spring 2019 (n = 22) student teaching cohorts at [University]. Weekly reports asked student teachers to quantify time spent during student teaching based on an instrument developed by Torres and Ulmer (2007). Hours were reported in the following areas: 1) Observing Cooperating Teacher, 2) Conferencing with Cooperating Teacher, 3) Preparation for Instruction, 4) Classroom/Laboratory Teaching, 5) Laboratory Preparation and/or Maintenance, 6) Grading/Scoring Students' Work, 7) Administrative Duties (Program Management), 8) Professional Activities (Meeting, In-service), 9) SAE Observations and Livestock Shows, 10) Local FFA Activities, 11) District, Area, and State FFA Activities, 12) CDE Preparation, and 13) Adult Education. Student teachers from these cohorts submitted weekly reports to their university supervisor over a 15-week period using a Qualtrics questionnaire. Teaching decision status was determined by checking the state agricultural teacher directory or through direct contact with the individual. Data from all student teachers in the three cohorts (N = 58) were compiled in IBM SPSS version 25.0 where Pearson point-biserial correlations were calculated.

Findings

The purpose of this study was to determine the relationship between time spent during student teaching and the decision to enter the field of agricultural education as a secondary agricultural education teacher. Grading/scoring students' work (r_{pb} = -.30) was the only category with a moderate relationship (Davis, 1971). The remaining categories were either low or negligible relationships. A complete list of correlation coefficients for time spent student teaching and the decision to teach is presented in Table 1.

Table 1

Relationships Between Time Spent Student Teaching and Decision to Teach (N = 58)

Student Teaching Time Category	Teaching Decision (r_{pb})
Grading/Scoring Students' Work	-.30
Overall Total Hours Spent Student Teaching	.20
Professional Activities (Meetings, In-Service)	.19
FFA Activities – Local Level	.19
Laboratory Preparation and/or Maintenance	.14
SAE Observations and Recording (Including Livestock Shows)	.11
CDE Preparation	.09
Adult Education	.09
Conference Time with Cooperating Teacher	.08
Administrative Duties – Program Management	.08
FFA Activities – District, Area, and/or State Level	.06
Classroom/Laboratory Teaching	.06
Preparation for Instruction	-.05
Observing Cooperating Teacher	-.01

Note. Decision to teach coding: Decision not to teach = 0, Decision to teach = 1.

Conclusions/Implications/Recommendations

From the findings of this study, conclusions can be drawn about time spent in the student teaching experience and the decision to enter the field. When comparing the relationship of time spent student teaching and the decision to enter the field, all categories except grading/scoring student work had a low to negligible correlation. Given this information, it can be concluded time spent in the student teaching process did not relate to the student teachers' decision to enter the profession. This contradicts the work of Fives, Hamman, and Olivarez (2007) that suggested high hours experienced in the student teaching process is leading to early burnout of student teachers. If the quantity of hours spent student teaching does not relate to the decision to teach, would it not be best for student teachers to receive the most experience possible during their student teaching program? This leads to the recommendation that teacher educators should encourage their students to engage in as many activities as possible during their student teaching experience so the students will have the opportunity to gain the most knowledge and experience. Further research should be conducted gathering self-efficacy information from student teachers during their student teaching experience to determine if there is a relationship with time spent in student teaching activities and levels of self-efficacy.

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Agricultural Educators' Adoption of Inquiry-Based Learning: The Effect of Beliefs about Education, Self, and Context

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Agricultural Educators' Adoption of Inquiry-Based Learning: The Effect of Beliefs about Education, Self, and Context

Introduction

Agricultural education courses offer the opportunity for enhanced science learning (Theriot & Kotrlik, 2009). Inquiry-based learning (IBL) has the ability to further increase students' research skills, scientific thinking, and reasoning abilities (Batdi, Semerci, & Aslan, 2018; Gormally, Brickman, Hallar, & Armstrong, 2009). However, the adoption of IBL in the agricultural classroom has not been widely researched. Priority area four of the National Research Agenda for the American Association for Agricultural Education states, "Enhanced understanding of learning and teaching environments could result in the development of present-day best practices and research-based pedagogies and technologies that not only meet the goal of agricultural education but also society's greatest challenges" (Roberts, Harder, & Brashears, 2016, p. 39).

Examination of literature demonstrated need for further research to be conducted to determine hindrances to adopting inquiry-based learning in the agricultural classroom. One hindrance to IBL is teachers' need for support and mentorship when implementing IBL (Liu, Lee, & Linn, 2010). Gaining a better understanding of the variables that can impact agricultural educators' adoption of IBL can improve professional development. Voet and De Wever (2018) developed a framework of beliefs concerning the adoption of IBL in regard to history teachers. Their framework posits that teachers' beliefs about education, self, and context impact their adoption of IBL in the classroom. The authors posited that their framework could be utilized in additional domains and thus, the framework was adapted as the theoretical basis for this study.

Purpose and Methods

The purpose was to examine the belief system of agricultural educators about agricultural education, self, and context in regard to their adoption of IBL. The objective addressed was to determine how agricultural educators' beliefs about agricultural education, self, and context of agricultural education influenced their adoption of IBL. The target population was agricultural educators who were active members of the National Association of Agricultural Educators (N=7800) in 2018. Based on the research of Krejcie and Morgan (1970), we determined a sample size of 367 teachers would be appropriate. Recruitment emails were sent to 1673 members, representing the six NAAE regions. The final number of useable respondents was 410.

The instrument developed by Voet and De Wever (2018) was adapted for this study. Data were collected from members of the NAAE using a five-contact e-mail strategy, as suggested by Dillman, Smyth, and Christian (2014). Non-response errors were handled according to the method recommended by Lindner, Murphy, and Briers (2001) with no significant differences found. The quality of the questionnaire was determined through factor analysis and subsequent measures of internal consistency of the resulting scales. Likert scales were used to examine how teachers' beliefs influence the adoption of IBL. Pearson's product moment correlations were used to derive coefficients to describe the relationship between the adoption of IBL, nature of knowledge, orientation to teach substantive knowledge, orientation to teach procedural knowledge, self-efficacy, perceived student ability, and perceived contextual hindrances. Further, based on the entire sample (n = 410), SPSS AMOS 24 was used to estimate a structural equation model (SEM). The model contained 44 distinct sample moments, 28 distinct parameters for estimation creating 16 degrees of freedom which met the requirements for SEM (Bowen & Guo,

2012; Ullman, 2013). Following the cutoff criteria by Hu and Bentler (1999), the results of the analysis indicate a good fit: CFI = .97. The root mean square error of approximation indicated a reasonable fit (RMSEA = .07, CI [.04, .09]).

Findings

Respondents represented all six NAAE regions. The absolute fit of the model was statistically significant (^{2} = 31.28, df = 11, p = .001), which means these data did not have absolute fit for the model. Therefore, researchers used the relative fit of the model which was acceptable (Hu & Bentler, 1999). The fit indices (CFI = .97; RMSEA = .07) indicated the final model met the criteria for model evaluation (Blunch, 2013; Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999). Together, the six predictors (nature of knowledge (NKO), orientation to teach substantive knowledge (OTS), procedural knowledge (OTP), self-efficacy (SEF), perceived student ability, (PSA) and perceived contextual hindrances (PCH)) accounted for 26.5 percent of the variance in the adoption of IBL. Orientation to teaching procedural knowledge and self-efficacy had significant effects on agricultural educators' adoption of IBL. Teachers' self-efficacy in regard to utilizing IBL was most influential and had a positive effect on their adoption of IBL (β = .37, p < .001). The importance of procedural knowledge goals of agricultural educators also had a positive effect on agricultural educators' adoption of IBL (β = .24, p < .001). The level of education an agricultural educator has obtained had significant effects on their self-efficacy (β = .15, p < .001) and their orientation towards teaching procedural knowledge (β = .10, p = .02). Education level of the agricultural educators had no effect on their orientation to teaching substantive knowledge, perceived student abilities, or perceived contextual hindrances. Further, agricultural educators' self-efficacy had significant effects on their perceived student abilities (β = .22, p < .001). Teachers' perceived student abilities was negatively related to their perceived contextual hindrances (β = -.64, p < .001).

Conclusions, Implications, & Recommendations

Determining how agricultural educators' beliefs about agricultural education, self, and context of agricultural education influenced their adoption of IBL provides valuable input for those who provide programming for teachers. Two factors were found to be predictors of agricultural educators' IBL decision-making: the value of teaching procedural knowledge and their self-perception of competence in implementing IBL activities. Self-efficacy and the inclination to teach procedural knowledge were also found to be connected. These two may be connected as an agricultural educator who is confident in organizing IBL activities would be more likely to spend a greater amount of instructional time with these activities.

Lotter, Rushton, and Singer (2013) discovered that professional development often fails when the beliefs of the teachers are not considered. Past research has documented that, in regard to IBL, professional development has neglected to assess the beliefs of teachers (Capps et al., 2012). Knowing agricultural instructors are more likely to adopt IBL if they feel confident in their abilities to organize IBL activities suggests a need for professional development (Silm, Tiitsaar, Pedaste, Zacharia, & Papaevripidou, 2017). Those who plan and facilitate IBL professional development for agricultural educators should incorporate activities that enhance their knowledge of IBL, give them experience with IBL, and allow time for them to practice adapting their lessons to IBL. By increasing teachers' self-efficacy in creating IBL lessons through professional development, more agricultural educators may begin adopting IBL as a regular part of their instructional practices.

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Research

Agricultural mechanics education exposure levels of entry year, Texas, school-based Agriculture, Food, and Natural Resource teachers

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Research

Agricultural mechanics education exposure levels of entry year, Texas, school-based Agriculture, Food, and Natural Resource teachers

Introduction

Agriculture, food, and natural resources (AFNR) programs instruct students through three interdependent components that include classroom and laboratory instruction, leadership and personal growth (FFA), and supervised agricultural experiences (SAE) (National FFA, n.d.). Furthermore, agricultural mechanics is one of the curriculum areas taught in an AFNR program. According to the Texas Education Agency (n.d.), the wide range of knowledge and skills for agricultural mechanics courses include: electrical wiring, operating hand and power tools, plumbing, concrete, fencing, cold and hot metal techniques, surveying, power systems, and planning and constructing a project. Saucier and McKim (2011) found that it is crucial for AFNR teachers to be prepared to instruct safely and effectively teach all of the skills related to agricultural mechanics. Sorensen, Lambert, and McKim (2014) found that skilled teachers are crucial to achieving student success; therefore, it is imperative that teachers are prepared properly and participate in professional development opportunities. Additionally, a common problem concerning school-based agriculture education is a large number of teachers leave the profession prematurely (McIntosh, 2017). Blackburn and Robinson (2008) noted that almost half of all novice teachers would change professions during their first seven years of teaching. A review of literature has indicated a variety of research on what agricultural mechanics skills professional development should focus on; however, there is limited research on teacher confidence levels to teach agricultural mechanics curriculum.

Theoretical and Conceptual Framework

To guide this study, Ericsson's Theory of Expertise and Bandura's Theory of Self-efficacy were utilized. *Expertise* refers to the characteristics, skills, and knowledge that differentiates experts and those with less experience (Ericsson, Charness, Feltovich, & Hoffman, 2006). The Theory of Expertise focuses on the characteristics of expert performance and mastery knowledge (Ericsson & Charness, 1994). In almost every domain, including agriculture education, methods of effective training and instruction run parallel with relevant knowledge and techniques (Ericson & Charness). In order for expert performance to be accomplished, 10 years of intense, deliberate performance, initial motivation and interest, proper instruction, instructor feedback, and required resources must all be met (Ericsson, Krampe, & Tesch-Romer, 1993). Furthermore, in order to better teach a student, or an AFNR teacher to master a skill, it is important to understand the requirements that first must be met. Bandura defines self-efficacy as one's beliefs in their own ability to execute a task which impacts an individual's decisions, actions, reactions to complications, as well as their overall level of success (Bandura, 1986). According to Ross, Cousins, and Gadalla (1996), teacher efficacy encompasses an individual teacher's expectation that he, or she, will be able to convey student learning. Through experiences, teachers are better able to develop a stable belief about their own abilities (Ross, 1998) – thus improving confidence. Moreover, teachers who are satisfied that they are successfully teaching their students appear to stay in the profession longer (Blackburn & Robinson, 2008). Furthermore, ones confidence in their own abilities is extremely important

when teaching students how to perform tasks that could be potentially dangerous to themselves as well as others (McKim & Saucier, 2013). McKim and Saucier (2013) further noted that professional development can provide teachers with experiences and information that could in return improve one's self-efficacy in regards to teaching specific curriculum and skills.

Methods

The purpose of this quantitative census was to determine agricultural mechanics exposure levels of entry year, Texas, school-based AFNR teachers during their undergraduate education and to determine their personal, professional, and program demographics. The following research objectives guided this study: (1) Determine the agricultural mechanics exposure levels of entry year, Texas, school-based, AFNR teachers during their undergraduate programs and (2) Determine entry year, Texas, school-based, AFNR teachers personal, professional, and program demographics. The population for this study were all (N = 150) entry year, Texas, school-based, AFNR teachers who attended a three-hour new teacher meeting at the 2018 Texas AFNR teacher professional development conference. Based upon a review of literature, a paper questionnaire was developed, reviewed by a panel of experts (N = 5), and subsequently revised. A pilot test (N = 19) was then conducted with a similar population which resulted in a reliability estimate of .96 for the confidence scale (Cronbach's alpha coefficient). Usable data was collected from 143 teachers for a 95.33% response rate. Based upon the research objectives, data was analyzed using IBM SPSS Statistics 22.

Results

Entry year AFNR teachers in Texas were taught the following top three agricultural mechanics skill areas at their respective undergraduate institutions: *hand tools* (f = 116; 81.10%), *handheld power tools* (f = 116; 81.10%), and *stationary power tools* (f = 114; 79.70%). The least three agricultural mechanics skill areas taught to entry year AFNR teachers in Texas were: *hydraulics* (f = 43; 30.10 %), *modern machinery technology* (f = 38; 26.60%), and *pneumatics* (f = 24; 16.80). Entry year, Texas, school-based, AFNR teachers indicated that they were mostly female (n = 91; 63.6%), had an average age of 26 (M = 26.23; SD = 7.55), of white ethnicity (n = 120; 83.9%), unmarried (n = 87; 60.8%), who completed a Bachelor's degree (n = 126; 88.1%), and who completed a traditional teacher certification program (n = 96; 67.1%). These teachers teach in a rural community (n = 83; 58.0%), work in a two-teacher program (n = 54; 37.8%), completed 9 hours of agricultural mechanics coursework in college (M = 9.40; SD = 9.98), and completed a high school agricultural mechanics course as a student (n = 76; 53.1%). Results of this study should be limited to the responding population in attendance at this early career teacher meeting and do not reflect the entire population of all new AFNR teachers in Texas.

Conclusions, Implications, & Recommendations

Entry-year AFNR teachers had the highest exposure levels to agricultural mechanics skill areas that included hand and power tools and the least exposure to more technology rich agricultural power applications (hydraulics, modern machine technology, and pneumatics) during their undergraduate education. Numerous implicative questions arose from these results

that include: Why were entry level AFNR teachers minimally exposed to technology rich agricultural mechanics skill areas? With minimal exposure to advanced technologies, are teacher's confidence level to instruct these skill areas impacted? These results and others are grounds for more in-depth research in this area. Additionally, teacher educators and professional development providers should considering increasing education to remediate these results.

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An assessment of undergraduate research skills in agricultural communications

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An assessment of undergraduate research skills in agricultural communications

Introduction / Need for Research

Many scholars have identified a variety of benefits stemming from undergraduate research experiences. For universities, undergraduate research opportunities can lead students to pursue graduate studies (Lopatto, 2004). For students, growth in cognitive ability is often a reward of participating in research. Students who participated in undergraduate research have noted gains in understanding contemporary concepts within a field or discipline, along with interpreting data and communicating results (Kardash, 2000). Undergraduate researchers have also cited benefits such as gaining knowledge about a topic, improving one's resume, learning how to conduct research, and preparing for graduate school (Craney et al., 2011).

Employers, too, cite the value of research skills held by potential employees and have indicated a stronger likelihood to consider a job candidate who has participated in a collaborative research project (Hart Research Associates, 2015). The potential to equip agricultural communications students with an additional set of valuable skills through undergraduate research appears evident. However, despite the clear benefits, agricultural communication has traditionally lacked assessments of undergraduate research.

Theoretical Framework

Learning is a process of constructing meaning, and constructivism explains how learners make sense of their experiences (Doolittle & Camp, 1999; Savery & Duffy, 1995). Proponents of constructivism argue that understanding is created through interaction and negotiation with one's environment (Savery & Duffy, 1995), and knowledge is gained when individuals take ownership of creating it (Driscoll, 2000). Constructivism also emphasizes the role of reflection as a means to evaluate personal knowledge and to help the learner interpret his or her experiences (Savery & Duffy, 1995). The teacher's role, in constructivist pedagogy, is to engage with the student in a two-way dialogue to share and construct meaning based upon an activity of reciprocal interest (Hunter, Laursen, & Seymour, 2007).

Splan, Porr, and Broyles (2011) found constructivist learning theory to correspond with undergraduate research specifically, and concluded that learning experiences should be authentic, student-centered, active, and facilitated through social negotiation. At the same time, undergraduate research provides a platform for problem-based learning driven by open-ended, challenging, or ill-structured questions. The student researcher's role allows for engagement in creating knowledge by taking ownership of an authentic learning task (Splan et al., 2011). As constructivism encourages the integration of real-work environments or issues to create authentic learning contexts, undergraduate research is an applicable fit (Doolittle & Camp, 1999).

Methodology

Students in a senior-level capstone course in agricultural communications in Spring 2018 and Spring 2019 at Texas Tech University were included in this study. Students in both groups were placed into groups and assigned an agricultural organization to research. Initially, students performed web searches to better understand their organization's purpose, activities, and existing online presence. Student groups had to formulate research objectives and select an appropriate study timeframe. Then they used Meltwater, a social media monitoring platform, to search for

relevant online content. To conclude their research projects, students created detailed reports to answer the research objectives, present their findings, and offer suggestions for future improvements or changes to their organizations' online social media presences.

Students completed a questionnaire about their research project experiences at the end of the semester. The instrument included eight statements to determine the impacts of the project on research skills and benefits of the research process (Hunter et al., 2007; Savery, 2003; Trosset, Lopatto, & Elgin, 2008) using a 5-point Likert-type scale where 1 = *strongly disagree* and 5 = *strongly agree*. Thirty-two of 34 students in the 2018 class, and 43 of 48 students in the 2019 class completed the survey, resulting in 77 usable responses. Descriptive statistics were used to analyze the data.

Results

Students indicated they enjoyed researching and monitoring their organization on social media and despite some challenges in using the social media monitoring program, they appreciated the opportunity to synthesize collected data. Students also expressed frustration associated with the lack of content from the organizations they were tasked to research. However, students indicated overall agreement in the development of research multiple research skills. Most prominently, students indicated intent to produce a meaningful final report ($M = 4.43$, $SD = .55$) and that they were involved in designing some aspect of the project ($M = 4.19$, $SD = .78$). Additionally, this experience enabled students to sort and select data appropriate for addressing the research purpose ($M = 4.08$, $SD = .68$) and encouraged them to use social media metrics platforms in the future ($M = 3.87$, $SD = .92$). Students also agreed the research project exposed them to what research in agricultural communications could be ($M = 3.85$, $SD = .78$) and while working on the project students encountered a sense of curiosity ($M = 3.82$, $SD = .91$). Finally, the students expressed less agreement overall on the statements "working on this project increased my interest in the agricultural communications profession" ($M = 3.21$, $SD = .87$), and "I searched for additional information to complete the project" ($M = 3.13$, $SD = 1.13$).

