Poster Session Proceedings

Western Region Conference of the American Association for Agricultural Education
September 25-27, 2017
Fort Collins, Colorado

Seventy-four posters were received with 25 in the innovative idea category and 49 in the research category. Eighteen innovative posters were accepted (72% acceptance rate), with one innovative poster withdrawing after acceptance. Thirty-two posters were accepted for research (65% acceptance rate).

Poster Reviewers

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

Name	Institution
Arnold, Shannon	Montana State University
Baker, Marshall	Oklahoma State University
Buck, Emily	The Ohio State University
Carraway, Candis	Washington State University
Clement, Haley	Oregon State University
De Lay, Ann	California Polytechnic State University, San Luis Obispo
Dormody, Thomas	New Mexico State University
Easterly III, R.G. (Tre)	New Mexico State University
Enns, Kellie	Colorado State University
Frazier, David	Tarleton State University
Frost, Keith	Texas Tech University
Hanagriff, Roger	Texas A&M University
Hock, Gaea	Kansas State University
Irlbeck, Erica	Texas Tech University
Kennedy, Lindsay	Texas Tech University
Kieth, Lance	West Texas A&M University
Lawver, Rebecca	Utah State University
Leggette, Holli	Texas A&M University
Martin, Robert	Iowa State University
McCubbins, O.P.	Tennessee Tech University
Meyers, Courtney	Texas Tech University
Myers, Brian	University of Florida
Odom, Summer	Texas A&M University
Perry, Dustin	Montana State University

Ramsey, Jon	Oklahoma State University
Ricketts, John	Tennessee State University
Rubenstein, Eric	University of Georgia
Smith, Kasee	University of Idaho
Sorenson, Tyson	Utah State University
Spiess, Michael	California State University, Chico
Stewart, Josh	Oregon State University
Swafford, Marshall	Eastern New Mexico University
Swan, Benjamin	California Polytechnic State University – San Luis Obispo
Ulmer, Jonathan	Kansas State University
Warner, Wendy	North Carolina State University
Williams, Robert	Texas A&M University – Commerce

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Innovative Idea Poster Abstracts

"What do you think?": Demonstrating Inquiry-Based Instruction Using Wisconsin Fast Plants®

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Introduction/Need for Innovation or Idea

Defined as "the scientific process of active exploration by which we use critical, logical, and creative thinking skills to raise and engage in questions of personal interests" (Llewellyn, 2002, p. 26), inquiry as a method of instruction has been emphasized by science education and agricultural education researchers as an effective means for raising student achievement (Parr & Edwards, 2004; Thoron & Myers, 2011). The 2015 National Assessment of Educational Progress (NAEP) showed that 88% of 12th-grade students scored below the proficient level on the science assessment, revealing no significant change from 2009 scores (USDE, 2015). Thus, Oklahoma State University teacher-education faculty recognized the need to introduce pre-service teachers to effective inquiry-based instruction (IBI) strategies in an agriscience context.

There is a seemingly endless amount of activities that can be used within IBI, many of which commonly require increased time for preparation and understanding on behalf of the teacher (Blythe, DiBenedetto, and Myers, 2015; Wolpert-Gawron, 2016). The Fast Plants® life cycle kit and manual can alleviate instructors' time spent planning and gathering materials, and provide tools for teaching a variety of biology lessons using IBI. According to the Fast Plants Manual (2011), "By looking at the life cycle of Fast Plants from the perspective of the stages of growth and development from seed germination to seed production, students can understand the nature of the dependency among organisms and their environment" (p.1).

How it Works/Methodology/Program Phases/Steps

Oklahoma State University's Methods of Teaching Agricultural Education course introduces pre-service teachers to a variety of methods and strategies for instruction, including inquiry-based instruction. A goal of the course is to demonstrate a useful example of each method to the pre-service teachers. The inquiry-based learning cycle typically must take place over an extended period of time throughout the semester. Under ideal conditions, Fast Plants can complete their life cycle and produce seeds in as little as 40 days (Teaching with Fast Plants, 2011). The Fast Plants life cycle kit can be used to facilitate 12 different inquiry-based activities within the five chapters of the Fast Plants manual on each major stage of plant growth consisting of (a) germination, (b) growth and development, (c) flowering, (d) pollination, and (e) fertilization to seed. Each student in the methods course was able to grow plants in four different containers to provide unique treatments to test plant growth.

During each activity in class, students were given the opportunity to practice observation, experimentation, and data collection and analysis with their plant subjects. With the exception of some germination activities in the first week, the remaining activities could be carried out with the same set of plants. The plants were placed within an indoor, GROWLAB compact garden that included a grow-light, and moisture grid to provide water to plants on the weekends. At the conclusion of the plants' life cycle, students were given the opportunity to share their findings and experiences from the inquiry activities.

Results to Date/Implications

In the fall semester of 2016, Oklahoma State University began utilizing the Fast Plants life cycle kit in the Methods of Teaching Agricultural Education laboratory section. Equipment adopted for use by the lab was one Fast Plants life cycle kit, GROWLAB II compact garden, and *Teaching with Fast Plants Manual*. To date, a total of 31 pre-service teachers in two different Teaching Methods courses have used Fast Plants curriculum to conduct nine of the 12 life cycle activities. These activities have given students experience in growing their own plant subjects through an entire life cycle, many of which reported to have little or no experience in plant science based lessons. Pre-service teachers in the course were also assigned to teach using an inquiry-based activity, and many reported in their reflections to be more comfortable with the method as a result of their participation in the Fast Plants activities. At least three students from the Fall 2016 course subsequently utilized the Fast Plants curriculum at their student teaching centers in the spring semester.

Future Plans/Advice to Others

Faculty involved with the teaching methods course plan to build upon the success of Wisconsin Fast Plants as a model for IBI. Oklahoma State University recommends the use of the Fast Plants curriculum and materials to other universities as an affordable, time-saving way to foster inquiry-based instruction in a plant science context at any time of year. Course instructors should familiarize themselves with the manual activities and lab instructions prior to teaching pre-service teachers. Outdoor planting or greenhouse space is not necessary with the purchase of a grow light or indoor garden laboratory. Course instructors may choose to adapt their lessons based on number of students and schedule for course. Each activity and chapter of the Fast Plants curriculum may stand on its own, so instructors are encouraged to evaluate each activity to determine what is appropriate for their course. Emphasis should be made to pre-service teachers to consider how they would apply the Fast Plants curriculum in a school-based agricultural education setting.