Conclusions & Implications

While the research opportunity for these undergraduates afforded them the chance to take ownership of a learning task (Splan et al., 2011) driven by an open-ended question and sought to be reflective real-world issues (Doolittle & Camp, 1999), many participants expressed frustration with the ambiguous nature of the project. However, the fact that the majority indicated agreement with statements of research skills and benefits aligns with Savery and Duffey (1995) and other constructivists that learning occurred, as evidenced in the student reflections of the experience. It is possible that allowing more flexibility in the research topic, rather than assigning topics, may lessen frustrations with the research process, as topics of mutual interest for both student and teacher are hallmarks of meaningful undergraduate research experiences (Hunter et al., 2007).

As the benefits of undergraduate research have been clearly documented in the literature (Craney et al., 2011; Kardash, 2000; Nagda et al., 1998), agricultural communications instructors are encouraged to integrate opportunities for undergraduate research into class curriculum, and actively engage with the students in the projects. Instructors should refer to the tenants of constructivism to create meaningful undergraduate research opportunities.

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Research

An Examination of Agricultural Mechanics Laboratory Safety Conditions in Texas: Perceptions from Texas Agricultural, Food, and Natural Resource (AFNR) Teachers who Supervised Students Competing in the 2018 San Antonio Junior Agricultural Mechanics Project Show

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An Examination of Agricultural Mechanics Laboratory Safety Conditions in Texas: Perceptions from Texas Agricultural, Food, and Natural Resource (AFNR) Teachers who Supervised Students Competing in the 2018 San Antonio Junior Agricultural Mechanics Project Show

Introduction

Agricultural mechanics courses have been a significant part of the agricultural education curriculum since its inception and are popular across the United States (Anderson, Velez, & Anderson, 2014). The agricultural mechanics classroom and laboratory offer unique experiences for many students, providing real-world engagement in the context of a safe learning environment (Langley & Kitchel, 2015). Moreover, safety in the agriculture mechanics laboratory is a major concern for teachers, students, parents, and administration (Clay, 2017). Therefore, the implementation of adequate safety methods and practices is essential to agricultural mechanics laboratories. Johnson, Schumacher, and Stewart (1990) conducted a study to identify the agricultural mechanics laboratory management needs of in-service agricultural education teachers in Missouri. One of the areas they found to have the highest need for professional development was laboratory safety. A more recent study conducted by Saucier and McKim (2011), assessed student teachers in Texas and concluded that safety in the laboratory required a need for additional professional development. Researchers further noted that frequency and severity of accidents that occur in the agricultural mechanics laboratory can be reduced when these facilities are managed by educators who are competent in the area of laboratory safety and facility management (McKim & Saucier, 2011). To ensure that agricultural mechanics laboratories remain a safe place for student educational enrichment, it is critical that professional development opportunities be offered for teachers who instruct students in these specialized educational facilities (McKim & Saucier).

Theoretical Framework

To guide this study, the Theory of Planned Behavior (TPB; Ajzen, 1991) was utilized. In an effort to update the Theory of Reasoned Action (TRA), Ajzen (1985; 1991) hypothesized that attitudes often fail to exhibit strong correlations with behavior because of the large number of factors that potentially prevent the attitude from being converted to behavior. Therefore, he developed the concept of *intention,* as a link between attitude and behavior, to strengthen the relationship. This model was limited in its explanatory power, however, Ajzen (1991) extended it by including *perceived behavior control* to account for internal and external constraints on behavior (Fogarty & Shaw, 2010). The TPB is based on the proposition that an individual's behavior is a direct function of the behavior intention with behavioral intentions being shaped by attitudes, subjective norms, and thus, shaping perceived behavioral control (Fogarty & Shaw). Moreover, TPB suggests that an individual's intentions, or attitude, and exposure to subjective norms and perceived behavioral control (internal and external), play a role in the behavior they will present in a given situation. Fogarty and Shaw (2010) examined how safety climate and TPB can lead towards a prediction of unsafe behavior. Huang, Ho, Smith, and Chen (2006) also found

that a measure of safety control has close parallels with the notion of perceived behavioral control and can assist in mediating the effect of a safety climate on self-reported injuries.

Methods

A sub-study of this census was to determine the safety conditions of agricultural mechanics laboratories that Texas AFNR teachers who supervised students that competed in the 2018 San Antonio Junior Agricultural Mechanics Project Show taught in and their personal, professional, and program demographics. The following research questions guided this study: (1) What are the personal, professional, and program demographic characteristics of Texas Agricultural, Food, and Natural Resource teachers, who supervised students who competed in the 2018 San Antonio Junior Agricultural Mechanics Project Show? (2) What are safety conditions of the agricultural mechanics laboratories in which these teachers instruct students? The population for this study were all Texas AFNR teachers who supervised students who competed in the 2018 San Antonio Junior Agricultural Mechanics Project Show and who attended a show meeting. Prior to this show, a panel of experts (n = 5) with experience in agricultural education and agricultural mechanics, were used to evaluate the instrument for face and content validity. Based upon their suggestions, the instrument was revised and a pilot test (n = 17) was then conducted to ensure reliability. A reliability analysis was conducted and the instrument was deemed reliable (Ary, Jacobs, & Sorenson, 2010). All teachers present at the show meeting were presented with this booklet style questionnaire and 120 usable responses were collected. However, results from this study should be limited to only the participants who provided data.

Results

Teachers indicated that they taught with an overall average departmental budget of $25,689.80 (SD = 29,401.83), had an average agricultural mechanics budget of $10,009.78 (SD = 12,733.08), and taught in a laboratory that was approximately 4,500 ft² (M = 4,477.39 ft²; SD = 5,476.35) in size with the majority of these laboratories being older than 16 years (f = 62; 51.7%). Their average budgets for Personal Protection Equipment were $3,505.45 (SD = 5,892.12), Consumables were $4,558.43 (SD = 6,993.29), and for Tools and Equipment were $4,263.16 (SD = 7,849.68). Teachers also indicated that the agricultural mechanics laboratory was either in need of minor repair (f = 28; 23.3%) or they were older, but still functional laboratories (f = 28; 23.3%). Handtools in these laboratories were 1 – 5 years of age (35.8%; f = 43), handheld powertools were 1 – 5 years of age (46.7%; f = 56), and stationary powertools were 6 – 10 years of age (31.7%; f = 38). Additionally, these teachers have taught for over 10 years (M = 10.46; SD = 10.20) with the greatest amount of respondents earning a salary between $56,000 - $60,000 per year. Additionally, the majority of teachers were male (f = 96; 80.0%), of white ethnicity (f = 103; 85.8%), had an average age of 37 years (M = 37.10; SD = 11.61). Other results will be reported more in-depth on the poster.

Conclusions, Implications, and Recommendations

Respondents were mostly male, white, middle-aged, and mid-career who taught in older, but functional agricultural mechanics laboratories with ample teaching budgets. Additionally,

teachers indicated that only a few minor and major accidents that occurred in the previous academic year. Implicative questions suggest: How safe are laboratories in reality? Are teachers' perceptions of safety augmented by any internal or external factors? Should safety inspections exist for schools? Recommendations suggest that teacher educators and in-service providers understand the actual safety conditions of agricultural mechanics laboratories across the U.S. and the equipment teachers are instructing with. This is in-order better prepare educators by offering an industry skill-based, STEM related, and rigorous undergraduate teacher education program and high quality, and impactful continuing education workshops for existing teachers.

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Research

An Examination of the Agricultural Mechanics Professional Development Needs of Texas School-Based Agricultural Science Teachers

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An Examination of the Agricultural Mechanics Professional Development Needs of Texas School-Based Agricultural Science Teachers

Introduction

Agricultural education provides students with knowledge about agriculture, food, and natural resources, along with a wide variety of skills. The basic core of agricultural education consists of three intra-curricular components; classroom instruction, experiential learning through supervised experiences, and leadership activities. When these three components are actualized, they provide a context for learning necessary content and life skills to prepare students for adulthood (Dailey, Conroy & Shelley-Tolbert, 2001). Specialized facilities, such as laboratories, are often an integral element used for each of these three components to further enrich student learning experiences (Saucier & McKim, 2011). One of the subjects taught within agricultural education, is agricultural mechanics. It is estimated that 40% to 66% of instructional time, in many agricultural education programs, involves agricultural mechanics education (Saucier & McKim, 2011). Due to this, it is imperative for agricultural educators to be well-versed in agricultural mechanics. Well prepared and knowledgeable agriculture teachers can guide agricultural education students safely and effectively in the development of practical, hands-on skills and agricultural mechanics education (Saucier & McKim, 2011). Skilled teachers are critical to student achievement. Therefore, the need to provide effective professional development is essential for improving student learning (Sorensen, Lambert & McKim, 2014).

Conceptual Framework

To guide this study, the Borich Needs Assessment Model (1980) was used. The fundamental concept of the Borich needs assessment model is to allow teaching and research to be developed based on the most needed area first (Saucier, & Langley, 2017). More specifically this model enables "researchers/evaluators to purposefully prioritize teaching and/or research competencies so participants can receive training in the most needed area first, and in each successively less urgent area (competency), if time and funding permit the extension of a training and professional development session" (McKim, 2013). The Borich Needs Assessment Model allows researchers to create a Mean Weighted Discrepancy Score (MWDS) by comparing scaled measurements of importance, knowledge, ability to perform, and ability to teach others to perform.

Methodology

The purpose of this quantitative study was to determine the agricultural mechanics professional development needs of Texas, school-based agricultural science teachers and their personal, professional, and program demographic characteristics. To guide this study, the following research questions were utilized: (1) What are the personal, professional, and program demographic characteristics of Texas agricultural science teachers who taught agricultural mechanics related curriculum? (2) What are the agricultural mechanics skill professional development needs of Texas, school-based agricultural science teachers who taught agricultural mechanics related curriculum? The population for this study were all (N = 1,754) Texas, school-

based agricultural science teachers during the 2014-2015 academic school year. A panel of experts (n = 7) with experience in agricultural education and agricultural mechanics were used to evaluate an online instrument for face and content validity. Based upon their suggestions, the instrument was revised and a pilot test (n = 17) was then used to ensure reliability. A reliability analysis (Cronbach's alpha coefficient) of the scales of measurement was conducted (Importance = .916, Ability to Perform = .936, & Ability to Teach = .937) and the instrument was deemed reliable (Ary, Jacobs, & Sorenson, 2010). A random sample (n = 315) of the population was conducted based on recommendations from Krejcie & Morgan (1970). Usable responses were collected from 154 teachers with a response rate of 48.89%. To ensure generalizability of the results to the population, *Method 1 – Comparing Early to Late Responders* (Linder, Murphy, & Briers, 2001) was utilized which indicated no differences existed between the groups. Scaled data was analyzed using the Borich (1980) Needs Assessment Model and IBM SPSS Statistics 22.

Results

Respondents indicated that they were 41 years of age on average (M = 41.79; SD = 11.33) with the majority of teachers being of white ethnicity (f = 126; 81.8%), married (f = 105; 68.2%), and having children at home (f = 102; 66.2%). Teachers indicated that they teach on average 4 (M = 3.89; SD = 1.86) agricultural mechanics courses during the school year, with 51.3% of programs that offered an industry supported certification program for students (f = 79), the agricultural mechanics laboratory they taught in was over 4400 ft² in size (M = 4,430.07 ft²; SD = 4,585.07 ft²), and the majority of laboratories were 16 or more years of age (f = 77; 50.0%).

Within the *Performance Competence*, the top three agricultural mechanics skill areas that teachers indicated they need professional development in were: *Modern Machinery Technology* (MWDS = 1.60), *Hydraulics* (MWDS = 1.58), and *Pneumatics* (MWDS = 1.43). The bottom three competencies needing professional development in this competence were: *Oxygen/Fuel Brazing* (MWDS = 0.64), *Oxygen/Fuel Welding* (MWDS = -1.09), and *Fencing* (MWDS = -1.52). When evaluating the *Consequence Competence*, the top three agricultural mechanics skill areas needing professional development were: *Hydraulics* (MWDS = 1.84), *Modern Machinery Technology* (MWDS = 1.70), and *Pneumatics* (MWDS = 1.69). The bottom three competencies needing professional development were: *Oxygen/Fuel Brazing* (MWDS = -0.60), *Oxygen/Fuel Welding* (MWDS = -0.97), and *Fencing* (MWDS = -1.36).

Conclusions, Implications, & Recommendations

The majority of teachers indicated that they were mid-career, in their early 40's, of white ethnicity, and male, who taught four classes of agricultural mechanics during a school year. Across both the performance and consequence competence, teachers indicated a professional development need in the majority of the agricultural mechanics skill areas. However, across both competences, the skill areas of Modern Machinery Technology, Hydraulics, and Pneumatics arose to the top. Additionally, the skill areas of Oxygen/Fuel Brazing, Oxygen/Fuel Welding, and Fencing were always the least needed for professional development. Implications from this research are very important to the longevity of mid- career teachers and the overall welfare of students who work and learn in an agricultural mechanics laboratory. By understanding the knowledge and ability levels of these experienced teachers, adequate and timely professional

development opportunities can and should be enacted. To retain these teachers in an industry that typically loses many teachers after their third year, stakeholders (agricultural education faculty, state agricultural education supervisors, and local school administrators) should consider in-service opportunities, salary/ workplace improvements, and pre-service education advancements.

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Benefits of Using Industry Based Online Modules for Teaching Small Engines

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Benefits of Using Industry Based Online Modules for Teaching Small Engines

Introduction & Theoretical Framework

Higher education programs that specialize in agricultural science teacher preparation have the challenging mandate of not only maintaining high standards in knowledge and development, but also of seeking and promoting innovative contemporary philosophies of teaching/learning strategies compatible with changing societal needs. The number of learners taking distance learning, blended, hybrid and distance learning courses has reached unprecedented levels (Johnson, Adams, Becker, Estrada & Freeman, 2014). A key concern for many post-secondary educators is whether their students are satisfied with their learning experience (Arbaugh, 2014; Strong, Irby, Wynn & Mclure, 2012). The contextual features of a hybrid course can provide the necessary environment to guide, and if necessary, correct actions to positively influence students' development of self-regulated learning skills (Chumbley, Haynes, Hainline & Sorenson, 2018) and using online learning objects, such as industry developed modules, can help address these concerns.

Learning objects originally developed for use in online learning environments can also be used to enhance face-to-face instruction (Nugent et al., 2016). Online learning objects (LOs) are small, stand-alone, mediated content resources that serving as building blocks to develop lessons, modules, or courses. While the definitions of learning objects vary, the literature showed that there generally are three common characteristics: they are digital, they support learning, and they are reusable (Moisey & Ally, 2007; Kay, 2014). LOs supporting face-to-face classes can serve many purposes: as background/review covering prerequisite course knowledge; to replace a lecture; to reinforce, laboratory presentations; and to serve as a review for an exam. The capability of LOs to support a variety of instructional contexts helps meet educational needs of the growing diversity of students in both K–12 and college settings.

The theoretical framework for this study is based on Bandura's (1986) social cognitive theory, particularly using self-efficacy as necessary for ability. With self-efficacy being closely related to ability, if a person has low efficacy or confidence in a task, then their performance in that task is expected to be low, and conversely, higher ability levels would tend to increase their motivation levels and as a result, their level of performance (Bandura, 1997).

Methodology

The purpose of this study was to determine the impact of the Briggs & Stratton Master Service Technician (MST) online modules on student learning objectives in the [UNIVERSITY] small engines course. During the Summer I 2019, the researcher taught a five week small engines hybrid course. This consisted of two days a week a 5-hour lab, with remaining instruction taking place online using instructor developed materials and student completing the five online MST modules. The MST modules consist of 50 questions each, with multiple choice answers. These questions are taken from the Briggs & Stratton associated Small Engines book. A passing grade for each exam is a 75%. Students are allowed to take the exams no more than twice every 24 hours. Modules containing videos and book chapter links are provided to assist students in studying for each exam module.

To monitor the learning impact of the MST, students at the end of the course completed a researcher developed survey based off the [STATE] standards for the power & machinery course. These state guidelines are the minimum skills that high school students would have after

completing the course. The goal was to assess if the MST helped post-secondary students gain skills in the related areas and assess its value at both the post-secondary and secondary levels.

Students were asked, "Specifically after completing the MST, how did the modules affect your learning sills related to ….". The class consisted of 18 students. They varied in grade level from Juniors (8) and seniors (10). All but two students completed all MST modules with a score of at least 75% (passing). The survey instrument was 25 questions on a 1-5-point Likert type scale of 1= no impact on skill development to 5=had a high impact on skill development. The survey was broken down into five categories: *employability skills, alternative energy sources, tool use, small engine maintenance & agricultural power systems*. When testing reliability, the Cronbach's alpha coefficient was at a .79, which is acceptable for developing research (Nunnally & Bernstein, 1967).

Findings

It was found the MST had the highest impact on skills related to maintaining small engines and the least impact on skills related to alternative energy sources in agriculture. The MST was found to have a positive impact on students learning "*Disassembling and reassembling small engines*" (m = 4.67), "*Principles of Operation in Small Engines*" (m = 4.50) and "*Troubleshooting Small Engines*" (m = 4.50). Table one provides a breakdown of scores by learning category. The MST had the least impact on students learning "*Describing the role of ballasting and traction in farm tractors*" (m = 3.17) and "*Selecting tractors based on application and power requirements*" (m = 3.61). Table one provides a breakdown of scores by each category.

Table One

Overall Impact Scores of the MST on Power and Machinery Learning Objectives

Category	*M*	*Mode*	*SD*
Using Alternative Energy Sources	3.73	4	1.05
Agricultural Power Systems	3.82	4	1.08
Employability	4.04	4	0.99
Using the Appropriate Tool	4.31	5	0.68
Maintaining Small Engines	4.50	5	0.61

Conclusions and Recommendations

While inferences beyond this sample population should be taken with caution, this data does provide some insight to the benefits of supplementing instruction with the MST online modules. We found that the MST had a significant impact on students' knowledge of maintaining small gas engines. It had a positive impact on tool use and employability scores as well. We also found areas where it was lacking. This research suggests that using the MST in the power & machinery course will require other tools to supplement teaching students about alternative energy sources and agricultural power systems. We did find that in relation to power systems, students felt the MST had a positive impact on learning skills related to exhaust system components (m = 4.44) and "*applying the appropriate lubricant by a maintenance schedule*" (m = 4.11). Teachers are encouraged to use the MST to supplement instruction in their agricultural mechanics courses. Further research is recommended to validate these results and further measure the impact of industry-based certifications in teacher education courses.

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Characteristics, Challenges, and Opportunities in Montana's Agritourism Industry

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Introduction/Framework

Improving tourism has proven to build rural economic resiliency, community motivation, and positive visitor perceptions (Akin, Shaw, & Spartz, 2015). Tourism can be developed around existing community assets, including "natural resources, outdoor sports, and recreation, agriculture, and unique cultural features to increase economic benefits" (Akin et al., 2015, p. 1; Hugo & Lacher, 2014; Norby & Retallick, 2012). Tourism in rural areas has transformed over the years into the idealized small town appeal of today (Gartner, 2004). Many people, specifically those who live in more urban areas, romanticize the idea of a rural lifestyle (Harrington, 2017). Agriculturalists are increasingly choosing to capitalize on this idea through the incorporation of agritourism into their businesses (Harrington, 2017). The National Agricultural Law Center (2018) defines agritourism as "a form of commercial enterprise that links agricultural production and/or processing with tourism…to attract visitors onto a farm, ranch, or other agricultural business for the purposes of entertaining and/or educating the visitors and generating income for business owner" (p. 1). Chase et al (2018) developed a conceptual framework for agritourism that incorporates two tiers of activities, core (on-farm) and peripheral (off-farm), and five activity sectors, including direct sales, education, hospitality, outdoor recreation, and entertainment. Within this framework, education is a core tier activity that "takes place on a working farm or ranch and has deep connections to agricultural production and/or the marketing of a farm's products" (p. 17). Agritourism operations with educational activities that aim to educate and engage the public in agricultural experiences were the focus for this study.