Costs/Resources Needed

To successfully facilitate the Fast Plants activities, a Wisconsin Fast Plants Life Cycles Kit, Teaching Fast Plants Manual, and Indoor GROWLAB or Plant Light House are recommended. A total budget of just over $400 is necessary to purchase all the materials for the Fast Plants activities, and an additional $62.50 is needed to refill the Fast Plants kit each semester. All of the materials used in Oklahoma State University's methods course were purchased through the NASCO catalog. An approximate cost for individual materials is summarized in Table 1.

Approximate Cost for Fast Plants Curriculum from NASCO catalog

Item	Price
Teaching with Fast Plants Manual	$55.95
Plant Light House (optional)	$147.95
GROWLAB II Compact Garden (optional)	$250.25
Wisconsin Fast Plants –Exploration of Plant Life Cycles Kit	$99.95
Refill Kit for Wisconsin Fast Plants Kit	$62.50

Note. Prices are from NASCO online catalog

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A Method for Determining Qualifying for Career Development Events

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A Method for Determining Qualifying for Career Development Events

Introduction

Career Development Events predate FFA (Tummons, Simonsen, & Martin, 2017) and have been a part of FFA since its inception. [State] has 45 Career Development Events (CDE) ([State] Agricultural Teachers' Association, 2016). Of these 36 are team events with three or four members per team. These CDEs are held at 10 major contests (more than 20 events) and a number of minor contests throughout the state between October and May. Teachers generally agree that CDEs support the mission of agricultural education (Lundry, Ramsey, Edwards, & Robinson, 2015). Registration for the major events has doubled over the past 8 years to over 23,000 members in 2016-2017. Unlike some states, the major contests are not regional and draw chapters from across the state. State finals occur at two universities at the end of this season. As the FFA membership grows a number of these contests have become impacted both at the state final events and at contests leading up to the state final events.

Impaction may be caused by limited facilities or time. For four contests, there has been a qualifying method used to determine participation in state finals. One method is to develop a ranking based on performance in at least three previous contests. Only the top ranked schools are allowed to compete in state finals. The ranking method had some problems in keeping the records and not all qualifying contests are of similar size and quality. The other method used is to have a partial contest with all teams and the performance in the partial (qualifying) portion determines if the team advances to complete the contest. Two contests currently use this method for state finals. However, there is no data to support the selection of the qualifying classes. While the latter method does not allow all FFA members to participate in a full contest it does allow more members to participate in the CDE. Croom et.al. (2009) found that FFA members value CDE events because they relate to their career choices; this is a good reason to look for methods to expand participation opportunities. This project was undertaken to develop a method of determining which portions (classes) of a contest would best predict the outcome of the contest, then test the selected class(es) as a qualifying round to see if the event management could be improved.

CDE events in [State] are all held with same day results and awards. A typical event begins at 8:00 AM and awards are presented before 5:00 PM. Commonly these events contain some form of practicum or skill demonstration. Holding a qualifying round must not only reduce the number of teams that completed the entire contest, but also reduce the time to complete the contest. A qualifying round must be scored quickly and accurately, as well as be easily administered. The Veterinary Science CDE was selected since it is heavily impacted with most contests limiting participation. The Veterinary Science CDE contains a mix of identification, tests, and practicum. The practicums (demonstrations) take time and facilities.

Methodology

Tabulations data was collected from three major contests over two years. In the past, Franklin and Armbrewster (2012) looked at tabulations data to determine regional performance. For this project individual performance for each section (class) of the contest and total score were used to run a correlation analysis. Additional combined classes were calculated and analyzed (table 1). There are expected to be variations in how each contest host presents the contest so multiple events were used. An analysis of each contest was performed to insure that the top 40 high individuals would be included if the top 80 contestants were qualified. Only the written test alone could not satisfy this measure (qualifying rank > 80).

Results To Date

The veterinary science contest tested the qualifying by using the ID portion (3 classes) to qualify 63 teams (250 contestants) at a large non-state finals event. No registration limit was imposed. The total identification was chosen by the contest host because it was highly correlated and in practical terms easy to administer. An important aspect in planning a contest with a qualifying round is that it is organized into two

separate contests. 20 teams (80 contestants) were qualified. The contest was started at 8:00 AM and tabulations were completed by 2:00 PM. This was several hours earlier than previous contests of this size. The contest advisor reported that the contest went smoothly and administration of the practicums was much quicker with fewer contestants. Tabulations of the practicum rubrics (hand totaled and entered) took less time.

Table 1

		Highest Qualifying Rank of the Top 40 high individuals				
	Correlation with	*Contest*				
	TOTAL Score	*1*	*2*	*3*	*4*	*5*
Total Score	1.000	40	40	40	40	40
Equipment ID	0.896	59	64	51	67	67
Parasite ID	0.862	56	69	50	57	*
Breed ID	0.875	74	74	58	60	*
Practicums I	0.649					
Practicums II	0.711					
Practicums III	0.634					
Written Test	0.683	89	100	91	88	100
ID Total	0.898	49	57	43	51	71
Breed/Parasite ID	0.908	58	66	47	66	72
Eq ID & Test	0.924	54	56	46	69	68
Contestants		104	112	115	110	132

* Parasite and Breed ID sections were combined in tabulations.

Future Plans

Tabulations data will be collected for other impacted CDEs to determine if portions of the CDE can be used for qualify rounds. The initial target CDEs will be ones that are currently impacted, that will benefit from a qualifying round, and have a reliable class or classes that predict overall outcome. From this recommendations will be made to the state's teachers to use standardized qualifying rounds for impacted CDEs. The Small Engines and Floriculture CDE currently use a qualifying round and they will be analyzed to determine if the current qualification is a predictor of overall success in the event. It is important to note that the goal is to increase participation in the CDE so it is desirable that qualifying rounds include as much of the overall contest as practical. Consideration also must be given in how the contest is organized which includes factors such as facilities, tabulation methods, and rotations.

Costs/Resources Needed

The primary resource needed to complete the analysis is tabulations data for multiple contests. If tabulations are done electronically then data can be extracted and analyzed in a spreadsheet. For states considering this approach some prior planning may be needed to save data from regional and state contests. There are some potential fiscal impacts of using qualifying rounds to participating schools and event hosts. If all schools are allowed to register then they would be expected to pay registration fees. For some CDEs this is a nominal fee ($5-$7). For CDEs such as agricultural mechanics and floriculture there are significant material fees, typically, an extra $10-$20 per contestant funding the skills/practicum portion of the contest. This issue will need to be addressed as schools that do not qualify may resist payment and event hosts will not want to invest the time to process refunds.

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A Team Approach to Outreach Education: Connecting Industry and Academic Partners to Educate Generational Audiences

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Introduction/Need for Innovation or Idea

The agricultural industry plays a significant role in Montana's public and economic welfare. The economic impacts of agriculture can be seen in its services, enterprises, commodities, revenue, business taxes, and employment connected to the diverse industry sectors. According to the National Agriculture Statistics Service (2015), agriculture ranks as the number one industry in Montana with $5.3 billion in agricultural services and products. With a growing population and smaller agricultural enterprises, interest in specialty crops has been growing. USDA (2017b, p. 1) defines a specialty crop as, "fruits, vegetables, tree nuts, dried fruits, horticulture, and nursery crops… used by people for food, medicinal purposes, or aesthetic gratification." A large selection of specialty crops are commonly sold directly at farmers' markets, local restaurants, farm stands, and grocery stores in Montana.

With this increase in local production comes an opportunity for growth and partnerships between industry and academic partners. All current and future producers must be informed of changes in agricultural technologies, production practices, alternative markets, and consumer demand. Farm Service Agency (FSA) services and programs "provide American farmers and ranchers with a financial safety net while also helping to protect natural resources and enhancing food security" (USDA, 2017a, p. 8). University agricultural educators aim to create methods, models, and programs to inform public opinions and policymakers on agricultural and natural resource issues while also preparing students to work in the global workforce (Roberts, Harder, & Brashears, 2016). Typically, these organizations provide education to similar audiences independently. The approach in this project focused on collaborative planning, development, and implementation of events utilizing representatives from each organization to educate shared audiences on agricultural issues.

How It Works

This project targeted youth, college students, agricultural educators, extension agents, consumers, and urban specialty crop growers as generational audiences for outreach education. Project leaders and FSA specialists worked together to plan a series of year-long events to promote financial safety, environmental stewardship, and best production practices for generations of agriculturalists. The events were developed with input from academic and industry partners to familiarize audiences with financial, educational, and production activities integral to enterprises. Using this team approach, academic and FSA experts co-presented at 4-H and FFA conventions, farm field days, classrooms and farm activities, extension events, farmers' markets, and commodity conferences. Additionally, project partners worked together to develop a whiteboard animated video as a unique modern communication approach to promote key messages for FSA. The specific topics for events were agricultural education opportunities, farm operating and youth loans, and noninsured crop disaster assistance programs. Topic selection was based on needs identified by the FSA office personnel, university agricultural faculty, and growth of specialty crop production within Montana.

Results to Date/Implications

Initially, FSA specialists conducted a training for all project leaders to become educated on relevant services and programs for target audiences. A yearlong work plan was then co-developed to include the following events: implementation of a realistic, sustainable crop production course, Farm Field Day activities, youth loan workshops for secondary agricultural teachers and extension agents, industry conferences, a campus farm tour, and a weekly booth at

local farmer's markets. All events were attended by an FSA specialist and an agricultural faculty member to promote both organization's goals and reach larger audiences. To date, ten events have been completed with an estimated 500 people reached.

Future Plans/Advice to others

There remains a constant need for outreach education of agricultural information and industry changes. Educational programs can address these issues and transfer relevant information to raise the agricultural awareness of audiences. Many agricultural organizations target similar audiences for outreach education and should look for potential opportunities to co-teach relevant information. In this project, different and new generations of audiences were reached using a variety of delivery methods and opportunities gained from a teaching partnership.

When pursuing partnerships, it was imperative to build relationships with team members early in the process to confirm project goals, time commitments, event attendance, and program content. Planning for the events took place early to reserve space, submit proposals, and prepare materials. Sufficient time must be integrated into the event timeline for review and approval from all levels of administration when partnering with a governmental organization.

Gaining support from all team members was a critical component to the success of this partnership. Faculty should consider these partnerships as highly desirable professional opportunities to advance scholarship, promote the academic program, connect with the industry, and stay current on agricultural issues. Larger, more diverse audiences were reached by promoting a team of experts who can speak on a variety of topics. Additional research on public knowledge of agricultural issues was also conducted in connection with events to further explore this educational approach. Ten more events will be conducted in the next year with hopes of reaching at least 500 more people.

Costs/Resources needed

This idea was funded by a USDA Farm Service Agency grant. Minimal costs for conference attendance and booth fees were incurred, while some were free for non-profits. A whiteboard and video scribing company was contracted to create a 90 second personalized, realistic animated video that is being used for promotion at events. Costs vary by video services chosen. Printing costs for promotional brochures, workshop information, FSA materials, and surveys was $200. Finally, resources provided by FSA included farm loan booklets, pamphlets, and stand-up banners that were utilized at all events in combination with academic information on agricultural education. Graduate students were utilized at all events to host booths, administer surveys, present information, and promote the academic institution at a rate of $15/hour.

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Agriculture by the Numbers: Using State Agricultural Data to Create a Localized Introduction to Agriculture Unit of Instruction

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Agriculture by the Numbers: Using State Agricultural Data to Create a Localized Introduction to Agriculture Unit of Instruction

Introduction/Need for Innovation or Idea

Food and fiber production systems impact critical matters like human health, environmental sustainability, community vitality, and career opportunities. In their synthesis of research on agricultural literacy, Kovar and Ball (2013) highlighted the need and rationale to increase the public's general knowledge and improve perceptions about agriculture. They pointed out people need to understand trends and changes in agriculture associated with population growth, animal rights, genetic engineering, and uses of land, water, chemicals, and hormones. The National Research Council recommended all people have a basic understanding of agriculture, including "its history and current economic, social, and environmental significance" (1988, p. 1).

School-based agricultural education (SBAE) programs play an important role in developing agricultural literacy. In fact, the vision statement generated from the initiative *Reinventing Agricultural Education for the Year 2020* stated, "agricultural education envisions a world where all people value and understand the vital role of agriculture, food, fiber, and natural resources industries in advancing personal and global well-being" (NCAE, 1999, p. 2). Curriculum standards for SBAE programs vary from state to state; however, it can be concluded the focus is to provide students a general and diverse understanding of the agricultural industry and career opportunities therein. There are, of course, benefits to emphasizing local aspects of curricular subject matter. Theobald (1997) espoused the importance of relating curriculum subjects to the community. He stated rural students, in particular, gain pride and allegiance to their home area when they learn more about its place in the broader world. It stands to reason, then, SBAE students would benefit from agricultural literacy education that includes information about agriculture in their community and state.