The agricultural way of life provides diverse opportunities for landowners to generate income outside of farming or ranching (Matthews, 2012; Mitchell & Turner, 2010). Agritourism refers to the combination of agriculture and tourism to connect farms and communities. Agritourism, as an informal on-farm activity, offers community education in agricultural production and can lead to more informed public decision-making (LaFolette et. al., 2014). This approach allows producers to connect directly with consumers to add depth and variety to their products, services, and income. These on-farm activities could include farm stays, farmers markets, hay mazes, pick-your-own orchards and vegetable gardens, school visits, hosted dinners, and community supported agriculture programs. Research has confirmed that agritourism can add supplemental income to a farm (Sullins, Moxon, & McFadden, 2010), provide opportunities for smaller farms to stay competitive through diversification (Matthews, 2012), and provide employment options for locals or family members on the farm (Van Sandt, Low & Thilmany, 2018). Agritourism and recreational services in the [region] have increased 20.7% from 2007-2012 (Chase et al, 2018). Montana is a particularly viable location for agritourism because it exemplifies the three main factors that positively affect farmers' participation- "public access to the farm for recreation, farms near central cities, and farms in Rocky Mountain regions" (Baji & Reeder, 2012, p. 189). While agritourism is a growing industry nationwide (Carpio, Wohlgenant, & Boonsaeng), little research exists specific to Montana with its two largest industries in agriculture and tourism (MDA, 2019). This study addresses the AAAE National Research Agenda Priority Area 6: Vibrant, Resilient Communities, Question Two: "How do agricultural leadership, education, and communication teaching, research, and extension programs impact local communities?" as agritourism can be an effective means of advancing community development and education.

Methodology

The purpose of this qualitative study was to examine Montana agritourism stakeholders' perceptions of industry characteristics, challenges, and opportunities. The objectives were to: (1) Identify the challenges faced by agritourism operators, (2) Identify common questions of agritourism operators, and (3) Describe characteristics of a successful agritourism enterprise. There are currently 19 defined agritourism operations in the Montana (MDA, 2019). The sample consisted of seven stakeholders- four current agritourism operators and three extension agents located in active agritourism counties. An interview guide was developed by researchers to explore agritourism concerns, activities, motivations, demand, challenges, questions, and support. A team of three researchers conducted semi-structured interviews via WebEx once a week over a three month period. Interviews were transcribed using Descript and content analysis was performed as each researcher independently coded data. Emergent codes were then organized into themes during researcher analysis sessions (Creswell, 2014, p. 186). Credibility and confirmability was established through peer examination of the data; trustworthiness measures included inter-rater comparisons and audit trails; and transferability was accomplished with rich details of the context and situation (Creswell, 2014).

Results

Seven themes revealed challenges faced when starting or operating an agritourism enterprise: liability, public interaction, regulations/legislation, monetary investment, time constraints, labor shortage, and a lack of business management skills. Common questions focused on business advice, liability, legislative obstacles and regulations, and effective marketing strategies. Seven themes emerged as characteristics of a successful agritourism enterprise in descending order of importance: creating a memorable visitor experience; a good marketing scheme; passion for the business; location with demand; a solid business plan; understanding operation skills and limitations; and business diversity.

Conclusions, Recommendations, and Implications

The most common themes in all responses related to the need for accessible liability information, public interaction regulations, and assistance with business management. Montana regulations were a top concern for enterprises to manage risk when interacting with the public. State laws are currently unclear so regulations must be enacted to inform and protect agritourism operations. Insurance agencies need programs that allow for diversification and risk management of farm businesses interested in agritourism. The top rated characteristics of an effective operation were creating a unique experience for visitors and having an effective marketing plan. To be successful, the operator must create a memorable experience to connect consumers with agriculture through various informal educational activities as described by Chase et al (2018). A sense of community was dominant theme throughout the data. Agritourism businesses must encourage community interactions to provide the public with a unique experience of where their food comes from to help advance the entire agricultural industry (Akin, Shaw, & Spartz, 2015). A well-planned marketing strategy, including road signs, word of mouth, social media, and advertisements, appears vital to reaching consumers. Operators are seeking guidance from experts and authorities to improve their own enterprises. As such, mentoring and networking programs should be developed to connect agritourism businesses with economic development organizations, extension education, and agricultural and tourism associations, as well as a designated Montana coordinator. As this industry grows, post-secondary agricultural education should consider adding courses and majors in agritourism to meet demand.

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Comparing U.S. and Australian Twitter Content During Extreme Drought Conditions

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Comparing U.S. and Australian Twitter Content During Extreme Drought Conditions

Introduction/Need for Research

Australia and the U.S. have similar dry environments that are subject to natural disasters (Wilhite, 1986). An example is the 2018 extreme droughts in Australia and America. Dry conditions devasted communities across Australia and became particularly heartbreaking as extreme heat destroyed crops and forced farmers to lessen a majority of their livestock herds (Scarr, Wu, Cai, & Inton, 2018). Additionally, cattle slaughter was up by 17% as drought affected the grassy agriculture land (Quackenbush, 2019). In the U.S., drought engulfed half of the country (56%) in the summer months of 2018 (Mersereau, 2018), leading U.S. farmers to yield the smallest wheat crop in more than a decade, down 48 bushels per acre (Associated Press, 2018). Furthermore, ranchers across Texas reduced their herds by 25% during the drought, fueling heavy revenue losses in the beef industry (Warren, 2019).

Researchers have determined, during the 2012-2013 drought in Nebraska, Twitter conversations increased as drought conditions worsen and agricultural issues or extreme weather affected the public (Wagler & Cannon, 2015). Roshan, Warren, and Carr (2016) suggested when large Australian organizations respond to a crisis on social media, they lack an awareness of the potential of social media for crisis communication. These organizations often did not utilize crisis response strategies that may increase reputational risk (Roshan et al., 2016). Furthermore, social media platforms are becoming more prominent tools in crisis communication strategies. The purpose of this study was to explore and compare differences between Australian and U.S. use of Twitter during a natural disaster crisis.

Conceptual Framework

Opinion leaders utilize influence over members of the social system in which they exist (Rogers, 2003). According to Park (2013), opinion leadership via Twitter plays a vital role in motivating individuals who are passionate about an issue to actively use Twitter. Social media should give a voice to its stakeholders who support the organization during a crisis, thus allowing a positive echo on the internet (Coombs, 2015). Additionally, with the rise of social media sites, opinion leaders help organizations understand public opinion in social media (Winter & Neubaum, 2016). Organizations can be recognized as leaders on social media by providing timely information about the important issues facing the public (Wagler & Cannon, 2015).

Methods

This quantitative study utilized Meltwater, a social media monitoring program, to gather all content relevant to drought in Australia and the U.S., based on keywords and phrases, posted publicly to Twitter between May 1, 2018, and August 31, 2018. These dates were chosen due to the normality of drought in the U.S. during the summer months, and a review of literature showing extreme drought during this time frame in Australia (Braganza, 2019). A social media monitor for U.S. and Australia was created in Meltwater to collect content utilizing a keyword search for “drought” and at least one of the following keywords or phrases: “agriculture” and “livestock”. Content was filtered within the Meltwater dashboard (i.e. metric for showing country content distribution) for tweets within Australia or the U.S. Meltwater provides several tools, called widgets, to analyze the data. Widgets used in this study were sentiment (i.e. positive, negative, or neutral), social reach (i.e. total number of people reached by social

content), and engagement (i.e. conversation that revolves around a brand or organization) of Twitter users. The collected data were analyzed in the Meltwater dashboard to determine the highest social reach of agricultural organizations. The lead researcher then downloaded data to Excel and coded for tweets from agricultural organizations in each country.

Results

The Meltwater social media monitor search resulted in 586 tweets publicly posted to Twitter in Australia and 2,840 tweets in the U.S. Tweet sentiment was primarily negative in Australia (59%), and neutral in the U.S. (58%). In Australia, the highest social reach, posted by Twitter user @Reuters, reached 19.8 million people. In the U.S., Twitter user @Nasa had the highest social reach of 29.5 million. The top agricultural organization, based on social reach analyzed within Meltwater, are shown in Table 1.

Table 1
Twitter Content of Agriculture Organizations with Highest Social Reach in Australia and U.S.

Organization	Number of Tweets	Engagement	Reach
Australia			
ABC Rural	26	786	985,750
National Farmers	12	150	277,714
Vic Farmers	4	5	47,321
U.S.			
Farm Bureau	6	31	144,515
USDA	5	22	126,944
Ag Professional	1	0	38,682

Note: Farm Bureau and USDA data were compiled from all departments of the organizations.

Conclusions

The results of this study indicate sentiment during extreme drought in Australia were negative and neutral in the U.S. Agricultural organizations ABC Rural, National Farmers, and Vic Farmers in Australia had the most content, and the most engagement, and reach, compared to content, engagement, and reach from Farm Bureau, USDA, and Ag Professional in the U.S. ABC Rural, an agricultural news source, was the most active on Twitter during the time frame with the highest social reach of agricultural organizations during the assessment of both countries.

Implications/Recommendations/Impact on Profession

During a crisis, leadership can have an impact on the effectiveness of the crisis management efforts (Coombs, 2015).Thus, followers on Twitter, joined with opinion leaders, take part in creating content for important issues and disseminating information (Hwang, 2015). Social media are becoming more prominent for crisis communication strategies. The results indicated Australian agricultural organizations were more active during the study's time frame than American agricultural organizations and reached more people. Because the results are limited to Twitter, future studies should examine Facebook conversations in Australia and the U.S. during extreme drought.

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Creativity in the Classroom: Exploring Creativity in College of Agriculture Courses

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Introduction

In a 2018 Forbes article, Powers (2018) stated "creativity is the skill of the future." Creativity and innovation are seen as crucial skills to be successful in the current global economy (O'Bryan, 2018), and creativity continues to be a necessary individual and social component to maintain a competitive advantage (Sternberg & Lubart, 1999). The need for creativity in the agricultural industry is especially imperative with the growing challenges on the industry to feed and clothe the world in the 21st century as identified in Priority Area 3 of the AAAE National Research Agenda (Stripling & Ricketts, 2016). Intarachaimas (2012) suggested a need for promoting creativity in agricultural students to stimulate future creative problem solving in the agricultural industry and the development of new approaches to the future problems these students may encounter in the workplace. According to Gibson, Hancock, Meyers, and Irlbeck (2016), further research is needed to better understand the overall cohesive outlook on creativity, especially within higher education. A great place to start is in an industry important to our basic human needs: agriculture (Intarachaimas, 2012). The purpose of this study was to define what creativity looks like within agricultural fields of study while assessing and exploring interventions and measures of creativity in courses in the College of Agricultural Sciences and Natural Resources (CASNR) at Texas Tech University.

Theoretical Framework

Tied to much of the research on creativity in higher education, the social constructivist theory suggests the experiences of being engaged in learning are better implemented through the shared social interactions within a classroom (Kim, 2001). The Zone of Proximal Development (ZPD) connects these social contexts and the cognitive processes of students and allows for an integrated learning environment where meaningful knowledge is attained (Vygotsky, 1978). The ZPD has been shown to link students' current level of creative development to their potential creative growth through various pedagogical strategies (Shabani, Khatib, & Ebadi, 2010).

Methodology

A qualitative, phenomenological research design was used to investigate courses within CASNR at Texas Tech University. A purposeful sample of courses offered in the college were selected due to their incorporation of creative components and the capability of providing rich data. Of the courses identified, seven instructors representing each department within the college were recruited via email to participate in one-on-one, semi-structured interviews. An interview guide adapted from Gibson et al. (2016) was used to provide consistency to each interview. Interviews were audio recorded to ensure authenticity and transcribed verbatim using the transcription software Temi with field notes taken during each interview. Data were analyzed in NVivo using open and axial coding via the constant comparative method as suggested by Creswell (2013) with credibility established through member checking and persistent observation from seasoned educators and researchers (Guba & Lincoln, 1989). Each participant was given a pseudonym to ensure the confidentiality of their responses.

Results

This study sought to define what creativity looks like and to assess and evaluate interventions and measures of creativity in an agricultural higher education program. When participants were asked about defining creativity, two themes emerged: *creativity in doing* and *creativity is all encompassing*. Many of the descriptions provided about creativity involved it being an action.

Dr. Frank defined creativity as "the ability or the desire to create." Similarly, Professor Kent stated, "I would probably define it is that need, that kind of visceral feeling, that you have to do something." Additionally, some participants stated creativity seemed to have an existence in everything. Professor Doug explained, "Creativity is all around us. It's in everything that we see, in everything that we do."

Of the interventions and teaching styles participants used to enhance creative thinking, four themes emerged: *individual learning, group learning, discussion,* and *experiential learning*. The *individual learner* was an emphasis for most participants. Dr. Jack expressed the first component to facilitating creative learning is "a desire of the learner to actually learn…they're not going to be creative if they don't want to do anything." Many of the courses also included a *group learning* component. Dr. Grant referenced the stimulation evoked from group work, "They might think about it more creatively in a sense, [be]cause they're going to think about the problem." *Discussions* provided an additional opportunity for creative learning for many participants. Dr. Frank expressed, "As an instructor, you will encourage creativity because that questioning and response is gonna keep people engaged and thinking and creating." Participants also discussed the influence of *experiential learning* on creative learning. Professor Kent stated, "Creativity happens through trial and error. Creativity is iterative. Creativity is going to be based on you succeed by failing."

The assessments and measurements used by participants to evaluate creativity fell within two main themes: *formal vs. self-assessment of creativity* and *student comfort level*. Many participants expressed the difficulty of *formally assessing* creativity. Dr. Frank stated, "Creativity is hard to assess on a grade value, you know there's an inherent difficulty there." These difficulties led to many participants seeking opportunities for students' *self-assessment* of their creativity. Professor Doug stated, "As long as you do the work, you don't get judged on the creativity. You judge yourself on the creativity." Another factor shaping students' creative growth was *student comfort level*. Dr. Grant explained, "The way I think about creativity is basically trying to pull together different things and being outside of your comfort zone."

Conclusions/ Implications/Recommendations

Many of the participants' views on creativity supported the social constructivist theory and the need for social learning to promote creativity (Kim, 2001). All participants agreed that creativity is important for learning and in each of their respective industries in order to be successful, although it may look a bit different in each field. Real-world applications help promote the creative mind and open the door for applicable creative thinking. As a cohesive definition of creativity continues to develop, the development of creative thinking skills will remain an important topic of interest for educators and employers.

As university classes increase in size, the ability to encourage individual learners directly will become more challenging; therefore, it is important to implement group learning and discussion as a means to develop the creative thinker in new ways. Further research is needed to explore how creativity is implemented and encouraged in other colleges throughout Texas Tech University and in other colleges of agriculture across the country to develop a better understanding of creativity and its impact throughout higher education. Instructors should continue to explore ways to influence and encourage their students' creative growth.

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Differences in Perceived and Ideal Levels of Program Components Among SBAE Teachers in Georgia, Oregon, and Texas

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Differences in Perceived and Ideal Levels of Program Components Among SBAE Teachers in Georgia, Oregon, and Texas

Introduction/Purpose

There is a current shortage of school based agricultural education (SBAE) teachers and has been since 1965 (Smith, Lawver, & Foster, 2018; Kantrovich 2007). While retirements and lateral moves can account for some of the teaching loss, Smith et al. (2018) noted over 500 teachers left the profession prior to retirement. Ingersoll and Smith (2003) reported 42% of teachers left the profession because of burnout driven by conflict between work and family expectations. Work-life balance has been the subject of several studies where work-weeks in excess of 55 hours were the norm in several regions (Hainline, Ulmer, Ritz, Burris & Gibson, 2015; Crutchfield, Ritz & Burris, 2013; Murray, Flowers, Croom & Wilson, 2011). Similar studies indicated that family and work conflicts are linked to intentions to leave among SBAE teachers (Sorenson, McKim, & Velez, 2016). This abstract is part of a larger line of inquiry looking beyond the notions of work-life balance and into the balance of the SBAE programs themselves. The purpose of this study was to investigate the differences between perceived levels of programmatic components (Classroom Instruction, SAE, and FFA) and how SBAE teachers would ideally balance their program.

Theoretical Framework

The theories framing this study are Expectancy Value Theory (EVT) along with the Theory of Planned Behavior (TPB). Wigfield (1994) suggested one's decision-making process, through the lens of EVT, is predicated by a mix of an individual's expectations for success coupled with intrinsic and utility values (cost vs usefulness) held by the individual towards the task. Ajzen's TPB (2006) posited behavioral intention (decision making) is driven by personal attitudes toward the behavior, subjective attitudes (norms) shaped by "referent" individuals (Ajzen, 2000, pp. 62), as well as perceived behavioral control where the outcome may be thought to be influenced by a lack of support by stakeholders. These theories are connected to the study by the proposition where a potential disconnect between what a program is and how an SBAE teacher would like it to be, could be part of the frustration and burnout that exacerbates work-life balance issues and may be related to the larger attrition issue.

Methodology

A Qualtrics instrument was developed by the researchers where respondents indicated their perceived and ideal balance of their programs among the three modeled areas of agricultural education: classroom instruction, SAE, and FFA. The instrument was checked for face and content validity and pilot tested among New Mexico SBAE teachers. The pilot data was used to calculate a Chronbach' Alpha ($\alpha = .92$). A stratified random sample was taken from Georgia, Oregon, and Texas from the respective regions, sections, and areas delineated by respective FFA offices. As part of a larger study, samples from each state needed to be relatively uniform in size. As a result, 20 SBAE teachers were selected from each of the three regions in Georgia, 15 from each of the four sections in Oregon, and five from each of the 12 areas in Texas. The instrument was delivered digitally following the recommendations of Dillman, Smyth, and Christian (2014). To account for potential non-response error, early responders were compared to late responders. No significant differences were found between early and late responders on perceived levels of classroom instruction $t(119) = -.402$, $p = .688$, SAE $t(119) = -.205$, $p = .838$, or FFA $t(119) = .774$, $p = .440$.

Findings

Data were exported into SPSS (25) and explored for potential violations of assumptions (Field 2013) with no issues found. Paired sample *t* – Tests were run with significance level set *a priori* at $\alpha = .05$. Significant differences were found (Table 1) between the perceived and ideal means of classroom instruction levels among Agriscience teachers from Oregon ($M_{perceived}$ = 50.85, M_{ideal} = 41.19, $t(47) = 5.07$, $p < .001$, $d = .69$), Georgia ($M_{perceived}$ = 46.12, M_{ideal} = 41.11, $d = .33$), $t(30) = 2.68$, $p = .010$), Texas ($M_{perceived}$ = 40.27, M_{ideal} = 32.18, $t(30) = 5.06$, $p < .001$, $d = .66$), as well as the differences between the entire sample ($M_{perceived}$ = 46.50 M_{ideal} = 38.85, $t(120) = 7.05$, $p < .001$, $d = .53$). There were also significant differences found between the mean and ideal SAE levels in Oregon ($M_{perceived}$ = 18.52, M_{ideal} = 28.64, $t(47) = -8.96$, $p < .001$, $d = 1.12$), Georgia ($M_{perceived}$ = 23.17, M_{ideal} = 27.76, $t(41) = -3.04$, $p = .004$, $d = .50$), Texas ($M_{perceived}$ = 24.85, M_{ideal} = 30.90, $t(30) = -3.40$, $p = .002$, $d = .60$), as well as the differences between the entire sample ($M_{perceived}$ = 21.75, M_{ideal} = 28.91, $t(120) = -8.42$, $p < .001$, $d = .75$). There were no significant differences between the perceived and ideal levels of FFA activities in any state.

Table 1
Differences Between Perceived and Ideal Levels of Classroom Instruction and SAE in Georgia, and Texas

	n	*t*	df	*p*	Cohen's d	Effect*
Classroom Instruction						
Oregon	48	5.07	47	< .001	.69	Medium
Georgia	42	2.68	41	.010	.33	Small
Texas	31	5.06	30	<.001	.66	Medium
Overall	121	7.05	120	<.001	.53	Medium
SAE						
Oregon	48	-8.96	47	< .001	1.12	
Georgia	42	-3.04	41	.004	.50	Large
Texas	31	-3.40	30	.002	.60	Small
Overall	121	-8.43	120	< .001	.75	Medium

* (Cohen, 1988)

Conclusions, Implications, and Recommendations

Respondents from all included states provided data that showed significant differences between current and ideal levels of classroom instruction with each state indicating that less time should be spent. This perceived surplus of time allocation could be a potential source of work-work or work-life imbalance which could have impacts on career choices and longevity (Ingersoll & Smith, 2003; Sorenson, et al., 2016). Further research should be conducted to identify how teachers are allocating their time in this area and where they would like to reduce time.