How it Works/Methodology/Program Phases/Steps

An undergraduate student majoring in agricultural education created the *Oklahoma Agriculture by the Numbers* curriculum unit as part of an individual, special problems project. The primary objective of the unit was to introduce SBAE students to the agriculture they see around their home and across the state. The target audience for the unit was first-year SBAE students; however, it could be used with other SBAE classes, as well.

Lesson content addressed major commodities produced in the state, including geographic regions of production, economic impacts, national rankings, and relevant statistical data. Lessons also provided information about the people involved in agriculture and career opportunities in the industry.

Content for the lessons came primarily from the annual *Oklahoma Agricultural Statistics* (2016) cooperatively issued by the National Agricultural Statistics Service and the Oklahoma Department of Agriculture, Food and Forestry. The report provides up-to-date agricultural production information in narrative, table and graphic formats.

Structurally, the unit was composed of a pre-test, four lessons, and a unit examination. The lessons were: (a) Overview of Oklahoma Farming Operations, (b) Livestock Production in Oklahoma, (c) Crops of Oklahoma, and (d) Your Future in Oklahoma Agriculture. Each of the four lessons contained a detailed instructional plan, student handouts, visual aids, worksheets, and a learning assessment instrument. The instructional plan was formatted using the lesson plan template used in pre-service courses by the Oklahoma State University agricultural education program. Visual aides ranged from PowerPoint® files to materials needed for student activities used in the lessons. The complete unit was bundled into a single, 106-page .pdf file. PowerPoint® presentations were in accompanying digital files.

Results to Date/Implications

The undergraduate student who crated the unit pilot tested it during his student teaching field experience. He taught the unit to an Introduction to Agriculture class and gathered data about the cognitive and affective impact of the instruction. An objective-based unit pre-test assessed students' knowledge about topics of the unit prior to instruction. At the conclusion of the instruction phase, a post-test was administered. The average score on the objective-based pre-test was 45.5% and the average post-test score was 91.5%. The vast improvement in this score indicates the unit has a positive impact on students' knowledge about agriculture in the state. A semantic differential instrument was administered to assess students' attitudes about Oklahoma agriculture before and after being taught the unit. Those data have not yet been analyzed.

Future Plans/Advice to Others

More data needs to be collected and analyzed regarding the effectiveness of the instructional unit. The student who created the unit will update the content and the next class of student teachers from the Oklahoma State University agricultural education program will be encouraged to teach the lesson and gather data from their students about cognitive and affective impacts. After any necessary modifications are made to the unit, it will be made available for teachers to download from a website.

A similar unit of instruction can be created easily in other states. Statistical data and other information about agriculture in each state can be obtained through USDA websites and state agricultural agencies. Information from those sources can be plugged in to the format of the *Oklahoma Agriculture by the Numbers* unit plan to develop a curriculum for other states.

Costs/Resources Needed

Costs associated with developing and teaching this curriculum were minimal. Sources of information used to create the unit content were available free of charge. The only costs were for materials used with student activities and printing of handouts, which totaled less than $50.

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An Application of Project Based Learning: Creating Award Recipient Highlight Videos for a College Honors Banquet

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An Application of Project Based Learning: Creating Award Recipient Highlight Videos for a College Honors Banquet

Introduction/Need for Innovation or Idea

The Texas Tech University College of Agricultural Sciences and Natural Resources (CASNR) hosts an annual awards banquet every spring semester prior to the conclusion of classes. Known as the Ag Honors Banquet, this event showcases the yearly accomplishments of the CASNR competitive and judging teams, highlights outstanding faculty and staff members, and recognizes an outstanding student from each of the six academic departments within the college. Traditionally, the outstanding students, faculty, and staff were recognized as part of the script for the banquet. Over the years, this event has declined in attendance and organizers wanted to make it more interesting for attendees without adding to the length. In 2016, students in a senior-level agricultural communications course, Convergence in Agricultural Media, were tasked with producing a series of videos to highlight each outstanding student from the academic departments for the Ag Honors Banquet. In 2017, students in the courses expanded these videos to include the outstanding staff and faculty award recipients.

The development of these videos is based on the Project Based Learning teaching method. Project Based Learning is an innovative teaching method in which students gain knowledge and experience by applying their skills to work for an extended period of time on an authentic, engaging and complex question, problem, or challenge (Buck Institute for Education, n.d.; Larmer, 2015). Another defining feature of Project Based Learning is relying on the teacher for facilitation but not direction (Moursund, 1999). In regard to the innovative idea described in this narrative, the authentic, engaging, and complex challenge was for these students in the course to plan, produce, and present interesting content for the banquet that showcased their skills and revamped the traditional honors banquet.

How it Works

The process to create the videos began when each department determined an outstanding student by early April. Additionally, in the spring and fall semesters, Student Agricultural Council representatives select outstanding faculty and staff members. After names of all selected outstanding students, faculty, and staff were submitted to the Dean's Office, the students in the course began the planning process.

The development of these videos was primarily at the discretion of the students, and the finished product was a two-minute video about each award winner. Each video featured an on-screen interview of the award recipients with typical questions being about their experiences in the college, favorite memories or traditions, and future plans. Another interview was conducted with someone who could speak positively about the award recipient. These interviews were then edited together in the final video. The students in the course maintained consistency in almost all of the production elements, including shooting, interview questions, graphics, framing, editing, and sound. The videos were evaluated for quality and consistency before being uploaded to the college's YouTube channel as a playlist. This playlist allows the videos to be found more easily during the banquet and provided a way to organize the videos each year.

Results to Date/Implications

In 2016, six videos were created for the banquet to highlight the outstanding students. This effort was so well received that in 2017, 10 videos were created to highlight the outstanding faculty and staff award recipients in addition to the outstanding students in each department. The integration of videos in the banquet has been met with praise, based on anecdotal evidence. Students said they appreciated learning more about the award winners and banquet organizers said the videos added variety and interest. The use of videos allows for more control of the timing because they are of nearly identical length. Although some recipients were originally hesitant to be interviewed, the use of the video was less intimidating than being asked to make remarks during the banquet. The videos are edited to positively feature the award recipients and also feature comments from a person who had been a significant influence in that recipients' academic pursuits. Records indicated banquet attendance increased by 48% from 2016 to 2017, with 120 people attending in 2016 and 178 attending in 2017.

Using Project Based Learning allowed students to gain several benefits from the specific activity of video development such as critical thinking/problem solving, communication, collaboration, and self-management (Larmer, 2015). The video development required students to make choices regarding the project. When the students were given input and control over aspects of the project, it created a sense of ownership, leading them to care more about the project and work harder (Larmer, 2015). Additionally, this method of teaching encourages critique and revision where students give, receive, and use feedback to improve their process and products (Buck Institute for Education, n.d.). This was certainly experienced as students worked together to create the videos and were often seen critiquing each other's work. Finally, students made this a public product because the videos were presented at the banquet, thereby demonstrating what they had learned to those outside the classroom (Buck Institute for Education, n.d.).

Future Plans/Advice to Others

This project has been completed for two years and will continue to be integrated in the course. This project has been a successful way for students to be involved in all aspects of video production – planning, interviewing, shooting, editing, and posting online. Although some changes were made from the first year to the second, one of the areas that continues to be a struggle is how to encourage students to showcase the award recipient's individuality while remaining within the timeframe and other required elements for consistency (i.e. filming, editing, sound, and quality of the videos). One way to do this is to assign one student to serve as the project manager or executive producer for the duration of the project.

Costs/resources needed

The primary resources needed for this type of project are video equipment. This includes cameras, tripods, microphones, and light kits when necessary. However, these types of videos could be created inexpensively using smartphones or tablets. Another necessary resource is video editing software such as Adobe Premiere Pro, Final Cut Pro, iMovie, or Windows Movie Maker. These can range in price from free (iMovie) to $20/month (student access to Adobe Premiere Pro). Finally, it is recommended to use YouTube or Vimeo to host these videos online so they can be shared on the students' social media channels, in addition to department or college use. It is free to establish a YouTube channel or Vimeo account.

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Back to School: The Development of a Water College to Encourage Adoption of Irrigation Management Practices

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Back to School: The Development of a Water College to Encourage Adoption of Irrigation Management Practices

Introduction/Need for Innovation

An estimated $20 billion worth of the world's food and fiber is produced in the eight states that span from Texas to South Dakota above the Ogallala aquifer (Little, 2009). With approximately 36,080 square miles of the Ogallala aquifer located beneath West Texas, the region's agricultural operations receive much of its water source from the Ogallala aquifer (Guru & Horne, 2000). The necessary and intense use of this water supply combined with the slow recharge rate (Marsh, Peterson, & Williams, 2003) has placed a great emphasis on conserving the water in the Ogallala aquifer.

Established in 2006, the Texas Alliance for Water Conservation (TAWC), is a non-profit organization with the purpose of educating West Texas farmers and ranchers about the most efficient water management techniques and ultimately initiate a behavioral change in how these producers use water for agricultural purposes. To accomplish its purpose, the TAWC uses a variety of communication and educational outlets to inform their target audience about water conservation. These activities include Field Days, Field Walks, board meetings, agricultural conferences, radio programming, and educational tools and information (TAWC, 2016). However, the most popular and largest TAWC event of the year is the Water College. This event is unique in the fact that it is led by producers teaching other producers, just as the TAWC is a producer-led organization. It is innovative in the way these producers are able to tie together aspects of technology, economics, and agriculture in order to educate other producers on best management practices.

The design for this event is draws from Mezirow's Transformative Learning Theory, which is based on the principle that personal experience is an integral part of the learning process (Mezirow, 1991). This theory suggests that a learner's integration of the experience creates meaning, which leads to change in behavior, mindset, and beliefs (Mezirow, 1991). The Water College is geared toward applying the third dimension of the Transformative Learning Theory, which is to create a change in behavior through epistemic codes and critical reflection (Mezirow, 1991). The goal of the TAWC Water College is to provide a positive learning experience that is conducive to facilitating a change in farmer's and rancher's behavior toward water conservation practices in hopes of increasing conservation technology adoption rates.

How it Works

Water College is an instructional meeting for producers, agricultural businesses, and consultants on the most current irrigation management technologies and research available. Since 2015, this event has been held every January in Lubbock, Texas. Water College is a daylong event and includes breakfast with registration in the morning and lunch with a keynote speaker. Experts discuss a variety of topics including water management in corn, cotton and grain sorghum, research results from TAWC research sites, and implications for cattle ranchers. The event is approved for continuing education credits required to become a certified crop adviser through the American Society of Agronomy. Additionally, Water College features a trade show of exhibits

displayed by local supply companies, farm equipment dealers, farm credit businesses, commodity groups, and state and federal government agencies. Having a trade show in conjunction with the informational presentations allows attendees the chance to learn more about concepts or technologies speakers discuss.

One of the unique aspects of this event is the use of sponsorships from local, regional, and national agricultural organizations and businesses to fund the event. This includes commodity groups, seed companies, irrigation technology companies, and farm equipment dealers. Sponsors can choose from four different levels of sponsorship: Platinum, gold, silver, and bronze level.

Results to Date/Implications

The event has grown in the number of attendees and sponsors since its development in 2015. For the 2017 Water College, the venue had to be moved to a larger facility to accommodate this growth. The number of attendees has risen from approximately 50 in 2015 to almost 200 in 2017. Attendee demographics have mainly been male, middle-aged producers, along with a variety of different agricultural industry members such as crop consultants, representatives from seed companies, and extension agents. As the event grows, it has attracted a more diverse group of attendees and sponsors. As the number of attendees increases, additional space may be necessary to accommodate both the information sessions and the trade show.

Future Plans/Advice to Others

Future plans include incorporating presentations about sustainability, organic farming, soil biology, and more efficient practices for maintaining dryland crops. The TAWC is also beginning Texas Agricultural Water Manager certification program in partnership with Texas A&M AgriLife Extension. This certification program's implementation is an effort to recognize and distinguish producers who are making resourceful decisions with their water application. Water College will be one of the main events where producers can obtain credits required for the certification. Advice to others who want to provide this type of event is to feature speakers who will present the information in an engaging manner and to provide some kind of incentive or encouragement for participants to attend and apply information learned. The TAWC does the latter by offering the continuing education and water manager certification credits, lunch, and by inviting producers to join the project after the event.

Costs/Resources Needed

The primary costs and resources needed for this event are the rental of a venue that will accommodate attendees, a stage for speakers, an area for trade show booths, and an area to serve food. Other costs include the meals, production and printing of event programs, notebooks, handouts, and certificates. Additional costs to consider are speaker fees and travel expenses. Currently, attendees do not pay to attend the event. The costs are paid for through sponsorships from agricultural organizations and businesses.