Similarly, all states reported data that indicated a desire to increase the level of SAE focus in their programs. It cannot be discerned from this study if this increase is a desire for more time allocation to supervise SAEs, more students engaged in SAEs, more opportunities for members to exhibit their projects, or more diversity in the options for potential SAE projects. A needs assessment should be conducted to identify areas of improvement or opportunities to increase SAE activity or implementation.

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Effects of a Professional Development Session on Career and Technical Education Teachers' Perceptions of Importance, Competence, Curriculum Availability, and Ability to Teach Two-Stroke Engine Theory and Safety

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Effects of a Professional Development Session on Career and Technical Education Teachers' Perceptions of Importance, Competence, Curriculum Availability, and Ability to Teach Two-Stroke Engine Theory and Safety

Introduction

Shultz, Anderson, Shultz and Paulsen (2014) investigated the perceived capabilities and perceived importance of skills within the mechanic's laboratory setting. One such content area that [STATE] career and technical education teachers need more professional development is small engines (Shultz et al., 2014). The small engine safety content area within small engines was rated as one of the top ten important skills to learn. The recommendations called for an in-depth look at each of the topics to locate specific areas of need. Other studies regarding agricultural education teachers and their professional development needs have been conducted and illustrate the need to offer more opportunities for agricultural mechanics professional development (Byrd, Anderson, Paulsen, & Shultz, 2015b; McKim, Saucier, & Reynolds, 2010; Peake, Duncan, Rickets, 2007; and Saucier & McKim, 2010;). Byrd et al. (2015b) found that agricultural education teachers needed more time in their teacher preparation program in order to gain sufficient competence in small engines to feel effective in the classroom.

Theoretical Framework

This research was guided by the Concerns-Based Adoption Model (CBAM) (Hall & Hord, 2006). See Figure 1 below. The model is designed to describe, measure, and explain the change process that teachers experience when attempting to implement new curriculum materials and instructional processes (Anderson, 1997). Utilizing CBAM allows researchers to gather two types of data that relates to the concerns of the teacher about new programs, products, or ideas that are newly implemented or offered and the teacher's knowledge of the new curriculum or idea and how they implement it (Chumbley, 2016).

Purpose and Objectives

As the present study was part of a larger study related to the teaching and learning of two-stroke engines, its purpose was multi-faceted. The first purpose was to create and validate a new instrument related to understanding the teaching of two-stroke engines content within secondary career and technical education coursework, while the second purpose was to assess the effectiveness of an industry-led two-stroke engines instructional workshop. The purpose of the present study was to evaluate perceived importance to teach, perceived competence to perform, perception of the curriculum available to teach, and perceived ability to teach selected skill areas related to two-stroke engine theory and safety prior to and after attending a two-day intensive professional development session.

Methods

The population of this study consisted of 20 ($N = 20$) career and technical education teachers from across the United States. These teachers participated in an intensive two-day, two-stroke engines training workshop held at the [UNIVERSITY] agricultural mechanics-teaching laboratory. The focus of the workshop was instruction related to a wide variety of areas related to two-stroke engines, service, testing, repair, etc. Prior to the workshop activities, we developed a research instrument designed to gather data related to two-stroke engines instruction conducted within secondary schools. This instrument, using a Likert-type scale, addressed a variety of

areas, including curriculum availability, skill performance competency, teaching competency, etc., and as designed to be used to collect pre- and post-workshop data. A panel of 10 experts with varying backgrounds that included agricultural education teacher educators with experience teaching agricultural systems technology-related courses and industry representatives were consulted as the instrument was constructed. These experts identified 51 different skill areas commonly taught within two-stroke engines instruction. The panel of experts also served to review the instrument for face and content validity.

Results

Data displayed in Table 1 details the grand means and standard deviations of the responses given pre- and post- workshop from teachers in each of the four categories. The largest increase from the pre-workshop to post-workshop perceptions were found in the two-stroke engine competence construct with a pre-workshop $M = 3.18$ and a post-workshop $M = 3.91$. Participant overall abilities also increased when you compare the pre-workshop $M = 2.89$ to their post-workshop $M = 3.52$. Participants did exhibit a slight decrease in their level of importance of the two-stroke engines workshop from their pre-workshop $M = 4.39$ to their post-workshop $M = 4.31$.

Table 1
Grand Mean Construct Scores for Two-Stroke Engine Workshop Participants.

Construct	Pre ($n = 20$)	Post ($n = 20$)
Importance	4.39; SD = .618	4.31; SD = .603
Competence	3.18; SD = .738	3.91; SD = .697
Curriculum	2.32; SD = 1.039	2.87; SD = .878
Ability	2.89; SD = .748	3.52; SD = .740

Conclusions, Discussion, & Recommendations

There are several conclusions that come from the results of this study; however, it should be reiterated that due to the small nature of this study that these conclusions not be generalized beyond this population. It can be concluded that career and technical education teachers that participated in the workshop had a high perception of importance of teaching two-stroke engine concepts. This is evident with their decision to attend a professional development activity on this topic. This coincides with the conclusions found by Shultz et al. (2014) where teachers identified small engines as an important content area to teach. According to the Concerns-Based Adoption Model (SEDL, 2018), the participants would have progressed to the Informational stage because they have sought out an opportunity to learn more about two-stroke engines.

Teachers also exhibited an increase in their competence to perform two-stroke engine theory and safety skills after taking part in the two-day workshop. This conclusion reinforces Byrd et al. (2015a) findings that teachers need more time to become competent with small engine content. Participant competence increased the most in the areas of theory of operation and troubleshooting & failure analysis. With such large increases in these areas and the initial high levels of perceived importance of the content, these areas could be the specific topics that participants wanted to learn about prior to taking the workshop. To continue to enhance teacher competence in two-stroke small engines, it is recommended to provide additional professional development opportunities that continue to build upon the knowledge gained in the workshop.

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Evaluating Michigan's FARM Science Lab as a Modality for Agricultural Literacy

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Introduction

Michigan's FARM Science Lab is a 40-foot trailer equipped to host 30 students at 10 learning stations teaching standards-based, agricultural-themed lessons to grade K-5 students (L. Grasman, personal communication, May 22, 2017). Nine similar mobile agricultural labs operate nationwide, reaching an average of 40,000 students per unit annually (Miller & Spielmaker, 2018). While these and other science-focused mobile laboratory programs exist, very little published literature about their effectiveness or impacts exists (Jones & Stapleton, 2017). This study analyzed the data collected from students and teachers to determine the effectiveness of the FARM Science Lab as a means for increasing agricultural literacy.

Theoretical Framework

The Logic Model for Agricultural Literacy was used to operationalize Kolb and Dewey's experiential learning theory through interventions (inputs) leading to desired agricultural literacy outcomes (Kolb, 1984; Spielmaker, Pastor, & Stewardson, 2014). In this context, a program was an intentional use of specific resources put into specific activities to produce a desired outcome within a specific context (McLaughlin & Jordan, 2004). Bloom's Taxonomy was also used to categorize assessment questions (Perkins, 2008).

Purpose/Objectives

The purpose of this study was to evaluate the effectiveness of the FARM Science Lab as a modality for increasing agricultural literacy among third- through fifth-grade students and teachers. This research addressed the American Association for Agricultural Education National Research Agenda Priority 1 concerning "what methods, models and programs are effective for informing public opinions about agricultural and natural resources issues?" (Roberts, Harder, A., & Brashears, M. T., 2016, p. 10).

Methods

This quasi-experimental study tested short-term knowledge gain through a one-group pretest-posttest design. In this repeated measure design, each of the four lesson's assessment contained a mixture of multiple choice or true and false questions unique to the specific objectives of each lesson aligned with Next Generation Science Standards (NGSS, Lead States, 2013) and the National Agricultural Literacy Outcomes (NALOs) (Spielmaker & Leising, 2013). The curriculum, pretest/posttest, and teacher evaluation were reviewed by the researcher, industry experts, and university professors to ensure content curricular validity and criterion-related validity between the student agricultural literacy outcomes and the teacher perceptions. The teacher evaluation consisted of 10 questions: five Likert scale, four yes or no, and one free response question—all evaluating the appropriateness of the lesson, connection to classroom learning, overall quality of the presentation, teachers' perceptions of student learning during the lab session, effectiveness of agriculture as an example to contextualize science principles, and the likelihood of teachers to use Agriculture in the Classroom materials in the future. All lessons and questions in the instrument were developed by Michigan Agriculture in the Classroom staff. Assessments and the teacher survey were distributed via Google Forms then exported into Microsoft Excel and SPSS for analysis. Unique identifier numbers were used to pair pretest and posttest responses.

Results

Table 1
Mean Pretest and Posttest Statistical Differences for all Michigan FARM Science Lab Lessons

			Pretest		Posttest				
Lesson	Grade level group	*n*	*M*	*SD*	*M*	*SD*	Mean differences	*t*	Cohen's d
Extraction of Life (score out of 7)	Fourth, Group 1[a]	10	5.70	0.48	6.30	0.48	-0.6	-3.67*	1.64
	Fifth, Group 1	109	5.04	1.21	5.65	1.00	-0.62	-5.49*	-0.66
	Fifth, Group 2	46	4.35	1.58	5.22	1.26	-0.87	-4.29*	0.90
Field Plastic (score out of 6)	Third, Group 1[a]	45	1.31	0.87	2.27	1.03	-0.96	-5.59*	1.18
	Fourth, Group 2[a]	53	1.83	1.19	4.00	1.07	-2.17	-10.09*	1.96
	Fifth, Group 1	18	1.28	0.96	4.39	0.7	-0.19	-13.53*	4.89
	Fifth, Group 2	27	1.59	1.05	3.52	1.12	-1.93	-7.53*	2.05
Parts per what (score out of 5)	Third, Group 2[a]	150	1.61	1.13	4.05	1.05	-2.43	-20.18*	2.33
	Fourth, Group 2[a]	130	2.73	1.29	4.26	0.95	-1.53	-11.67*	1.45
Resourceful bean (score out of 5)	Third, Group 1	133	3.26	1.22	4.06	1.01	-0.81	-6.84*	0.84
	Third, Group 2	82	2.56	1.34	3.34	1.36	-0.78	-4.45*	0.70
	Fourth, Group 1	148	3.55	1.21	4.20	0.95	-0.64	-5.90*	0.69
	Fourth, Group 2	71	2.97	1.22	2.90	0.42	-0.66	-3.84*	0.64
	Fifth, Group 1	34	3.32	1.07	4.65	0.54	-1.32	-6.73*	1.63
	Fifth, Group 2	67	2.15	1.49	4.51	0.68	-2.36	-12.75*	2.20

[a] Only one group per grade level.
*$p < .05$.

In addition to student assessments, 72 teachers (48%) completed a survey; 28% ($n = 20$) third-grade, 34% ($n = 25$) fourth-grade, 25% ($n = 18$) fifth-grade, and 12% ($n = 9$) selected "I don't see my grade here." Teachers agreed the lessons addressed appropriate educational outcomes for their grade level ($M = 4.08$) and their students' understanding of agriculture increased as a result of the experience ($M = 4.13$). The questions were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). On average, these teachers believed agriculture could be very effectively used to contextualize science concepts. Teachers had a neutral response ($M = 3.39$) about their own increase in understanding about agriculture. These teachers indicated interest in seeking additional Agriculture in the Classroom resources.

Conclusions/Recommendations

The FARM Science Lab is making a difference in students' agricultural understanding—at a basic knowledge level—after a short intervention. Based on Bloom's Taxonomy or Webb's Depth of Knowledge Taxonomy, the assessment questions are only reaching a basic level of knowledge, recall, and remembering (Perkins, 2008). The 2014 definition of an agriculturally literate person suggests changes are not only needed in knowledge but also in attitudes, skills, behaviors, and practices in order to apply this agricultural knowledge to daily life (Spielmaker et al., 2014). The focus of lessons and assessment questions could be narrowed and aligned more closely with NALOs, to further measure this higher-order comprehension of the agricultural concepts (Spielmaker & Leising, 2013). This depth could push students beyond simple knowledge-based recall toward further application of a concept.

Teachers who responded to the survey had positive feedback about their experiences. Further follow-up should be conducted with teachers who did not respond to investigate their views of the program. Teachers indicated interest in using resources from the Michigan Agriculture in the Classroom website. Continued follow-up with these teachers through newsletters, mail, professional development, or social media could promote use of agriculture examples within their own lessons, extending the reach of the Michigan Agriculture in the Classroom program.

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Faculty Perceptions of Limitations on Student Creativity in College of Agriculture Courses

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Introduction/Need for Research

Creativity is sought as a skill of the future to address upcoming issues and problems in the growing world (Powers, 2018). The need to develop creative thinkers is present in many industries and is becoming an area of more focus in higher education. Previous research shows most students have creative potential at some level, creativity positively impacts individuals and society, and creativity is encouraged by many universities' mission statements (Edwards, McGoldrick, & Oliver, 2006). However, since 1990, the Torrance Tests of Creative Thinking have revealed a dramatic decline in creative thinking scores even though IQ scores have increased (Kim, 2011).

Incorporating creative thinking and learning opportunities is critical in higher education (Jackson, 2006) especially for agricultural students who are faced with the challenges of feeding and clothing the world in the 21st century amid evolving consumer demands and requests (Intarachaimas, 2012), a major focus of Priority Area 3 of the AAAE National Research Agenda (Stripling & Ricketts, 2016). However, encouraging and assessing creativity at the post-secondary level can be difficult as the concept is defined and understood in many different ways (Hancock, Gibson, Meyers, & Irlbeck, 2016). This often complicates students' and instructors' understandings of creativity and can hinder their ability to teach for and apply creative principles (Beghetto, 2005). The purpose of this study was to understand the limitations of creative growth in students from the perspectives of their educators. Specifically, this study sought to explore the factors restricting creative growth and expression in students enrolled in courses throughout the College of Agricultural Sciences and Natural Resources at Texas Tech University.

Theoretical Framework

The social constructivist theory has been used to understand the use of creativity in the classroom in many contexts. According to Kim (2001), social activities and interactions encourage learning and engagement. The Zone of Proximal Development (ZPD) connects cognitive processes and social contexts to promote a beneficial learning environment (Vygotsky, 1978) and has been used to establish the potential creative development of a student through different teaching practices (Shabani, Khatib, & Ebadi, 2010).

Methodology

Through a qualitative, phenomenological research approach, the researchers analyzed syllabi from courses offered within the College of Agricultural Sciences and Natural Resources at Texas Tech University to identify and purposefully sample courses that incorporated a variety of creative components across academic disciplines to provide rich data. Seven courses were selected, and the instructors of each course were recruited via email to participate in a one-on-one, semi-structured interview. To ensure consistency, an interview guide was adapted from a previous study analyzing creativity within agricultural communications programs (Hancock et al., 2016). Interviews were audio recorded to ensure authenticity and transcribed verbatim using the transcription software Temi. NVivo was used to analyze the data via open and axial coding utilizing the constant comparative method as suggested by Creswell (2013). Trustworthiness was established through member checking to ensure credibility and persistent observation from experienced faculty (Guba & Lincoln, 1989). Each participant was assigned a pseudonym to ensure the confidentiality of their responses.

Results/Findings

Three major themes emerged related to factors limiting students' creative abilities: student fear and personal judgement, concern for desired grade, and life experiences. In terms of *student fear and personal judgment*, many participants agreed students' often get in their own way when it comes to creativity and successfully accessing their creative mind. When producing something creative, a fear of judgment can hinder the results. Dr. Kristen stated students often experience "a general fear of what other people will think, not wanting to take risks that would out me as, you know, a weirdo." Fear of personal judgement also becomes a factor as Professor Kent said, "Oftentimes we were such harsh critics of ourselves…we undervalue so much what we're actually capable of doing." Dr. Jack added the anxiety playing a role in students' creative ability. He added, "People perform poorly and they're not going to be creative if they're anxious."

Participants also noted that students are often too concerned about the best and easiest way to get a *desired grade*, which limits their creative process. Dr. Jack stated, "There's a lot of stress in our culture today…tests and academic performance provide a lot of anxiety for people in general." Dr. Kristen added the struggles she encounters with keeping students' creative minds open:

> It's really hard to get beyond that mindset of getting the grade, even at the graduate level. It's really hard to get people to see beyond that – the stated objectives – to get the creative piece of who you are…And so when you have that as particular student goals, it seems to block the creative flow in my thinking.

Participants also felt students' *life experiences* shape their creative abilities. As Dr. Grant expressed, "Life experience causes people to be limited. So, people with more life experiences, we expect them to be more creative." Professor Kent alluded to the past judgment experienced by students to cause them to withdraw from their creative potential. Additionally, Dr. Kristen noted, "You have people who come from all these different experiences…and so you just have all of these rich experiences that come out, and people began to be authentic and they share."

Conclusions/Implications/Recommendations

The factors limiting the creative potential of students identified by participants were associated with their previous educational experiences and the encouragement and judgment of creativity they received in the past. A fear of judgment seems to exist in most students' minds and limits their creative growth potential. Moreover, the current education system has taught students to limit their creative effort and focus more on their intellectual growth (Sternberg, 2006), as many students are focused solely on achieving specific grades. Overcoming these fears and anxieties may be the first step toward promoting creative development in students.

Understanding the limitations to creative thought is just the first step in determining how to further develop the creative potential of students. There is a need to promote creative thinking in the world as the challenges we face evolve daily, especially in the agricultural industry (Intarachaimas, 2012). Future research is needed to better understand the limits on creativity caused by fear and to develop better approaches to promote creative thinking over academic performance. Courses in higher education should also address the evolving stresses placed on students and find ways to incorporate more creative thinking opportunities to promote ideas that address evolving industry challenges.

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POSTER TYPE: RESEARCH

Idaho Teacher Perceptions of Content Area Needs for New Agricultural Education Graduates

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Introduction

Agricultural education is a profession requiring a wide breadth of content knowledge reflecting the "dynamic and ever-changing industry of agriculture" (Phipps, Osborne, Dyer & Ball, p. 7, 2008). With all the demands on novice teachers, the question arises, what do they need in a B.S. degree program in Agricultural Education to be prepared for their initial foray into the profession? Gathering the teacher preparation and pre-service needs in agricultural education has long been a topic examined by researchers in the field (Burris, Robinson, & Terry, 2005; Duncan, Ricketts, Peake, & Uesseler, 2006; Roberts & Dyer, 2004; Sorensen, Tarpley, & Warnick, 2010; Touchstone, 2015). Determining which technical agriculture content teachers should be competent in is also difficult. An examination of content level requirements in other states revealed that only one state had a list of content competencies required for endorsement in agricultural education. Idaho like many other states, requires only content verification through credit hours and completion of the Praxis agriculture exam.

Current teachers are often best positioned to provide feedback to teacher educators, as they can gauge their own preparation with the demands of the profession (Touchstone, 2015). By gathering feedback from current teachers, we may be able to capture emerging needs and prevent deficits in knowledge for preservice teachers upon entering the classroom (Franklin & Molina, 2012). The purpose of this study was to gather input from current agricultural educators regarding the content areas they felt were important for new agricultural educators to possess upon graduation from a B.S. program in Agricultural Education.

Theoretical Framework

The foundation of this study was a portion of Mishra and Koelher's (2006) concept of Pedagogical Content Knowledge (PCK). The concepts surrounding PCK are involved in the manner with which teachers learn content in a way which will combine their knowledge of instructing students with their knowledge of the content to be taught. In this study, we utilized the content knowledge of existing teachers and asked them to identify those portions of content which were most important for them upon entering the classroom.

Methods

This study was conducted using an online descriptive survey. The study population was a census of all agricultural educators in Idaho *(N* = 149). The survey instrument included one demographic section, seven sections related to the importance of technical agricultural content items, and a section on importance of topics related to FFA and Supervised Agricultural Experiences (SAE). The demographic section allowed teachers to report age, gender, number of years teaching, and content areas they taught in their current appointment. Content areas were divided based on the pathways listed by the Idaho Division of Career and Technical Education. A total of $n = 67$ content topics in technical agriculture areas and $n = 7$ additional topics related to FFA and SAE knowledge were examined. Respondents rated each content item on a scale from 1 (not at all important) to 4 (extremely important). Each content section also included an open-ended response question for teachers to indicate any additional topics they felt were important.

At the end of the survey window, n = 88 respondents had completed the instrument for a 59.0% response rate. We sought to control for non-response error by contacting agricultural educators. We identified ten non-responders and asked their reasons for failing to respond (Rogelburg & Stanton, 2007). All non-responders contacted indicated a passive nonresponse intention. Rogelburg and Stanton note that "bias is not created by passive nonrespondents" (p. 200). Caution should still be taken when generalizing these results outside of survey respondents.

Findings

The mean importance scores for the highest rated item in each content area for all respondents, and for those who instructed in the content area are reported in Table 1.

Table 1.
Highest rated importance items by content area

	All Respondents				Content Instructors Only			
Content Area and Items	Min	Max	*M*	*sd*	Min	Max	*M*	*sd*
Agricultural Business								
Business Management	1	4	3.32	0.73	3	4	3.67	0.48
Agricultural Systems & Technology								
Safety principles & practices	3	4	3.85	0.36	3	4	3.86	0.35
Animal Science								
Livestock health & management	2	4	3.49	0.58	3	4	3.52*	0.50
ENR								
Sustainable agriculture practices	2	4	3.30	0.65	2	4	3.32	0.65
Leadership & Communications								
Public speaking	2	4	3.51	0.61	2	4	3.32	0.65
Plant Science								
Plant growth and development	2	4	3.45	0.61	2	4	3.48	0.58
Horticulture								
Greenhouse scheduling plans	1	4	3.44	0.73	2	4	3.52	0.68

Note. 1 = not at all important, 2 = slightly important, 3 = moderately important, and 4 = very important. * denotes topics with different order between all respondents and content instructors only

Discussion/Conclusions/Implications

Teacher education programs must be in a process of continual evolution to effectively meet the needs of modern agricultural education. What are the essential knowledge and skills for agriculture teachers and what is the best way to meet them? "New instructional programs must have qualified teachers. On the other hand, we must know the new programs and the knowledge and competencies needed to teach before developing teacher education programs" (Hill, 1962, pp. 4). Attending to this challenge will require continual reflection and reinvigoration of our programs, gathering information from inservice teachers is the beginning of that appraisal.

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Leadership Skill Development in a Student-directed Agricultural Communications Publications Production Course

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Introduction

Student-directed magazine production courses are designed to foster a hands-on learning opportunity for students in agricultural communications degree programs. Experiential learning courses like these simulate a 'real-world' work environment, where students are assigned roles and tasked with designing a magazine from conception to publication as a team (Hall, Rhodes, & Agunga, 2009). While technical journalistic elements such as writing and design are emphasized, the experiential component of these courses consequently allow students to develop strong soft skills such as leadership and collaboration (Morgan, 2010). Although there is overwhelming support for the introduction and integration of experiential education practices into undergraduate courses, minimal research has been done regarding the outcomes of those efforts on student's success (Hall, Rhodes, & Agunga, 2009). Studies on student-directed publications courses are even more underrepresented. Of the studies that exist, few seek to understand the development of soft skills such as leadership. Therefore, the purpose of this study is to describe and understand the self-identified leadership skills of agricultural communication students serving as editors-in-chief in a capstone-level, magazine production course.

Conceptual Framework

This abstract is part of a larger study which conceptually drew upon Kolb's (1984) Experiential Learning Theory (ELT). Kolb's (1984) theory posits that learning is a cyclical process, where students practice concrete experience, reflective observation, abstract conceptualization, and active experimentation. An abundance of research has been devoted to examining journalism courses within the context of Kolb's cycle. However, the stage most often underemphasized in theory and practice in the classroom is reflection (Boud, Keough, & Walker, 2005). We found the same to be true regarding the course under investigation. As such, this study specifically focused on the reflective observation stage, collecting retrospective details on skill development from former editors' points of view. This allowed us to gain insight into how that experience contributed to students' leadership development both during their time as editors and into their professional careers.

Methodology

Our target population for this study was current and former undergraduate students who served as editors-in-chief in an agricultural publications production course. Editors were students in charge of overseeing the development of the magazine and managing the student staff. We used department records to obtain a census of names and contact information of persons meeting this criteria. Thirty-two persons were identified as meeting this criteria. Using the contact information from department records, we sent recruitment emails to the prospective participants. If willing to participate, they were asked to share their availability. A basic qualitative research design was used for this study. We conducted one-on-one semi-structured interviews with twenty-six participants. We asked participants various questions related to skills needed to be a successful editor, high impact experiences, and competencies needed in their current careers. Due to the various geographic locations of the participants, they were given the option to interview in person, via the phone, or via web-conference. Each member of the research team transcribed their interviews. We then used open and axial-coding to analyze the transcripts.

Results/Findings

The former student editors had a technical interpretation of leadership skill and readiness. The students believed they were adequately prepared to be an editor because they had the necessary hard skills such as writing, editing, designing, and photography. However, many shared they struggled with interpersonal skills such as the ability to motivate a team, empathy, balancing responsibilities, and being good listeners. Additionally, intrapersonal skills such as self-confidence (needed to lead others), decision making, and the ability to communicate a vision were some of the personal struggles they faced. Overall, students realized they did not possess the necessary soft and relational skills needed at the beginning of their editor journey. However, they improved in their soft skills with time. We observed that a lack of prior leadership experience was a commonality for those who struggled with soft and relational skills. For many of the interviewees, the editor role was their first formal leadership position. Furthermore, many had not taken any leadership development courses prior to their experience.

Discussion/Recommendations

Students in agricultural communications capstone courses, especially those that are student-directed, have the unique opportunity to apply their skills in an environment that simulates the 'real world'. Although these capstone courses are primarily situated within the communications discipline, the opportunity to integrate leadership training should be recognized. Many of the interviewees believed they were qualified to serve as editors or leaders because they had the necessary hard skills to be successful. However, they did not account for the soft skills that were perhaps more necessary for leading and motivating a team. This perception may be a product of how students are selected for these editor roles. Many of the former editors believed they were selected because they had excellent writing, photography, and/or design skills. No one listed any soft or relational skills as a reason for gaining the position.

Although students enrolled in this agricultural communications course engaged in personal reflection/assessment of their abilities while acting as editors-in-chief, there was no time for formal reflective observation built into the course. As a result, some of the former editors expressed that the interviews were their first formal reflection about their time as an editor. According to Kolb (2015), this retrospective reflection is less ideal because it may hinder students' ability to fully assess the implications of their actions while engaged in an experience. Therefore, it is imperative to ensure that reflection activities are built into these project-based communications courses to ensure students fully complete Kolb's cycle by the conclusion of the course.

Future publications-focused capstone courses should use a criteria comprising of both hard and soft skills when selecting editors. It may also be beneficial to have student editors enroll in a personal leadership development/education course. These courses are typically designed to help students gain a better understanding of themselves and the more relational aspects of leading people. If a full course is not possible, a short-term leadership training program prior to beginning the editor role might help students to be more aware of what to expect when leading a team. This study also holds potential for informing curriculum development for other project-based or team-oriented communications courses. Educators teaching these courses should consider the benefits of emphasizing soft skill application, including leadership, into their classes.

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Likelihood of Agricultural Undergraduate Student Predisposition to Join Classroom Discussion Based Upon Critical Thinking Style, Gender, and Academic Performance

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Introduction

Students' engagement in classroom discussions plays an important role in active learning. Wade (1994) described an ideal class discussion as the majority of students engaging, participating in subject matter that is interesting, learning, and responding constructively to other students' comments, questions, and suggestions. Student classroom engagement can predict achievement of learning outcomes (Skinner, Zimmer-Gembeck, & Connell, 1998) and reflect student motivation (Skinner, & Belmont, 1993). Enhancing student classroom engagement could facilitate student learning and nurture student's critical thinking ability (Cohen, 1991; Crone, 1997). Research indicated that there are relationships between classroom discussion participation and class size (Hyde & Ruth, 2002), timing (Howard & Henney, 1998), course policies (Boniecki & Moore, 2003) and instructor sex (Crawford & MacLeod, 1990). However, most of these studies focused on external factors related to classroom discussion participation. Little research has explored the relationship between student characteristics and students' participation in classroom discussions. This study intends to contribute to filling the gap.

Theoretical Framework

Social development theory (Vygotsky, 1980) was used to guide this study. According to Vygotsky (1978), each student operates within a range of ability, and educators would best facilitate learning by presenting students with work that challenges them. The theory emphasizes the importance of social interactions in student learning. The learning process is developed through social interactions between students and a skillful professor, as well as with other students (Vygotsky, 1980). Encouraging classroom participation helps students improve their learning skills and enhances their motivation, creativity, and imagination (Rogoff, 1990). In school settings, students do not only learn from the instructors, they also learn from other students (Wilson, 2001).

Purpose & Objectives

The purpose of this research was to predict the likelihood of agriculture undergraduate students to participate in classroom discussions based upon academic performance, gender and critical thinking style. The objectives were to

1). Describe students' critical thinking style, gender, and academic performance.
2). Examine the association among critical thinking style, gender, academic performance, and participation in classroom discussions.

Methodology

A descriptive correlational research design was utilized in this study. The convenience sampling method was used for data collection from 104 agricultural undergraduate students at Texas Tech University. Critical think style was measured by the University of Florida Critical Thinking Inventory (UFCTI). Critical thinking style is described as the way of individual thinking in order to learn topics or acquire information (Lamm, 2015). The UFCTI has 20 items using Likert-type scale that ranges from 1= *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, 5 = *Strongly Agree*. UFCTI was developed to measure an individual's critical thinking style ranging from engagement to seeking information. Academic performance was measured by self-reported grade point averages (GPA) ranging from 1.0 to 4.0. The classroom discussion participation was identified by the question 'Do you like to participate in classroom discussions?' Particularly, it was measured through a nominal scale of 1= Yes and 0=No. Logistic regression was conducted to assess if GPA, gender and critical thinking style were

significant predictors of classroom discussion participation. The assumptions of normality, independence of errors and multicollinearity and linearity of the logit were checked and satisfied.

Results

A total 104 undergraduate agricultural students participated in this study. The sample included 67 (64%) females and 37 (36%) males. The students average GPA was 3.36 (M = 3.36, SD = .51). The UFCTI scores can range between 26 and 130. A score of 79 or higher indicates the student has a "seeking information" critical thinking style. A score of 78 or lower indicates an "engagement" critical thinking style. Students' overall critical thinking style scores in this study ranged from 64 to 91 (M = 74.76, SD = 3.60). The majority of these students (n = 68, 65.4%) stated that they like to participate in classroom discussions. The Nagelkerke R^2 estimate indicated that (R^2 =.11), 11% of the variance in classroom discussion can be predicted by a linear combination of GPA, gender and critical thinking style, χ^2 = 8.22, df = 3, N = 104, p =.04. However, individually, only gender was a significant predictor of classroom discussion, (β = 1.44, χ^2 = 7.02, p < .05). Specifically, male students are more likely to join classroom discussions. The results agree with the study from Crawford and MacLeod (1990) who found that males would participate classroom discussions more actively.

Conclusions and Recommendations

Although by most measures of effect, a R^2 of .11 is relatively small, this study provides quantitative evidence for understanding the relationships between classroom discussion and gender, academic performance, and critical thinking style. This study indicated that gender is a significant predictor for the classroom discussion. Male students were more likely to indicate that they participate in classroom discussions than female students. Students with an *information seeking* critical thinking style were more likely to participate in classroom discussions than those with an *engagement* style. This could be attributed to the characteristic of the seeking information style that desires to know the truth about topics and thus investigates a subject more deeply (Lamm & Irani, 2011). Additionally, this research agrees with the assertions of Vygotsky's (1980) theory that critical thinking can be cultivated within a social-historical context. We recommend that educators nurture classroom environments that encourage female students to participate classroom discussions. Additionally, in order to encourage students with engagement critical thinking style, instructors should conduct more interactive activities, such as group discussions or classroom debates. A replication of this study in different universities and involving a larger sample would be valuable in the future.

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Parents' Perceptions of Organic Food: A Qualitative Content Analysis of an Online Parenting Forum

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Parents' Perceptions of Organic Food: A Qualitative Content Analysis of an Online Parenting Forum

Introduction

Parents of young children willing to pay an average of $0.68 more for organic food (McFadden & Huffman, 2017); it is important to understand why. Redsell et al. (2010) and Hjelmar (2011) found parents believed organic food was healthier than local food. Cairns & Johnston (2015) wrote that parents believed buying organic food is part of good parenting. Each of these studies used interviews and/or focus groups to collect data. Organic food and related topics can be a contentious area (Haspel, 2018), so some parents may not have felt comfortable sharing their true opinions. The current study analyzed conversations about organic food on an online forum where parents are able to interact openly and anonymously.

Theoretical Framework

Online Disinhibition Effect. People are sometimes able to express themselves more freely online due to the Online Disinhibition Effect (Suler, 2004). Six factors (Dissociative Anonymity, Invisibility, Asynchronicity, Solipsistic Introjection, Dissociative Imagination, and Minimization of Status and Authority) result in both Benign and Toxic Disinhibition behaviors. Benign Disinhibition includes individuals sharing personal emotions, fears, or wishes or their being very helpful. Toxic Disinhibition includes rude, crude, or hateful behavior and/or visiting dark websites (Suler, 2004). The purpose of this study was to gain a better understanding of why parents choose to purchase organic food or not through anonymous online data.

Methodology

A qualitative content analysis of conversations about organic food on BabyCenter's online forums was conducted. This site was selected due to the high volume of people it reaches (more than 100 million parents monthly) (BabyCenter LLC, 2019). The Community section of the site, which allows parents to search for, and add to, conversations about a topic, was used for this study. 'Organic food' was used in the site's internal search tool and then filtered for Community results. The first 20 relevant conversations (Porter & Ispa, 2012) within one year of the search date (May 22, 2019) were analyzed for this study. A relevant conversation included any mention of organic food in the initial question or any responses. Each comment was coded in two phases. The initial phase found 14 codes. The coded comments were then verified by a second researcher who agreed with 76.7% of the coding. After making necessary changes, there was 100% agreement on the coded comments. This was more than the 80% needed for acceptance (Miles & Huberman, 1994). The codes were then organized into themes (Creswell & Creswell, 2018).

Findings

RQ1: Advantages of Organic Food, According to Parents. Two benefits of organic foods, as discussed by parents, emerged from the data and are shown in Table 1.

Table 1

Advantages of Organic Food, According to Parents

Theme	Description
Safer and/or Healthier	Eating organic is healthier and/or safer than eating conventionally grown food
More Ethical	Organic food is more ethical than conventionally-grown food

RQ2: Disadvantages of Organic Food, According to Parents. Five disadvantages of buying organic foods emerged from the data and are shown in Table 2.

Table 2

Disadvantages of Organic Food, According to Parents

Theme	Description
Expensive	Eating organic food is more expensive than eating conventionally grown food
Judged by Others	Parents who feed their children organic food are judged for doing
Distrust	Not trusting farmers to follow organic procedures or not trusting the value of organic labels
Product Quality	Organic food is dirty or imperfect
Not Healthier/ Safer	Organic food is not healthier or safer than conventionally-grown food

Conclusions

Some of the data agreed with past research's findings that parents believe organic food is healthier and/or safer (Redsell et al., 2010; Hjelmar, 2011). Parents in this study also described organic food as being more ethical. The data also revealed several disadvantages. Parents may have been more apt to share their feelings about organic food in the anonymous forum than focus groups or in-person interviews due to the Online Disinhibition Effect (Suler, 2004). Finally, Currid-Halkett (2017) and Cairns and Johnston (2015) both describe parents judging those who *do not* feed their children organic, but the opposite was found in this study. More research should be conducted to explain this phenomenon.

Implications

Finally, the parents in this study conveyed confusion regarding organic labeling, organic practices, and what "organic" is. With so much invested in organic food programs (USDA, 2016), future research should study how parents define "organic" and what they believe organic labeling and practices consist of. Research should also be conducted to understand which sources parents trust when determining which products are truly organic and what "organic" means.

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Perceived Barriers and Challenges to Study Abroad Based on Academic Classification and Major Within a College of Agricultural Sciences and Natural Resources

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Perceived Barriers and Challenges to Study Abroad Based on Academic Classification and Major Within a College of Agricultural Sciences and Natural Resources

Introduction/Need for Research

The Institute of International Education (2018) reported that the field of study with the highest percentage of U.S. students studying abroad was the Science, Technology, Engineering, and Math (STEM) field (25.8%). However, within the STEM field, the agricultural discipline had the lowest percentage of students who studied abroad (2.5%). In previous studies (Bunch, Blackburn, DanJean, Stair, & Blanchard, 2015; Chang et al., 2013; Briers, Shinn, & Nguyen, 2010), some of the most reported barriers is the cost of study abroad, the time commitment, and not being aware of programs available that are of interest. Study abroad experiences that may be of most interest to agriculture discipline students are those related to agriculture. Participants in a study pointed out wanting to participate in a study abroad trip related to their major (Schmidt, 2009). In addition, of the undergraduate U.S. students who engaged in study abroad for credit in the most recent academic year, the majority identified as juniors, but only 17.2% in total identified as freshmen and sophomores (Institute of International Education, 2018).

Conceptual Framework

The Theory of Planned Behavior (TPB) explains that people act on their beliefs when performing behaviors. There are three types of considerations, or beliefs, that lead to the intention (Ajzen, 2006). In regard to study abroad, behavioral beliefs include what benefits students perceive when deciding to study abroad, such as how the international experience will relate to their personal or career goals (Goel, Jong, & Schnusenberg, 2010). An example of this would be a student's major's importance at a global scale (Schmidt, 2009). Normative beliefs include the opinion of others regarding study abroad and if the act of study abroad is perceived as normal, especially by those who have a higher influence on the student. If a student's family and peers show value for an international experience like study abroad and perceive it as normal, the student is more likely to engage (Ajzen, 2006). Goel et al. (2010) reported that the majority of U.S. students who study abroad pick their junior or senior year of college to participate, and this may be seen as the normal or appropriate classification level, and there may be control beliefs that influence this. Control beliefs include anything that may help students more easily access study abroad, or factors that may prevent them from participating in an international experience. Some factors include cost, scholarships available, and a country's political situation, among other factors (Goel et al., 2010). The purpose of this study was to determine if there were perceived barriers and challenges, such as those listed above, to study abroad based on undergraduate students' major or academic classification.

Methodology

The population for this study consisted of undergraduate students in a college of agricultural sciences and natural resources (CASNR) at a 4-year university. There were approximately 416 undergraduate students enrolled in CASNR in the spring 2019 semester. The sample size of 201 students was determined using Krejcie and Morgan's (1970) small sample techniques. The final sample consisted of participants who completed the questionnaire, which was approximately 56 students. This provided a 27.8% response rate.

A web-based questionnaire was used to assess the challenges to study abroad based on students' starting major and academic classifications. The questionnaire was originally created

by Rieger (n.d.) to assess the willingness of college students to study abroad, and it has since been used to examine motivators and barriers to study abroad (Bunch, Lamm, Israel, & Edwards, 2013; Bunch et al., 2015; DanJean, Bunch, & Blackburn, 2015; Lamm & Harder, 2010). A test for nonresponse error was completed, and there were no statistically significant differences ($p<.05$) between respondents' mean scores on the barriers/challenges construct used.

One-way ANOVA tests were used to determine if there were statistically significant differences in the perceived barriers to study abroad based on the participants' academic classification and major. For academic classification, participants chose from (a) freshman, (b) sophomore, (c) junior, and (d) senior. For major or academic track, students chose from (a) agribusiness, (b) agricultural sciences, (c) agricultural education, (d) horticulture, (e) animal science, (f) wildlife and conservation science, (g) equine studies, or (h) their major resides outside the college of agricultural sciences and natural resources (CASNR). A Likert-type question asked students to indicate how big of a preventing factor to study abroad each reason to not participate listed was, with the scale being 1=Not a Reason; 2=Minor Reason; 3=Major Reason.