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Poster Type (Innovative Idea)

Cultivating Sustainable Agricultural Change in Ghana

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Introduction

The alleviation of global hunger continues to be a focal point for many agriculture-based non-profit organizations in the United States. The non-profit organization AgriCorps aims to address these challenges by connecting American agriculture professionals to the demand for experiential, school-based agriculture education in developing countries (AgriCorps, 2016). While efforts to address global food security issues often include enhancing education of the youth in developing countries (UNESCO, 2004), few projects have sought to educate native in-service agriculture teachers about positive benefits of agriculture education programs. Developing coursework to be delivered directly to Ghanaian agriculture teachers can aid in delivering content to communities that may typically be unserved. In addition, these practicing agriculture teachers have the ability to exponentially influence the lives of farmers and aid in creating sustainable change. While educational workshops for agriculture teachers are rare, the authors and AgriCorps Fellows set out to develop a three-day teacher training curriculum to be used to train in-service agriculture teachers in Ghana about experiential teaching and learning.

Methodology - Establishing the Innovation

We initiated change by developing a seven-session curriculum which identified topics, processes, and teaching strategies that the teachers, in their local schools, needed most. Together, the group identified five main topics needed for professional development: the importance of being a teacher, experiential learning theory, how to engage students in a classroom, problem-based learning, and modern classroom management strategies. These five topics were used to create seven workshop sessions. One session was created for each main topic, one for participants to practice implementing new techniques, and one summative session for participants to work in small groups to create and present a mock lesson utilizing new teaching strategies. As AgriCorps Fellows, we used our own agriculture knowledge as well as topics from USAID's School Garden Curriculum to develop each session. Once the curriculum was developed, a series of five, three-day trainings were hosted in the Eastern, Northern, and Ashanti regions of Ghana, West Africa. Participants included agriculture teachers from schools which housed an onsite AgriCorps Fellow as well as several non-agriculture teachers, school administrators, and 4-H Ghana staff.

Results to date

We developed a 28-page curriculum handbook complete with lesson plans and supplemental materials for the training. The project was successfully implemented in five, three-day trainings which included 81 participants from 14 secondary schools in Ghana. Each participant was given a complete handbook of the curriculum and was encouraged to not only implement the concepts taught at the training, but spread their new knowledge to their colleagues. Pre and post training surveys were administered to participants and demographic data, prior knowledge of the session topics, current teaching techniques, likelihood of adopting new strategies, and general comments on the training were collected. Survey data, observations,

and anecdotal evidence provided valuable insight into the success of the program and how it can be improved for future participants.

Future plans

The authors plan to continue to develop the teacher training curriculum as well as assist current AgriCorps Fellows with hosting teacher trainings in Ghana and Liberia during 2017. Authors are also open to sharing the tools with other educators, Ghanaian schools, and organizations that seek to provide professional development opportunities to teachers in West Africa. Through our research and experience, we recommend hosting the trainings at each school site rather than invite participants to a conference center or hotel banquet room so as to reduce costs and reach a larger audience. We also recommend condensing trainings to two days to increase participant numbers, host follow-up in-service trainings, and develop strategies to follow up with participants and determine if they have implemented the new strategies.

Costs

The use of time and internet credit was the main cost in developing the curriculum. The cost to implementing the teacher trainings included costs for transportation, lodging for participants and AgriCorps Fellows, catered meals for participants, rental fees for facilities, and printing and supplies costs. Table 1 shows total expenditures for each training. Fluctuations in expenses varied depending on training site, participant numbers, travel expenses, and cost of catering.

Table 1: Total expenditures for five teacher trainings during Spring, 2016

Training	*Total Expenses*
Odumase Krobo, Eastern Region	3,307 GHC*
Tamale, Northern Region	1,804.50 GHC
Pong-Tamale, Northern Region	191 GHC
Ejisu & Kumasi, Ashanti Region	1,574 GHC
Alma Mater, Ashanti Region	1,630 GHC
Total	8,506.50 GHC = appx. $2200.00[a]

[a]GHC stands for Ghana Cedi. 8,506 GHC is equivalent to approximately $2,200

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Empowering Students to Take Over a Department Snapchat Account

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Introduction/Need for Innovation

Ephemeral social media, platforms that allow users to share content for a limited period of time, have become prominent features of the social network landscape (Bayer, Ellison, Sarita, & Falk, 2015). Snapchat is a social media platform that allows users to send images, videos, and text with limited viewing time for the receiver(s), before it becomes inaccessible (Vaterlaus, Barnett, Roche, & Young, 2016). Recent estimates show that there are more than 158 million Snapchat users worldwide (Carson, 2017). Snapchat was rated as the third-most popular social media platform after Facebook and Instagram, with approximately 25 percent of young adults (18–29 years old) using the app (Duggan, 2013; Utz, Muscanell, & Khalid, 2015). As agricultural communications students enter the workforce, knowing how to leverage this social media platform will be an important skill set. Therefore, it is necessary to introduce students to the technology and how it can be used strategically for an organization. The purpose of this innovative idea was to provide students with an opportunity to plan, execute, and evaluate a Snapchat "takeover." Snapchat takeovers are a strategy that allows someone to gain control of a Snapchat account and provide content from that person's perspective.

How It Works/Steps

This innovative idea was implemented in a senior-level agricultural communications course at [university]. Students received instruction regarding how to create effective and engaging content on Snapchat. This was a participatory exercise as many of the students noted Snapchat was one of their favorite social media platforms. The course had 22 students who each identified a day they wanted to "takeover" the department's Snapchat account. Before receiving the login information for the account, they submitted an outline of the Snapchat story they would curate with at least 10 specific "snaps" identified. These could be photos or videos, but they had to represent the department in a positive light while sharing a story the audience would find interesting. The instructor then graded this outline and provided additional advice for the takeover. The student was then given the login information for the account.

Students were asked to promote their takeover on their personal social media accounts and provide content to share on the department's Facebook account regarding the takeover. On the day of the takeover, the instructor attempted to follow the takeover live. All students were required to save the story and take screenshots of their snaps. These were then submitted via the learning management system, along with a reflection of the Snapchat takeover experience. The instructor graded the Snapchat takeovers on creativity, accuracy, appropriateness, completeness, and encouraging audience engagement.

Results to Date/Implications

Per student reflection papers, the majority of students found the Snapchat takeover experience to be positive. The assignment presented an opportunity for students to use a social media platform for professional use, which required them to think critically about the content they were sharing and what message it would send to their audience members. The Snapchat takeovers featured departmental and college activities, agricultural association events, and behind-the-scenes coverage of daily happenings on campus. One student said, "Overall, this assignment stretched

me to creatively use a more personal social media platform for business uses." Students had to take into consideration who their audience was, and what content would be most well-received. "I made sure to make the content professional, but I also wanted to be entertaining because our followers are mainly college students," a student said.