Results/Findings

There were no statistically significant differences in the perceived barriers or challenges to study abroad based on the participants' academic classification. Based on means, the researchers found that students of all academic classifications indicated similar preventing factors to study abroad. However, in regard to the item, "No interest in traveling outside USA," freshman (M=1.00, SD=.000) and sophomore (M=1.00, SD=.000) students' means were lower compared to juniors (M=1.39, SD=.502) and seniors (M=1.20, SD=.632). There were also no statistically significant differences in the perceived barriers or challenges to study abroad based on the participants' major or academic track.

Conclusions

There were no statistically significant differences in the barriers and challenges perceived to study abroad based on the participants' academic classification and majors. However, it should be noted that even though juniors and seniors are typically the students who study abroad, freshmen and sophomores are interested as well. Students of freshman and sophomore classification indicated similar means in the preventing factors to study abroad, such as cost and time, but indicated a higher interest in traveling outside the U.S. Even if they do not participate in an international experience until their junior or senior year, undergraduate students should be exposed to the idea of studying abroad as early as possible.

Recommendations

This study could be repeated with other institutions considering or interested in assessing student interest in study abroad. This could give a clearer understanding of whether there are differences in the perceived challenges to study abroad based on classification and major. If there are, then further research can be conducted with the goal of exposing students to international experiences at the most essential time of their academic career or relating to the most appealing subjects. This would all be in an effort to increase the agriculture disciplines' participation in study abroad.

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Preservice and Student Teacher Attitudes Toward the Education of Gifted Students in Agricultural Education

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Preservice and Student Teacher Attitudes Toward the Education of Gifted Students in Agricultural Education

Introduction/Need for Research/Literature Review

The National Center for Education Statistics (2018) reported in 2013-2014 that 6.7% of students in the United States participate in gifted programs. Yet according to Plucker, Giancola, Healey, Arndt, and Wang (2015), only two states require courses in gifted education for teacher preparation, even though the Higher Education Opportunities Act (2008) lists gifted and talented students among those where there needs to be "…focus on the identification of students' specific learning needs…" (p. 122) in teacher preparation programs. This research is consistent with research priority five of the American Association for Agricultural Education National Research Agenda, calling for efficient and effective agricultural education programs, with regards to teacher preparation and professional development (Thoron, Myers, & Barrick, 2016).

Theoretical and Conceptual Framework

The Differentiated Model of Giftedness and Talent by Francoys Gagné (2010) was utilized for this study. The model suggests that gifts (natural abilities) and talents (competencies) are separated by a developmental process in which students undergo to develop talent in a "field of human activity" (Gagné, 2010). Environmental and interpersonal catalysts influence the development of talents. Teachers are among those individuals within the environmental catalysts that influence and have an impact on their gifted students, as well as those provisions such as curriculum and pedagogy. Megay-Nespoli (2001) identified "moderately positive attitudes toward academically talented learners" among preservice teachers. Geake and Gross (2008) identified negative perceptions of gifted students' cognitive characteristics, social noncompliance, and antisocial leadership among inservice teachers. This study aims to identify attitude differences based on stage of teacher development: before and after student teaching.

Purpose, Objectives, & Methodology

The objective of this study was to identify the (1) attitudes of preservice agriculture teachers toward the education of the gifted after student teaching, and (2) how that differs from attitudes identified prior to student teaching. Gagné and Nadeau's Opinion About the Gifted and their Education questionnaire (1991) was modified to address agricultural education, as opposed to general education, and distributed to students in the final methods course for agricultural education and technology engineering education students in the Fall 2018 semester prior to student teaching (N = 20). Questionnaire statements were placed on a 6-point Likert-type scale (1 = *strongly disagree* to 6 = *strongly agree*). Students were given five questions about their preservice teacher preparation program and their only required special education course. The 35-item questionnaire was administered as a pre-test prior to a guest lecture on gifted and talented students. The questionnaire was then administered as a post-test at the conclusion of student teaching for agricultural education perservice teachers in the spring of 2019, as an optional part of the student teaching seminar course for agricultural education (N=16).

Results/findings

The pre- and post-tests were analyzed using an independent samples *t*-test. There were three questionnaire items that received significantly different responses after the student teaching experience. Preservice teachers felt significantly less prepared to teach gifted students in their

future classroom after having student taught. They believed some agriculture teachers feel their authority threatened by gifted children significantly more than they did prior to student teaching. They also believed that gifted students are valuable to the agriculture industry significantly more after student teaching than they did prior to student teaching.

Table 1
Attitudes Toward Gifted Students and Teacher Education Program

	Pre-Student Teaching			Post-Student Teaching					
Item	*M*	*SD*	*n*	*M*	*SD*	*n*	*t*	*p*	Δ
Utah State University has adequately prepared me to teach students identified as gifted and talented in my future classroom.	3.72	1.02	18	2.50	1.20	8	-2.682	0.013	-
Some agriculture teachers feel their authority threatened by gifted children.	2.50	0.97	17	3.63	1.41	8	2.342	0.028	+
Gifted persons are a valuable resource for the agriculture industry.	4.76	1.30	17	5.86	0.38	7	2.159	0.042	+
Our agricultural education programs are already adequate in meeting the needs of the gifted.	4.00	0.79	17	3.38	0.92	8	-1.755	0.093	-
The best way to meet the needs of the gifted is to put them in special classes.	3.00	0.84	18	2.38	0.92	8	-1.704	0.101	-

Conclusions, Implications, and Recommendations

Perceptions of preservice agriculture teachers toward working with gifted students changed due to the student teaching experience. They feel less capable in teaching gifted students, but also that these students are increasingly important to the agriculture industry.

Qualitative research should be conducted to determine what experiences during the student teaching experience caused this shift in belief, as well as why they feel the way that they do. Due to small population, this study should be replicated with a larger cohort of preservice agriculture teachers, administering the questionnaire both before and after the student teaching experience. Although non-significant, they decreasingly believe that special classes are needed to meet the needs to gifted students, but also decreasingly believe that our agricultural education are already adequate. So how are we meeting the needs of gifted and talented students in the classroom? More resources related to differentiating curriculum for gifted and talented students should be made available to preservice agriculture teachers, to both better prepare student teachers to teach students identified as gifted and reduce their perceptions of threatened authority.

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SAE and Me

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SAE and Me

Introduction/Theoretical Framework

Supervised agricultural experiences (SAEs) have long been identified as a critical component of agricultural education (Smith & Rayfield, 2016). According to the National Council for Agricultural Education (2017) an SAE is "a student-led, instructor-supervised, work-based learning experience that results in measurable outcomes within a predefined, agreed upon set of Agriculture, Food and Natural Resources (AFNR) Technical Standards and Career Ready Practices aligned to your Career Plan of study." The lack implementation of SAEs has been a problem documented in agricultural education for many years (Dyer & Osborne, 1995; Retallick, 2010; Steele, 1997; Wilson & Moore, 2007). A lack of SAE knowledge by both the teacher and the student, a lack of student motivation to participate in SAEs, and a shortage of teacher time to supervise SAEs have all been cited as possible causes of low SAE participation (Lewis, Rayfield, & Moore, 2012; Osborne, 1988; Steele, 1997; Wilson & Moore, 2007). A wealth of quantitative research has been done in this area over the years to attempt to determine why there is a lack of SAE participation by students however, there has been little to no qualitative research on the subject.

Given the lack of SAE implementation, we examined SAEs through experiential learning theory. Experiential learning theory is the combination of work from several researchers. They all generally require the learner to take part in a meaningful experience, reflect on the experience, and apply the knowledge gained to new situations (Dewey, 1938; Kolb; 1984). In order to gain a better understanding for why there continues to be a lack of SAE participation, qualitative research efforts must be made to go beyond what quantitative research has been able to provide (Lewis, Rayfield, & Moore, 2012). Given these recommendations for further research and the utilization of the reflection portion of experiential learning, the researchers probed deeper into the use of SAEs. The purpose of this study was to conduct an in-depth interview with a person who had an SAE in the past to identify factors that negatively impacted his/her SAE experience.

Methods

A qualitative, case study research approach was used to address the purpose of this study. A case study is an in-depth examination of a particular case, individual, program, project, or work unit and can be limited to one type of situation (Lichtman, 2014). Meta interview techniques were used for data collection in this case study because the relationship between the researcher and the interviewee affects the data (Lichtman, 2014). A semi-structured interview was most appropriate for this topic. For the sake of anonymity, the interviewee will be referred to as Daniel. The interviewee was selected because he had an SAE for the entirety of his secondary agricultural experience. To establish credibility analyst triangulation was employed where multiple analysts were used to interpret the data in an attempt to shed light on multiple interpretations of the data. An external audit was conducted by an expert in SAE research at [University] to establish dependability of the research methods in this study. Multiple researchers were involved in the design and data interpretation of this study to facilitate a reflexive research

design, adding confirmability to the study (Lincoln & Guba, 1985). The interview was recorded and transcribed directly by the interviewee and analyzed by the researchers of this study.

Findings

Four main themes emerged as we reviewed the transcript from the interview. The first theme identified was a lack of student SAE knowledge. When Daniel was asked what barriers did you have with participation in an SAE in high school he said "For the longest time, I never even knew I had an SAE. I started agriculture classes and being involved with FFA in eighth grade. It wasn't until I was a junior that I realized I even had one when my teacher said I should fill out a state degree application." The second theme emerged as a lack of teacher supervision time when Daniel went on to say, "Once my teacher and I had the conversation about what SAEs were, she wanted to come see my operation, but she never did come."

There was obviously some influence on SAE participation from the teacher, but we really wanted to know what some of the personal barriers were to participation. This led to the question "What were some personal barriers you had for participating in your SAE?" From this the third theme arose as a lack of student resources. Daniel said "Well I also wanted to show cattle, but I was stuck on a fish farm and doing fish stuff because that's what my parents did. I told them I really wanted to show cattle, but they said we can't afford to do that, and I needed to stay in school." Another interesting comment from Daniel was "I really had no motivation to have an SAE. It wasn't really talked about in ag class and I just happened to have one because I lived on a farm. It certainly wasn't a requirement for class, but hey, I got my American Farmer degree, so I guess it all worked out!" From this statement the fourth theme emerged; a lack of student motivation.

Conclusions/Implications/Recommendations

The case study interview with Daniel gave the researchers a wealth of information, not only on barriers to SAE participation, but on themselves. The SAE for All initiative from the National Council for Agricultural Education (2017) stresses the importance of an individualized SAE project. This can only occur if a good relationship between the agricultural education teacher and the student is established with particular detail given to SAE. The themes of this study support the findings of previous studies in the quantitative realm in the areas of lack of student knowledge, lack of teacher time for supervision, and a lack of student motivation to participate (Lewis, Rayfield, & Moore, 2012; Osborne, 1988; Steele, 1997; Wilson & Moore, 2007). This study gives rich detail as to how these barriers came to be with Daniel.

Several recommendations for practice can be made from the findings of this study. Agricultural education teachers should always teach their students about SAEs in the classroom. If Daniel had known about the different opportunities available to him, he may have had a different outcome with his SAE. Making SAEs a course requirement is essential to gaining student participation. Recommendations for further research included expanding the case study to include several students who had successful SAE experiences and determining what made the experiences positive. Finding teachers who are excelling in SAE supervision and reporting their view point would also be helpful to the profession and agricultural education community.

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Student-Teacher Interaction with Cooperating Teacher

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Student-Teacher Interaction with Cooperating Teacher

Introduction/Need for Research

There is a nationwide shortage of agricultural science teachers. According to Smith, Lawver, & Foster (2018), there was still a demand for teachers even after schools hired non-licensed individuals to teach agricultural education. Many studies have shown student teaching is a necessary experience to have (Briers & Byler, 1979; Byler & Byler, 1984; Hamman et al., 2006; Schumacher & Johnson, 1990; Schumann, 1969). This experience can also determine if they will stay in the profession and continue to teach (Kasperbauer & Roberts, 2007; Sorensen et al., 2018). With student teaching playing an essential role in the decision to remain in agricultural education, the experience needs to be beneficial. A significant portion of student teaching is the interaction the student teacher has with their cooperating teacher. This relationship is a pivotal contributor to the student teacher becoming successful in the future (Schumann, 1969). With over 1,000 positions to fill in 2018 and over 3,000 students enrolled in an agricultural education major, we should not have a shortage (Smith et al., 2018). Only 74.9% of students who graduated nationwide are teaching, according to Smith et al. (2018). Finding out why graduates are not pursuing a teaching position in agricultural education is essential. If the trend continues, more programs will be forced to close, and students will be affected. Educators are challenged to determine the reasons why graduates are not entering the profession (Kasperbauer & Roberts, 2007). Kasperbauer & Roberts (2007) notes that the issue to address is the quality of the student teaching experience with the cooperating teacher.

Theoretical Framework

Interactions between the student teacher and cooperating teacher are critical (Hamman, Fives, & Olivarez (2007). Granott (1993) proposed a theoretical framework keeping in mind the work of Vygotsky and Piaget. The interaction model created by Granott (1993) has two dimensions. The horizontal dimension represents the degree of collaboration, and the vertical dimension is the relative knowledge and expertise between the participants. Granott (1993) also created the collaborative interaction model that has nine sections describing collaboration and relative expertise. As a student teacher/cooperating teacher pair, the collaborative interaction would be ideal at scaffolding (Granott, 1993). That allows the student teacher to learn from the cooperating teacher and have guidance in the classroom. If a student teacher and cooperating teacher have an imitation relationship, the student teacher might not pursue a teaching position.

Methodology

The target population was the student teaching cohorts in 2017, 2018 and 2019 at Texas Tech in the Department of Agricultural Education and Communications. A study by Hamman et al. (2006-2007) provided the Learning to Teach Questionnaire, which looks at the interaction between the student teacher and their cooperating teacher. 26 questions were asked with a Likert-type scale to examine if interaction had an association on their decision to teach. The analysis for this research was quantitative in nature.

Results & Findings

The participants in this study were 71% female ($N = 32$) and 29% male ($N = 13$). Of the participants, 16% were from the 2017 cohort ($N = 7$), 31% from the 2018 cohort ($N = 14$), and 53% from the 2019 teaching cohort ($N = 24$). 64% of participants pursued an agricultural

teaching position ($N = 29$), while the remaining 36% of students did not ($N = 16$) for various reasons including graduate school or entered another profession. During the student teaching experience, 33% of participants had another student teacher present ($N = 15$), while 67% were the only student teacher with their cooperating teacher ($N = 30$). A majority of participants were at schools with two (38%; $N = 17$) or three cooperating teachers (31%; $N = 14$). 16% had only one cooperating teacher ($N = 7$) while the rest had four (13%; $N = 6$), and 2% had six cooperating teachers ($N = 1$).

A point bi-serial correlation was run to determine the association of the student teacher interaction with their cooperating teacher and the student teachers' satisfaction on their decision to teach. Davis (1971) was used to describe all correlations in the study. The correlation between student teacher interaction and decision to teach was moderate ($r_{pb} = .45$). The relationship between student satisfaction and decision to teach was also moderate ($r_{pb} = .31$).

Point bi-serial correlations were also ran to determine if five variables had a relationship with the student teachers' decision to teach. The correlation between the number of nights away at CDE contests was low ($r_{pb} = .27$). The number of CDE's attended was low ($r_{pb} = .26$). The correlation between number of nights away at stock shows was also low ($r_{pb} = .23$) and the number of stock shows attended was low ($r_{pb} = .23$). The lowest correlation was the student teachers' decision to teach based on the number of cooperating in the department, which was negligible ($r_{pb} = .04$).

Phi correlations were ran to see if gender or another student teacher present had a connection to their decision to teach. The correlation between gender and decision to teach was low ($r_{pb} = .27$), and the correlation between another student teacher present and decision to teach was low ($r_{pb} = -.26$)

Conclusions, Implications & Recommendations

Overall, the student teaching experience is vital to the student teachers' decision to teach. Both the student interaction with their cooperating teacher and their satisfaction with the experience had moderate correlations. Cooperating teachers need to be interacting at a high-rate with student teachers and eager to share their knowledge. Two-thirds of the decision to teach can be explained by the gender, student teacher interaction, if another student teacher was present, number of teachers, and number of stock shows and CDE's attended.

It is recommended that this study be repeated on a larger scale. With more participants included in the study, multivariate analysis could be employed to determine what impacts a student teachers decision to teach upon graduation. When university supervisors are selecting placements, it is recommended the potential for a high degree of interaction between the cooperating teacher and student teacher exists. Cooperating teachers who allow their student teachers to jump in, be part of the team and take responsibility is recommended. Cooperating teachers who are more personal and engage with their student teacher could increase the number of graduates entering the profession each year.

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Students' Perceptions of Problem-Based Learning in Undergraduate Courses

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Students' Perceptions of Problem-Based Learning in Undergraduate Courses

Introduction/Need for Research

As times change, students prefer different teaching methods (Hmelo-Silver 2004; McMay, Gradel, & Scott, 2013). They also have to obtain transferable skills, and students must be able to retain knowledge at a higher degree. Problem-based learning (PBL) is a teaching method becoming increasingly popular in multiple disciplines (Hawley et al., 2017; Savery, 2006). PBL is a pedagogy that allows students to guide their learning by solving real-life problems, engaging in critical thinking, applying course content, and working individually and collaboratively for the desired outcome of enhanced understanding (Barrows & Tamblyn, 1980; McMay et al., 2013; Sulaiman, 2010). It has become the preferred method in agricultural science courses, even though they have been implementing PBL due to the nature of the courses (Parr & Edwards, 2004). PBL goes back to the time of Dewey, Aristotle and Socrates. Dewey thought learning should be grounded in experience. Socrates modeled learning through questioning, inquiry, and critical thinking, while Aristotle was a proponent of learning by doing (Felder & Brent, 2016).

The Secretary's Commission on Achieving Necessary Skills (SCANS) (1991) lists critical fundamental skills as well as workplace competencies. These skills and competencies align with PBL and with what students can achieve while participating in a PBL course. Self-management, communication, decision-making, teamwork, professionalism, experiences, and leadership are the repeatedly top-ranked skills employers are looking for when hiring (Rosenberg, Heimler, & Morote, 2012).

Theoretical framework

PBL is a learner-centered approach that helps students apply knowledge and skills to develop a viable solution as well as to conduct research (Savery, 2006). Hmelo-Silver (2004) states PBL is a way to help students become active learners since it is simulating real-world problems. Elements of PBL are present in several other methods such as active learning, critical thinking, communication skills, creative thinking, and inquiry-based learning (Felder & Brent, 2016; Parr & Edwards, 2004).

According to Parr and Edwards (2004), students learn best when the subject matter is conducive to hands-on experiences. The PBL model (Hmelo-Silver, 2004), shows the steps students go through as they are engaged in PBL. This process allows for an outline of what the student can experience in a PBL course. Savery (2006) compiled a list from both the website for the PBL Initiative and the Southern Illinois University School of Medicine (2017) which includes the necessary steps to classify a lesson as PBL. The list states students must be responsible for their learning; it must be unstructured and allow free inquiry. The list from PBL Initiative and Savery (2006) website goes hand in hand with the PBL cycle by Hmelo-Silver (2004).

Methodology

The target population for this study included students enrolled in courses at Western Texas College in Snyder, Texas, during the spring semester of 2019. Eight instructors on campus were identified as teaching using the PBL method. The instrument used in this study was developed using three previously designed instruments. The Senocak (2009), Hawley et al. (2017), and Crawford et al. (2011) studies were used to create the complete questionnaire that was given to

the students at the end of the spring 2019 semester. The instrument included four sections with 65 questions rated on a 5-point Likert type scale. Analysis of this research was quantitative in nature examining students' perspectives, demographics, and employability skills.