It was also indicated that this assignment simulated real-world reporting and journalism, as the students were partaking in the events they were covering. Several students noted it was a challenging task to balance participation and documentation. One student explained: "It definitely gave me a taste of what many professional reporters, photographers and videographers have to do while on a typical job. Often, their jobs entail more than standing in the corner and getting the perfect shot."

The timeliness of Snapchat as an advantage was noted, with one student saying, "videos are posted instantly; videos are brief and hold a captive audience while they are playing, and the ability to add text to summarize a point is nice as well." Other student feedback included comments about using Snapchat as a way to connect on a more informal level with audience members, and how the timeliness made for a less formal effect when communicating to an audience. One student described the use of the app in a professional function as being able to be "more conversational and down to earth with your audience."

The students were optimistic that utilizing Snapchat in a professional manner would be helpful to any company to create positive rapport with consumers and clients. One student mentioned that upholding the reputation of the department was on the forefront of their mind, and that using correct grammar, spelling, and punctuation was important to maintain a good image for the university.

Future Plans/Advice to Others

This assignment will continue to be used in the course because students said it helped them practice using the platform for more than their personal use. Students were made aware of this project at the beginning of the semester, but several waited until the end of the semester to complete the assignment. This created some confusion as to who would have the account on certain days or timeframes, but only once did two students login at the same time. Students should receive instruction (and warning) regarding how to use Snapchat accordingly. Although it did not happen during the semester, it is possible that a student would forget to logout of the account and begin posting personal information on the department account. The outline students provided was an important part of the process because it helped them be more strategic about the event they presented, while also recognizing areas to be more creative.

Costs/Resources Needed

This innovative idea is free to implement. Snapchat is a free app available for both Apple and Android devices. In regard to resources, the department will need to create an account and the instructor will access to Snapchat to monitor what is being shared.

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History of Agriculture Course in an Agricultural Education Program

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History of Agriculture Course in an Agricultural Education Program

Introduction of the Idea

The importance of and need for agricultural literacy has continued to grow in the United States in recent years. This task is often the responsibility of agricultural educators, communicators, and extension personnel found within universities, public secondary schools, communities, and a host of other outlets (Enns, Martin, & Spielmaker, 2016). One strategy for helping university students become more agriculturally literate is offering a History of American Agriculture course as part of their program of study. However, courses specifically focused on American agriculture history are offered for students in a limited number of university agriculture programs in the United States (G. Moore, personal communication, December 1, 2016). Although this course is but one approach to enhancing agriculture literacy, the potential for future creation and adoption of such courses at other universities could enhance agriculture literacy on a larger scale.

Steps in Course Design

The History of American Agriculture course was taught at two different universities: Colorado State University (CSU) and the University of Tennessee at Martin (UTM). CSU initially developed the course during a one-year period, and it has been taught twice. UTM worked with CSU in developing key elements in a nearly identical History of American Agriculture course, and it has been taught once. The 16 week course had to gain approval from the university curriculum committee. The course was granted core content status as fulfilling student's history course requirement at CSU. UTM is in the process of gaining approval for the course to fulfill student's humanity course requirement. The following paragraphs outline the most unique features of this course at both universities: content and assignments.

The content of the course focused on three ideas. Frist, the course included content focusing on the historical introduction of different techniques and key milestones of agriculture in the United States. The time period included pre-Columbian agriculture through events in the 1980's related to agriculture in the United States. Second, the course included content that centered on agrarian ideas (ideologies) throughout American agriculture history. These included Jefferson agrarianism (late 1780-1850s), romantic agrarianism (1830-1860s), southern agrarianism (1930-1940s), neo- agrarianism (1970s-now), and agrarian populism (2000s-now). Finally, the course connected how past events are linked to the agrarian ideas of the era and how these ideas shaped the future of agriculture. The course had two textbooks (Danbom, 1995; Hurt, 2002). UTM also included a day long agriculture history field trip in which students experienced nearby historically significant persons, locations, and artifacts.

The other unique feature of this course was the assignments. In particular, the unique assignment for both institutions was an ongoing (semester long) "hands on" history project. Traditional history courses require end of the year historical research project. This appeals to some students. However, the designers of the course recognized that other students wanted a chance to engage in historical research in different ways. The course allowed students to choose from four different final project types:

1. Traditional historical research paper (at least 13 page paper)
   Example: The impact of the green revolution on farm sizes
2. Media Projects (Complete video, audio, print project with at least 4 page reflection paper)
   Example: Visual history of real cowgirls
3. Oral history project (Interview transcripts and at least 9 page paper)
   Example: Remembering when horses still ruled: A retired farmer interviewed
4. Historical restoration project (Work with restoration group and at least 3 page reflection)
   Example: Rebuilding the historic Joplin grain elevator

Results to Date

The course has been offered two times at CAU and one time at UTM. The students of the courses were very favorable of their experience. The ratings for the course at CSU were high, ranging between 4.42 and 4.84 (out of 5.00) for instructor and course ratings for the two offerings. The ratings for the course at UTM were similar, ranging between 4.25 and 4.65 (out of 5.00) for instructor and course ratings for the one offering.

Qualitative student feedback from both universities were generally positive as well. Students who completed the course described the course as "engaging to make the topics interesting" and "learning about the history of agriculture and how it has evolved over time." Students also found the experiential nature of assignments as appealing, describing the course as an opportunity to "experience the topics" as opposed to just hearing about them. Many of the students also appreciated the uniqueness of the final project which allowed them to do something more than just a traditional history research project. Some negative comments were also received from student completers. Some students described the scope and length of assignments as being "too much" or "too long" for a three-hour undergraduate course.

Future plans

College administrators want to increase the student capacity at both institutions so that the courses can be open to every freshman in the college of agriculture. The department head at UTM would like to create and offer a section of the course as a general elective for non-agriculture students. UTM will also offer this course as an online duel-enrollment course for high school seniors during the Fall 2017 semester. The timeline of scaling up this course depends on the resources of each department. Furthermore, expanding this course to the general campus community will require approval and passage by academic governing bodies.

Costs/resources needed

The financial cost of this course is fairly low as compared to any other course of study. The most expensive financial cost was the day long agriculture history field trip at UTM. The field trip cost was approximately $600 for using the university's 28 passenger bus to transport students to each location of the excursion. The real cost of this course in many cases would be dedicating a faculty member or instructor with the background knowledge and time to teach this course.