Results/Findings

Objective one examined student demographics of those who completed the questionnaire. A majority of the students were female, with 66% ($N = 57$), while the remaining 34% ($N = 29$) were male. Sophomores were 55% ($N = 47$) of the respondents, while freshman were 42% ($N = 36$) and 3% ($N = 3$) were juniors. More than 81% ($N = 70$) of the students plan to transfer to a university after graduation. The remaining 17% ($N = 15$) plan on entering the workforce after graduation.

The second objective dealt with the PBL environment. A mean of 3.94 was calculated for the PBL environment meaning that often the students are participating in the 23 items from the Senocak (2009) study. Students' sometimes prepared a portfolio during the course and had the lowest mean of 3.12 ($N = 66$). When students were given a task, they often ($M = 4.43$, $N = 67$) completed all group tasks.

Objective three addressed the seven employability skills employers want. 59 subjects completed this section of the instrument. Communication skills had a mean of 4.26, so students agreed they gained this skill by being in a PBL course. Students' agreed teamwork ($M = 4.21$), decision-making skills ($M = 4.17$), leadership ($M = 4.17$), self-management ($M = 4.13$), experiences ($M = 4.11$), and professionalism ($M = 4.07$), skills were gained.

63 completed the section designed to determine overall perceptions of PBL. The overall grand mean for the students' perceptions of PBL was 4.13. They agreed PBL was beneficial to them. Students agreed most when PBL was used in the course; it made the discussions and the subject matter more relevant and realistic ($M = 4.21$). The item with the least agreement assessed the degree to which PBL integrated material from the course ($M = 4.03$).

Conclusions, Implications & Recommendations

Overall, students preferred the PBL method. Respondents perceived they were able to gain employability skills such as communication, teamwork, and leadership. Professionalism, experience, and self-management skills need to be improved according to the respondents. Students enrolled in PBL courses felt like they did not have an increased understanding or interest in the course material. Students agreed instructors should use the PBL method again. With some adjustments to the courses, students will receive more significant benefits.

Recommendations from the study are instructors who are currently teaching using the PBL method need to improve the PBL environment. Allowing respondents to share their results with group members and conduct evaluations of member's performances would enhance the PBL environment. Solving problems with different solutions would also help. Studies should be done to determine if students are retaining more knowledge when enrolled in a PBL course. Looking at PBL on a broader spectrum would be beneficial to the profession to distinguish if students prefer this method. If the students prefer PBL, then looking at how to encourage and teach the instructors to use this method would be necessary.

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The Correlation Between Students Accessing Guided Notes and Total Scores in an Agricultural Communications Course

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The Correlation Between Students Accessing Guided Notes and Total Scores in an Agricultural Communications Course

Introduction/ Need for Research

Lecture is the recognized as the most commonly utilized methods of instruction in higher education (Benjamin, 2002). "Note-taking is perhaps the most crucial skill used to assist students to understand and learn content during lectures" (Boyle & Rivera, 2012, p. 131). As critical as the skill of note taking is to lecture information recall, many postsecondary students report finding the task difficult (Rachal, Daigle, & Rachal, 2007).

Guided notes are intentionally incomplete lecture outlines the instructor provides to the students before the class session. The students may fill in the outline with key concepts, terminology, summaries, and questions as the information is presented during lecture (Stringfellow & Miller, 2005). Previous research has been positive, but not conclusive as to whether provision of guided notes results in increased academic performance (Cardetti, Khamsemanan, & Orgnero, 2010; Machida, Chin, & Johnson, 2018). Konrad, Joseph, and Eveleigh (2009) suggested that although studies concerning guided note taking have overall positive results, additional studies should be conducted across diverse populations, levels of schooling, and study areas.

The purpose of this study was to determine if there is a relationship between students accessing guided lecture notes and their total score in a non-major, agricultural communications course at [university].

Conceptual Framework

Working memory resources are in high demand while students are taking notes as they are multi-tasking, a complex cognitive task involving maintaining information in memory while also recording different information (Bui & Myerson, 2014; Bui, Myerson, & Hale, 2013; Engle, Tuholski, Laughlin, & Conway, 1999; Piolat, Olive, & Kellogg, 2005). In alignment with cognitive load theory, working memory resources are limited and should be prioritized to facilitate development of necessary schemas stored in long-term memory (Sweller, 1999). When working memory is full or overloaded, new information cannot be comprehended, so note-taking should reduce cognitive demand (Sweller, Van Merrienboer, & Paas, 1998).

Guided notes indicate to students when and where to record important information, in theory reducing cognitive load, leaving more space to process information presented in the lecture (Sweller & Chandler, 1991). Providing guided notes to students has been shown to improve note taking quality and academic performance (Austin, Carr, & Lee, 2004; Lazarus, 1993). The more frequently a student takes notes, and the higher the quality of those notes, the better the student's academic performance (Boyle, 1996; Hayati & Jalilifar, 2009; Hughes & Suritsky, 1994).

Methodology

If the instructor for the course in this study was leading the lecture, the guided notes were uploaded to Blackboard (learning management system) the day before class as a .doc file. This resulted in 24 guided notes provided to the students during the semester. Statistical tracking was turned on for these notes at the time they were uploaded to Blackboard, ensuring all student access to the file was recorded. Students were not required to access the guided notes provided. The guided notes file could be printed off and written in or opened electronically and typed into during class.

After the conclusion of the course, a statistical tracking report was run via Blackboard to show if each student accessed each guided notes file the day before or the day of the associated class session. The number of times a student accessed the notes was divided by 24, the total number of guided notes available, to reach percentage of instances the student accessed the guided notes. There were 1,000 total points available in the class, so the student's total points earned were divided by 1,000, then multiplied by 100 to arrive at the student's total score percentage. These two continuous variables were used to conduct a bivariate correlation analysis to assess if the percentage of instances a student accesses the guided notes covaries with the student's total score percentage in the course.

Results

The course had 94 students enrolled who on average accessed 7 (30.67%) of the 24 available guided notes. Student access to the guided notes ranged from zero, or no access, to 23 of the guided notes files (95.83%). The average total score percentage was 85.49%, with total scores ranging from 19.50% to 94.60% in the course.

Bivariate correlation analysis using Pearson's *r* revealed a significant, positive relationship between student ($N = 94$) total course score percentage and percentage of guided notes accessed throughout the semester, $r = .221$, $p = 0.032$. Davis (1971) classified this as a low level of correlation. A review of the data shows as guided notes access increases, so does the student's total course score.

Conclusions

Results indicated there is a relationship between students accessing guided lecture notes for a course and their total score in the course. However, results should be interpreted cautiously as Davis (1971) classified this correlation as low. Providing guided notes to students is one way instructors can help students achieve higher academic performance, should the student decide to utilize the resources provided.

Recommendations

Instructors are encouraged to provide guided notes to students in advance of class sessions as a means of lessening load on the working memory of students. This should assist the student in prioritizing working memory for interpreting key concepts and main topics, thus encouraging development of long-term memory and enhancing academic achievement. Guided notes are loosely defined as an outline of a lecture and come in various formats, so instructors should explore what format works best for them and their class.

Future research is needed to determine what extraneous variables might be affecting the correlation between students accessing guided lecture notes for a course and their total score in the course. In addition, a longitudinal study of providing guided notes to the same class over multiple semesters would provide additional insight into if the correlation holds across different student subgroups.

The results of this study are limited to those enrolled in the agricultural communications course under review. This study does not take into consideration other extraneous variables that might affect the relationship between students total scores and the number of times they accessed guided notes during the semester.

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The Effectiveness of a Metacognitive Strategy during the Learning Process on Subject Matter Retention, Visual Attention, and Cognitive Allocation

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Introduction

A primary interest of teaching metacognitive strategies is to improve reading comprehension (Baker, 2002; 2008). Metacognition is an information process defined as "cognition about cognition' or 'thinking about thinking" (Flavell, 1979, p. 906). Practicing metacognitive reading strategies can positively change students' learning performance (Block & Parris, 2008; Peirce, 2003). Metacognition is an unobservable complex construct involved in an individual's affective and motivational states (Lai, 2011; Schraw & Moshman, 1995). Learners may not be easily aware of their cognitive knowledge and learning process monitoring, which results in difficulties to reflect the actual behavior during cognitive process without precise measurements (Veenman, Prins, & Verheij, 2003). Thus, assessment of metacognition has been a challenge for psychologists and educators.

Eye-tracking technology has been extensively used to explore moment to moment cognitive processes in reading comprehension (Raney, Campbell, & Bovee, 2014; Rayner & Raney, 1996). Measuring eye movement behaviors is one of the most precise methods to understand cognitive process (Rayner & Raney, 1996). Eye movement behaviors, such as fixation duration and fixation counts, can provide important evidence to reflect the cognitive process in a natural reading environment (Brunyé, Drew, Weaver, & Elmore, 2019). Recording eye movement behaviors can directly reflect the cognitive process involved in reading comprehension (Mason, Pluchino, & Tornatora, 2015).

The Survey, Question, Read, Respond, Recite, Record, and Review (SQ5R) strategy is a metacognitive activity that was proposed by Pauk (1984). The SQ5R strategy is purportedly an effective reading comprehension strategy (Lapp & Flood, 1986; Silberstein, 1994). Utilizing SQ5R can help learners become aware of learning and enhance the user's ability to monitor their behavior, and ultimately reach higher levels of thinking (Sangcharoon; 2010). However, there is a lack of evidence exploring the effectiveness of SQ5R metacognitive strategy through the use of eye-tracking measurements.

Purposes and Objectives

The purpose of this research was to investigate the effectiveness of a metacognitive strategy (SQ5R) based on the eye-movement reading behaviors during the learning process. Specifically, this experiment was to compare differences in eye-movement behaviors (fixation duration, fixation counts, and fixation duration percentage) before and after watching SQ5R metacognitive strategies video.

Theoretical Framework

This research was guided by the information processing theory. Miller (1956) used short-term memory and long-term memory to describe the information process. Short-term memory is fundamental cognitive processing of holding chunks of information (Miller, 1956). By utilizing metacognitive strategies, learners could store a portion of information into their long-term memory (Rayner, Pollatsek, Ashby, & Clifton, 2012). By implementing the information processing theory, the evidence of metacognitive information processing benefits were described in this research.

Methods

This quasi-experimental study involved a pre-test and a post-test of students at Texas Tech University Fall 2018. Participants read four passages (mitosis, meiosis, tracheophytes, and

bryophytes) presented on a computer monitor while their eye movements were recorded by Tobii Pro Eye-tracker software. Forty participants (N=40) were randomly assigned to a specific combination of two different reading passages. The intervention was a video that discussed how to use the SQ5R metacognitive strategy. Within the design, participants experienced eye-calibration, reading passage one, taking the pre-test, watching the intervention video, reading passage two, and taking the post-test. Key elements in each passages were identified as areas of interests (AOIs). The operational measures of visual attention and cognitive allocation were the average of fixation durations and average of fixation counts on AOIs of each passages. Fixations were operationalized as "eye movements that stabilize the retina over a stationary object of interest" (Duchowski, 2007, p. 46). Fixation duration was the time that participants' spent fixated on AIOs. Fixation count was the number of fixations on AIOs. Fixation duration percentage means were the period of time on AOIs account for the time period on the entire passage. Paired t-tests were conducted to examine the differences in participants' eye-movement behaviors (average fixation duration, fixation frequencies, and fixation duration percentage) before and after watching the SQ5R metacognitive strategies video.

Results

The results of pre-test and post-test scores indicated that students retained more information after they had been taught the SQ5R metacognitive strategy. The average of pre-test scores was 22.79 out of 100 points (M = 22.79; SD = 26.94), the average of post-test scores was 54.35 out of 100 points (M = 54.35, SD = 32.34). There was a significant difference between pre-test and post-test scores, $t_{(39)}$ =-4.67, p<.05. Students spent more time (in seconds) on the second passage (M =141.92, SD = 63.69) processing information after the intervention compared to the first passage (M =71.95, SD=22.30). There was a significant differences of average fixation duration (Seconds) on AOIs, $t_{(39)}$ =-3.91, p<.05, before intervention (M = 6.64, SD = 3.29) and after the intervention (M =10.79, SD = 6.65). The average fixation counts (frequencies) before the intervention was 28.03 (SD = 11.38), after the intervention, the average of fixation counts was 52.03 (SD = 39.36); there was a significant difference between them, $t_{(39)}$ =-4.94, p<.05. The fixation duration percentage on AOIs before the intervention was 11.35%, which increased to 19.86% after watching the video. Students spent more time on the second passage on both AOIs and entire passage, which indicated that students spent more time using the SQ5R strategy and retained more information.

Conclusions and Recommendations

In conclusion, students spent more time on the key elements of the passage (AOIs) to process information in deep levels after they watched the SQ5R metacognitive strategies video. This study provided the evidence of effectiveness of the SQ5R upon students' reading comprehension improvement. If students can be trained with metacognitive strategies, they will apply the reading strategies in their learning process to improve their performance. This study contributes relevant insights into the importance of metacognitive strategies and their relationships to reading comprehension. Given the role eye-tracking might play in future research developments on education instruction, researchers should utilize the records of eye-movements to better design instructional materials or procedures to increase reading comprehension. We believe future educators should adopt more metacognitive strategies to improve instructional effectiveness as reading is fundamental to learning.

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The First 48: The Early Crisis Facebook Response to the Fair Oaks Farms Undercover Animal Activist Video

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The First 48: The Early Crisis Facebook Response to the Fair Oaks Farms Undercover Animal Activist Video

Introduction

On June 4, 2019 at 1:16 p.m. (EST), the animal rights group, Animal Recovery Mission (ARM) released a video they called "Operation Fair Oaks Farms" (Animal Recovery Mission, 2019). The 12 minute, 23 second video depicted the experience an ARM member had during the time they went undercover as an employee at Fair Oaks Farms (FOF) in 2018. FOF is the largest diary producer in the state of Indiana, and one of the largest dairy farms in the United States (Fair Oaks Farms, 2019). The video depicts animal abuse, primarily focusing on the abuse of calves.

As crisis communications in agricultural-related crises have shown, (Irlbeck, Jennings, Meyers, Gibson, & Chambers, 2013; Opat, Magness, & Irlbeck, 2018; Palmer, Irlbeck, Meyers, & Chambers, 2013) an organization's messaging, two-way communication with stakeholders, and involvement with the media can be make-or-break during a crisis situation in terms of keeping/continuing not only customer support and loyalty, but profitability as well.

Today, consumers are less trusting of traditional media, and demand quick and timely responses in real-time and they prefer to have them from the organizations themselves, especially within the first 24 - 48 hours (Fulgenzi, 2018). Many times, the social media platform used most frequently to alert consumers of a crisis is Facebook, which has become a huge sounding board for many of those affected by agriculture crises (Opat et al., 2018). Further, Coombs (2015) points out the value social media holds during a crisis as it gives voices to a variety of stakeholders during a crisis. The AAAE National Research Agenda additionally highlights the need for agriculture to effectively communicate about safety, health, and welfare concerns many consumers have regarding agriculture (Roberts, Harder, & Brashears, 2016).

Conceptual Framework

Although many agricultural organizations tend to avoid being proactive with their crisis communication messages (Eyck, 2000), it is imperative for organizations to communicate immediately and constantly throughout a crisis, even if they have no new information or updates (Ulmer, Sellnow, & Seeger, 2007). Specifically, the U.S. Department of Health and Human Services (2014) urges organizations facing a crisis to be strategic and intentional with their messaging within the first 24-48 hours of the crisis, as this timeframe is the most threatening to the organization because of the level of chaos, public interest, and uncertainty.

"Today, the first 48 hours of a crisis are more critical than ever before" (Fulgenzi, 2018, p. 1). Although much literature has cited the importance of having a crisis communication plan prior to a crisis hitting (Irlbeck et al., 2013; Combs, 2015) this narrative focuses on the crucial first 48-hours of an agricultural crisis, which is something current literature lacks.

Purpose and Research Objectives

The purpose of this study was to explore public response to Fair Oaks Farms' crisis communication on Facebook regarding the leaked animal welfare video.

RO1) Describe public engagement of Fair Oaks Farms' responses to the animal activist video on Facebook within the first 48 hours of the crisis.

RO2) Describe the sentiment of most relevant comments to Fair Oaks Farms' responses within the first 48 hours of the crisis.

Methods

In order to address the research objectives, a quantitative content analysis was conducted. A researcher-developed codebook was developed to determine descriptive data regarding the posts made by the FOF Facebook page within the first 48 hours of the release of the video from ARM. The codebook identified the number of posts made by the account as well as engagement with each of the posts including reactions, shares, and comments. Further, the top-10 "Most Relevant" comments were content analyzed for sentiment and reactions. Opat, Magenss, and Irlbeck (2018) suggested analyzing the top 10 posts on Facebook when comments ranged in the hundreds or thousands. Further, Steede, Meyers, Li, Irlbeck, and Gearhart (2018) indicated human-coded sentiment more commonly represented true sentiment of social media content than computer coded sentiment.

Screenshots of each post were taken on June 13, 2019 after comments on the original, early posts had died down. Coder training was conducted and the researchers independently coded each post and comment. Coders achieved 100% agreement on each variable.

Results

Within the first 48-hours of the release of the undercover video, FOF released two statements on Facebook. The first statement came at 1:50 p.m. on June 5th, just outside of the 24-hour window. The second statement came at 8:05 a.m. on June 6th. The first statement received 17,000 reactions, 19,000 comments, and 30,000 shares. The second statement received 7,300 reactions, 9,300 comments, and 1,300 shares.

Engagement with the posts varied. Sixty percent of the top comments on the first post were positive toward FOF while 40% were negative. However, on the second post, 90% of comments were negative and only 10% were positive. Reactions to the comments on the first statement were primarily "likes," ranging from 297 "likes" to 2,900 "likes." However; "angry," "love," and "haha" received between 13 – 880 reactions. The second statement received considerably less reactions on the comments ranging from only 8 total "wow" reactions to 1,900 "likes."

Conclusions/Implications/Recommendations

Agriculture and natural resource industries tend to shy away from being active with the mass media and on social media, which can be detrimental to the public's perception of the organization, as often times they will begin to look outside of the organization for more information and news, which may lead them to come across inaccurate information (Eyck, 2000).

Crisis communications should be updated and frequent throughout the first 24-48 hours of an emergency to help mitigate confusion, panic, and further losses (U.S. Department of Health and Human Services, 2014). By understanding how the public is perceiving crisis issues, messages can be better developed to address the concerns of the public. Practitioners should use sentiment via comments and reactions on social media to guide crisis communication on social media within the critical first 48-hours of an agricultural crisis.

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Utah Teachers' Perceptions of Teaching Genetic Engineering in the Classroom

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Utah Teachers' Perceptions of Teaching Genetic Engineering in the Classroom

Introduction and Need for Research

A shortage of skilled college graduates exists in agriculture to fill agricultural career areas (Goecker, Smith, Fernandez, Ali, & Theller, 2015). Changes in agriculture influence an educator's ability to effectively teach agricultural topics, and variable beliefs about agriculture in the school community (i.e., students, parents, counselors) influence the number of students interested in agricultural careers (Boone & Boone, 2007; Thompson & Russell, 1993). Agricultural educators need to be trained with up-to-date information about issues and careers in agriculture, in order to attract more students to pursue careers in agriculture and to better prepare them for today's job market (Perkins, Sorensen, Hall, Dallin, & Francis, 2017). This study determines agriculture teachers' perceptions and intentions regarding the teaching of genetic engineering, addressing Research Priority Area Three by preparing individuals to work in a global agriculture and natural resources workforce (Roberts, Harder, & Brashears, 2016).

Theoretical Framework, Purpose, and Objectives

The theory of planned behavior (Ajzen, 1991) was utilized within the questionnaire to measure attitudes toward the behavior, subjective norms, and perceived behavioral control. All three elements contribute to intention, which ultimately leads to an individual's behavior. Based on this framework, the objectives of this study were to (1) determine if a professional development workshop on genetic engineering in agriculture produced gains in the teacher's knowledge, confidence/ability, and importance of genetic engineering; and (2) determine teacher behavior related to incorporating genetic engineering into their classroom curriculum.

Methodology

The professional development workshop was held on Utah State University's campus with 19 teachers from Utah within science or career and technical education (CTE). They participated in a one-day workshop about genetic engineering, hearing lectures on various topics and going on tours. Teachers were also provided resources, including agricultural curriculum in genetic engineering. At the end of the workshop, participants received a retrospective pretest posttest questionnaire to measure level of knowledge, confidence/ability, and importance before and after the workshop, as well as their attitude, subjective norms, perceived behavior control, and intention to integrate genetic engineering into their curriculum. Table 1 shows information about the constructs utilized in the study, including post-hoc reliability estimates for each construct. All 19 teachers responded to the survey.

Table 1
Survey Construct Reliabilities for the Study

Construct	Cronbach's Alpha	# of Items	Sample Items
Attitude about Genetic Engineering	.95	8	As an educator, I enjoy integrating genetic engineering concepts into the curriculum I teach.
Intention to Integrate Genetic Engineering	.91	8	I want to integrate genetic engineering concepts into the curriculum I teach.

PBC Related to Genetic Engineering Integration	.92	8	It is mostly up to me whether or not I integrate genetic engineering concepts into the curriculum I teach.
Subjective Norms about Genetic Engineering	.89	6	Stakeholders in my classroom expect me to integrate genetic engineering concepts into the curriculum I teach.

Results

Most participants were female (n = 17, 89.5%). For highest level of education, most only had a bachelor's degree (n = 10, 52.6%), six had a master's degree, and three had "some graduate work". A majority held a traditional teacher certification (n = 17, 89.5%), and two were alternatively licensed. Eight individuals taught in urban communities, seven taught in urban cluster communities, and only three taught in metro urban communities. None of the participants taught in rural communities. Mean age was 43.06 years. Years of teaching ranged from two to 28 years, with a mean of 11.24 years.

For objective one, analyzing the pre-test and post-test items using a paired samples t- test, each showed significant gains in knowledge (ΔM = 1.41, $t(18)$ = 6.921, p = .000), importance (ΔM = 1.71, $t(18)$ = 7.870, p = .000), and confidence (ΔM = 1.37, $t(18)$ = 5.229, p = .000) regarding the topic of genetic engineering. For objective two, participants were in some level of agreement with each construct (see Table 2). Participants had a positive attitude toward genetic engineering as a whole and a high intention to integrate genetic engineering in their classroom. They were slightly lower in their perceived behavior control related to integrating genetic engineering into their classroom and the subjective norms about genetic engineering.

Table 2
Attitudes, Subjective Norms, PBC, and Intentions of Genetic Engineering Instructional Integration among Educational Professionals

Constructs	*M*	*SD*
Attitude about Genetic Engineering	5.18	0.83
Intention to Integrate Genetic Engineering	5.09	0.62
PBC Related to Genetic Engineering Integration	4.72	0.77
Subjective Norms about Genetic Engineering	4.32	0.77

Note. Real limits: 1.0-1.5 = Strongly disagree; 1.5-2.5 = Disagree; 2.5-3.5 = Somewhat disagree; 3.5-4.5 = Somewhat agree; 4.5-5.5 = Agree; 5.5-6.0 = Strongly agree

Conclusions, Implications, and Recommendations

Participants had significant gains in knowledge, importance, and confidence through their participation in the genetic engineering professional development workshop. Professional development workshops should be used in the future, as they could be an effective way to disseminate information about emerging technology in agriculture. Because teachers agreed that they have control related to genetic engineering integration and have a higher level of intention to integrate, educational materials should be disseminated not only to agricultural educators but also to science and CTE teachers. Once equipped with updated information, agriculture teachers can relay this new level of knowledge and importance to their students and attract more students to the field of agriculture.

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Where Are They Now: A Longitudinal Analysis of SBAE Teachers in Utah

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Where Are They Now: A Longitudinal Analysis of SBAE Teachers in Utah

Introduction/Need for Research

When pre-service agriculture teachers graduate, do we know where they go? Are we sure they are becoming agriculture teachers? The purpose of this study is to describe the employment characteristics of agriculture graduates from Utah State University. Since 2000, the average number of graduates accepting school-based agricultural education positions is 58.5% (Lawver, Foster, & Smith, 2018). However, from 2014 – 2016 72.2% of eligible agricultural education graduates accepted teaching positions (Lawver et al., 2018). Lawver et al. found that 25.4% of graduates pursue other career opportunities including military, extension, production agriculture, agribusiness, graduate school and teaching other subjects. Similarly, Cartmell & Garton (2000) found that 47% of graduates gained employment in industries other than teaching. Kelsey (2006) found that 57% of women enrolled in an agricultural education program over a four-year period dropped out prior to student teaching and of those women who completed the program, 52% of them never taught. When graduates do enter the profession after student teaching, it is estimated that 40-50% of them will have left teaching by the five-year mark (Ingersoll, 2003). Teachers who do leave the classroom, tend to do so early on in their career (Grissmer & Kirby, 1997). When teachers leave the profession, there are costs associated with replacing those teachers. It is estimated these replacement costs are in excess of $2 billion/year (Alliance, 2005).

Theoretical Framework

Teacher Attrition Theory (Grissmer & Kirby, 1987) was used to inform this research. This theory predicts that patterns of teacher attrition will occur at higher rates among early career teachers and those approaching retirement, while mid-career teachers will leave teaching at a much lower rate. There are many factors that influence early career teachers which are specific to age, gender, stage of career, life cycle events like marriage and child rearing, and career patterns like movement to a better teaching job (Grissmer & Kirby, 1987). The tenant of human capital also influences teachers' decisions when they reach mid-career timing as they have invested time and resources which result in higher salaries and benefits such as retirement, thus discouraging movement outside their current teaching assignment or district (Grissmer & Kirby, 1987).

Methodology

This longitudinal research was conducted using pre-existing data of agriculture teacher education cohorts at one institution. These data were collected by agriculture teacher educators each summer by contacting recent graduates through follow up emails and phone calls. Names of teachers were cross-referenced with current state board of education school-based agricultural education teacher data to determine those still teaching. Data were analyzed using descriptive statistics, including frequencies and percentages. The objectives for this longitudinal research were: 1) Describe the rate of SBAE teacher retention in Utah longitudinally; and 2) Describe SBAE teacher employment characteristics for Utah over the past 15 years.

Results/Findings

From 2004 - 2019 175 students graduated from the agricultural education Bachelor of Science teacher preparation program at Utah State University. Of those who graduated during this timeframe, nearly 60% were female. We found that 78% of the graduates taught at least one year beyond student teaching and 50% are currently teaching SBAE (38% in Utah and 12% in other states). Currently, 62% of the teachers in Utah are female while the majority of those teaching out of state are males (57%). Among the graduates not teaching, 7.4% are working in education outside of teaching (e.g. administration, higher education, extension), 14% are currently employed in a field outside of education, and 12% are currently not employed. Over the 15-year period, 12.4% of graduates never taught (Figure 1). The vast majority of graduates, more than 87% from 2004 to 2018 went on to teach at least one year in SBAE after student teaching with 2014-2018 having more than 93% who taught after student teaching.

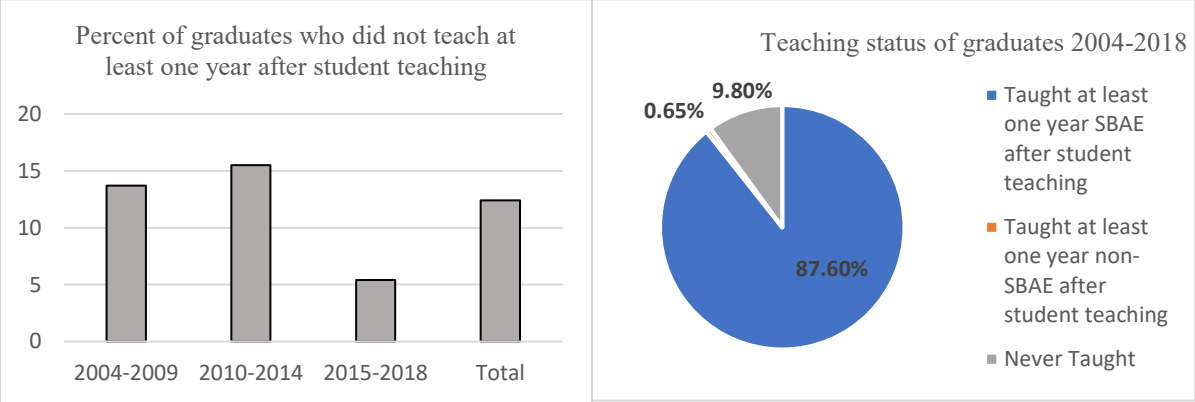

Figure 1. Fifteen year teaching status of graduates from Utah State University

Conclusions/ Implications/ Recommandations/ Impact on Profession

The purpose of this longitudinal analysis was to describe the employment characteristics of agriculture graduates from Utah State University. Although just more than half of the graduates are currently teaching, a majority of them stayed in state to teach. While 60% of the overall graduates were female, most of those who left to teach out of state were male. With 78% of graduates teaching at least one year after student teaching, we must ask ourselves why are only 38% currently teaching in Utah. Though not a remarkable amount and far less than Kelsey (2006) found, 8.6% never taught after completing the program. Why do students complete the program and student teach, then never become agriculture teachers?

Teacher attrition theory suggests that teachers who enter the profession, then leave, will often leave in their early years prior to investing time and resources into those careers. With the extremely high replacement costs associated for teachers who leave the profession, retention should be a principal concern for states and teacher preparation programs. While this research is limited to teachers in Utah, it informs teacher preparation programs as well as those who work with new in-service teachers. We recommend future research to track graduates of agriculture education programs to better understand the movement of teachers, where they go upon graduation, and why they may leave the profession.

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Where Everybody Knows Your Name: Cheers to Extension Television

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Where Everybody Knows Your Name: Cheers to Extension Television

Introduction

Extension subject-matter specialists are typically state-level employees tasked with providing support to county level programs, guiding programming, and connecting research efforts with local needs (Woeste & Stephens, 1996). Increasingly, mass communication through electronic formats is a job expectation for these individuals. As an educational tool, video allows an audience to self-direct their interaction in both scope and time (Schober, Selaa, Fernandez, Ferrell, & Yaroch, 2016). Research has shown that watching television is a preferred method of learning scientific information (Boellstorff et al., 2013).

Although limited research exists on the effectiveness of video programming in advancing the mission of Extension (Rockwell & Randall, 1987; Wagenet et al., 2005), little can be found that explores the participation impacts on the careers of Extension specialists.

Theoretical Framework

The guiding theoretical framework for this study was cultivation theory as it interacts with the construct of source credibility. The theory states that increased media use will shape a viewer's perception of reality to more closely align with the vision of reality presented through video (Gerbner & Gross, 1976). Source credibility may be defined as the "communicator's positive characteristics that affect the receiver's acceptance of a message" (Ohanian, 1990). Ohanian further proposed a construct of expertise, trustworthiness, and relatability to measure source credibility (Ohanian, 1990) built on two general theories: the source-credibility model and the source-attractiveness model. Pfau, Mullen, Deidrich, and Garrow (1995) found that cultivation theory and source credibility work in concert to craft public perceptions of those representing industries with limited public exposure. Agriculture is one such identified industry (Beam, 2017). Cultivated perceptions of Extension specialist's credibility are thus expected to affect interactions with Extension clientele and enhance the effectiveness of Extension specialists.

Purpose & Objectives

The purpose of this study was to document the perceived relationship between Extension audiences and Extension specialists who regularly participated in video communication over many years.

Methods

A case study was designed involving telephone interviews of Extension specialists who have regularly contributed to a land-grant produced broadcast program over long periods of time. The SUNUP television program produced by the Oklahoma Cooperative Extension Service and Oklahoma Agricultural Experiment Station was selected for study. This program was broadcast on the statewide PBS network from 1986-2004 and 2008-present. Three individuals were identified for interviews: all Extension specialists who had each contributed on a weekly or bi-weekly basis over the past 30 years. Each maintained an Extension role requiring in-person engagement with Extension clientele at local meetings during that same timeframe. These individuals were selected as they have frequent recurring experiences which occurred over a lengthy period of time. Each is known to carry the trust of their peers, the ag press, and Extension clientele. They are identified here as *Specialist 1*, *Specialist 2*, and *Specialist 3*.

Findings

Specialist 1 said being a known presence from television proved beneficial when he would first meet an Extension client. “It gives you name recognition,” he said, “. . .and because you're on the radio or you're on TV or you're in the press, you've got to be credible or you wouldn't be there. It gives you notoriety and it gives you credibility.” However, *Specialist 3* suggested the audience reaction went beyond recognition, “People would call you by your first name rather than just being Dr. [*Specialist 3*].”

Specialist 2 said involvement with SUNUP improved the quality of conversations he has with in-person audience members. “Broadcast exposure allows me to maintain a stream of conversation with the producers that I see regularly,” he said, “I think it levers the time a little bit, in terms of there's not as much need to lay the ground work for a particular discussion when you have that ongoing stream of contact with them.”. *Specialist 2* attributes this to a sense of camaraderie that develops between the audience and those on the program. “It's not a sterile environment once you get this ongoing relationship,” he said, “I think there's more of a familiar approach where you're talking to friends. You're talking to almost to family in some cases, and it allows you to have that communication with them.”

Conclusions

Extension specialists interviewed here demonstrated improved career effectiveness through increased credibility and augmented producer engagement. The participants reported audience perceptions of each credibility component: relatability, trustworthiness, and expertise (Ohanian, 1990). Local producers appeared to feel increased familiarity and comfort with Extension specialists they saw them regularly through television confirming the cultivation effect (Gerbner & Gross, 1976). As a result, these television appearances were not seen as one-directional communication but rather as part of an on-going two-way conversation between producers and Extension specialists. It is important to recognize that although these effects are a product of television exposure, the results are observed in local, in-person meetings. Although these specialists stated mass communications was the most effective way for them to reach an audience, the combination of mass communication and in-person events is shown to produce powerful results.

Recommendations for Research

Going forward from this study, a quantitative instrument should be developed to examine such effects in Extension professionals participating with television and other programs in other states, in programs produced outside of Extension, and of those participating at varied frequency. Additional study is also suggested to examine these effects from the perspective of Extension clientele. Perceptions of Extension specialists at in-person events should be compared between those who watch broadcast programming and those who do not.

Recommendations for Practice

A recommendation of practice is for Extension specialists to partner with both Extension and non-Extension media in order to maintain a channel of communication with clientele. Use of social media and self-produced video may result in similar effects. Further, emphasis should be placed on professional development opportunities that broaden the content specialist’s communication skills. Both in-person and on-camera training is warranted.

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Who's talking anyway? An analysis of sources used by a St. Louis newspaper to communicate about Monsanto's dicamba-tolerant seed technology

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Who's talking anyway? An analysis of sources used by a St. Louis newspaper to communicate about Monsanto's dicamba-tolerant seed technology

Introduction/Need for Research

Weed management has long been an issue for farmers. In fact, a survey of South Carolina soybean farmers indicated improved weed control strategies was the number one request of university Extension and research efforts (Norsworthy, 2003). Seed and herbicide technologies play a key role in controlling weeds in crop production. However, many weeds quickly grow resistant to herbicides, and studies have indicated stakeholder concerns regarding herbicide remittance (Norsworthy, Bond, & Scott, 2013).

In response, agriculture seed and chemical company Monsanto began developing a dicamba-tolerant seed trait in 2008, despite risk associated with the herbicide dicamba (Dowell, 2017). Monsanto launched its dicamba-resistant cotton seeds in 2015, and dicamba-resistant soybeans in 2016 – both without a corresponding dicamba-based herbicide (Dowell, 2017). While excitement for the new technology was experienced in the beginning, problems began to emerge shortly after the new seeds were released (Dowell, 2017). The issues were lessened when the corresponding herbicides were approved by the EPA in late 2016 (Dowell, 2017).

The media can be helpful in educating the public about issues regarding science and technology. As agricultural technology can be prone to controversy (Nisbet & Huge, 2006), the sources utilized by the news media play an important role in what is communicated to the public (Andsager, 2000; Pan & Kosicki, 1993). Issues of science and technology are often met by reporters with little understanding of the issue, and the need to find reliable sources (Nelkin, 1987). The development and release of Monsanto's dicamba-tolerant seeds provides an opportunity to determine what sources were commonly relied upon during the lifecycle of a new agricultural technology. Given the role of the source in communicating issues of science, a study of sources utilized to cover this issue was warranted.

Conceptual Framework

Sources hold the potential to influence terminology and choice of words or phrasing selected by journalists for publication (Andsager, 2000). In working with journalists, sources share their viewpoints to help to design, construct, or impact an article's frame (Pan & Kosicki, 1993). For these reasons, journalists should strive to include appropriate expert sources from the associated field of study when covering scientific topics. However, journalists tend to select sources that favor economic growth (Andrews & Caren, 2010) and those individuals within close proximity of the news (Stempel, 1991).

Sources selected by journalists hold the potential to impact readers on a variety of levels. For example, the perceived level of source expertise is an important factor in the outcomes of strategic risk communication (Yuan, Ma, & Besley, 2019). Previous studies have examined source and expert types quoted in scientific news articles. For example, Conrad (1999) found that researchers, scientists, or activists involved in the issue were commonly used as sources. Quotes from experts helped "shape the news in two ways – indirectly by providing information, interpretation, and perspective, and directly by providing the quotes that enrich the story" (Conrad, 1999, p. 300).

Methodology

News articles printed in the *St. Louis Post-Dispatch* were analyzed by the researchers. Using Nexis Uni, articles were identified using the terms "dicamba" and "Monsanto." *The St. Louis Post-Dispatch* was selected for analysis for a variety of reasons. First, Monsanto is headquartered near St. Louis, and the *St. Louis Post-Dispatch* is the largest newspaper in the area and state (Agility PR Solutions, 2019). Secondly, local newspapers play an important role in covering local businesses (Riffe & Reader, 2007), and lastly, newspapers, more so than other media sources, dominate local business news due to their ability to devote resources to covering business news and complex stories (Riffe & Reader, 2007). The timeframe selected for analysis was January 1, 2008, to December 31, 2018 to encompass both the dicamba-tolerant seed and corresponding herbicide's development and use. After removal of one duplicate article and three editorials from the dataset, the lead researcher analyzed the remaining 53 articles to determine source types. Relevant sources included any person or organization quoted or cited within the articles.

Results

The analysis revealed 11 different source types throughout the 53 articles. While many sources appeared to be referenced several times within different articles during the timeframe under investigation, sources were cited throughout the dataset a total of 155 times. Monsanto sources were most commonly cited (n = 39), and included senior-level leaders, named spokespersons, product leads, and unnamed sources. University scientists were the second most common sources, appearing 27 times. The University of Missouri appeared within the articles 15 of these 27 times, but nine other universities were also included. The third most common source was the farmer (n = 25). Other sources included financial analysts (n = 18), governmental agency representatives (n = 9), farm organization representatives (n = 8), activist groups (n = 8), other chemical companies (n = 8), outside attorneys (n = 7), agricultural industry spokespersons (n = 4), and elected officials (n = 2).

Conclusions & Recommendations

As previous studies have indicated, journalist tend to seek sources within close proximity (Stempel, 1991) and those associated with economic growth (Andrews & Caren, 2010), it is not surprising that Monsanto sources were the most commonly cited throughout the dataset. The prevalence of Monsanto representatives as sources could also be an indication that the company sought to influence the message frame (Andsager, 2000). The second most common source, university scientists, was consistent with Conrad's (1999) study that suggested journalists tend to rely upon researchers and scientists for scientific news articles. Finally, the journalists' use of farmers as sources was likely done in efforts to share a viewpoint of an impacted stakeholder in the issue (Pan & Kosicki, 1993).

Scientific issues tend to follow a pattern in the news media with positive coverage early on, but increased negativity and conflict over time (Cacciatore et al., 2012). As Monsanto's dicamba-tolerant seed and herbicide products progressed through a cycle of early innovation to problem resolution, future research should investigate Monsanto's media responses at different points in time. Additionally, the *St. Louis Post-Dispatch* relied upon a variety of sources to report upon this issue. Future research should investigate the degree to which media outlets rely upon the same, or different sources over time.

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