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Increasing STEM Major Persistence Using Undergraduate Research Programs

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Increasing STEM Major Persistence Using Undergraduate Research Programs

Introduction

While the number of Hispanic students enrolling in STEM fields is on the rise (Crisp & Nora, 2012) disproportionately low numbers of Hispanics persist in STEM majors (Young, 2005). Of the Hispanic students who began college in 2004 as STEM majors, only 16% completed a STEM degree by 2009 (Institute for Higher Education Policy, 2010). Documented environmental factors contributing to Hispanic student attrition in STEM fields include financial instability, family responsibilities, and full-time work commitment (Crisp & Nora). Hispanic students have positive attitudes and aspirations for STEM majors (Crisp & Nora) however, interest in mathematics and science have been shown to weaken as academic achievement in those classes decline (Peng, Wright, & Hill, 1995). Student satisfaction with the quality of instruction along with enjoyable coursework have been cited as leading factors in degree attainment (Barton, 2003; Eimers, 2001).

How it Works

This project, sponsored by the United States Department of Agriculture Hispanic Serving Institution (USDA-HSI) Educational Grant Program sought to increase the persistence of underrepresented students in STEM majors. Engaging underrepresented students in experiential learning opportunities in an undergraduate research program focused on sustainable agriculture, human nutrition, and healthy food preparation served as the foundation. Participating in undergraduate research programs, similar to this project, increase minority students' persistence in STEM majors (Herrera & Hurtado, 2011).

The project was a collaborative effort between the Agricultural Science, Human Nutrition, and Culinary Arts programs at Eastern New Mexico University. Participating undergraduates were employed in a variety of capacities in the greenhouse research facility, aquaculture laboratory, food science and culinary arts laboratories, and the Child Development Center at Eastern New Mexico University. Undergraduate students participated in projects focused on aquaculture and food research and production along with nutrition science and food and meal preparation and presentation.

Through the two-year project, the following steps have been taken to accomplish the three objectives set forth by the project staff:

Objective 1: Provide research assistantships and support to undergraduates enrolled in the Agricultural Science, Human Nutrition, and Culinary Arts programs at Eastern New Mexico University
To accomplish this objective, funding was secured for 10 undergraduate students for on-campus jobs focused on aquaculture and vegetable production, human nutrition science, and farm-to-table meal development and preparation.

Objective 2: Provide students with "hands-on" experiences that train the students to accomplish and master experimental processes from sustainable agriculture, human nutrition, to food preparation. Participating students, under the supervision and mentorship of university faculty,

participated in research-based production projects in aquaculture and horticulture, experiments in nutrition science and focus group analysis of food products.

Objective 3: To provide training in laboratory research procedures by engaging underrepresented students in research training programs. To accomplish this objective, participating students enrolled in laboratory-based courses to develop the research and production skills needed for sustainable agriculture and farm-to-table initiatives.

Results to Date

The project was successfully offered and undergraduate students were actively engaged in the research and production components. Undergraduate students completed research projects focused on vegetable production, vegetable acceptance by Pre-K students, and economic impacts of environmentally controlled aquaculture production in educational settings. Participating students presented their research at the Eastern New Mexico University student research symposium and the required USDA-HSI project directors' meetings. To date, all underrepresented students participating in the project are currently enrolled in their major or have successfully completed requirements for graduation. Recently graduated students have either secured employment or have been accepted to post-graduate studies.

Conclusions/Future Plans

This project has provided Eastern New Mexico University with the tools necessary to build the infrastructure to engage underrepresented students in research-based experiential learning programs that support persistence in STEM degrees. This project has proven to be successful in providing underrepresented students the financial support and quality educational experiences that support college persistence. Project participants have clearly stated the positive impact of their experiences and communicated their favorable opinion of the project in supporting their higher education and career goals. Given the success of this project, planning has already begun to seek additional funding in the form of a project extension with the USDA-HSI Educational Grant Program.

Costs

This project was funded by a grant from the United States Department of Agriculture's Hispanic Serving Institutions Educational Grants Program. The grant provided a total budget of $249,980.

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Principles of Project Design and Fabrication Taught as an Intensive Weekend Course

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Principles of Project Design and Fabrication Taught as an Intensive Weekend Course

Introduction/Need for Innovation or Idea

Metal fabrication projects provide excellent opportunities for teachers and students to take advantage of the three major aspects of school-based agricultural education (SBAE). Student-built projects designed and constructed as part the agricultural mechanics classroom and laboratory experience provided unique opportunity for students to apply knowledge and skills. The educational value of supervised agricultural experiences (SAE) has been well documented in agricultural education literature (Roberts & Harlin, 2007). Agricultural mechanics entrepreneurial SAEs require students to maintain a record of earning and expenditures for the business model of their choosing. Several states across the country use agricultural mechanics project shows allowing students to display their work and compete for awards and scholarships. These project also provide opportunities for students to establish a rapport with community members, local producers, and businesses by allowing them to construct high quality, unique projects while earning revenue for themselves and the program (Phipps, 1972).

According to Blackburn, Robinson, and Fields (2015), the national average of mechanized agricultural coursework in pre-service SBAE teacher certification degree programs is 4-6 hours. This amount of coursework is small given the high number of SBAE programs offering the Ag-Power and Technology career pathway (Rasty, Anderson, & Paulsen, 2017). With such limitations, teacher educators must use innovative approaches to prepare their students to effectively teach about and supervise agricultural mechanics projects. To better prepare teacher aspirants to deliver mechanized agriculture curriculum, the agricultural education program at Oklahoma State University developed a one-credit-hour, weekend course. The Design and Fabrication course provided an intensive learning experience designed to highlight the knowledge and skills needed to implement a project–based approach to instruction in the context of mechanized agriculture.

How it Works/Methodology/Program Phases/Steps

The Design and Fabrication course focused on concepts and skills needed to instruct pre-service teachers a method of teaching through student-built, mechanized agricultural projects. The course included aspects of design and planning, (including scale drawings, bill of materials, etc.) as well as leading and supervising the construction of an actual project. The one-credit-hour course promoted the use of Agricultural Mechanics Entrepreneur SAEs by emphasizing record keeping through the use of project-based learning.

The course, composed of 15 contact hours taught on a Friday evening and the following Saturday, was delivered in four primary segments of instruction. The first segment consisted of laboratory management, including laboratory safety, budgeting basics, and equipment selection. The second segment of instruction covered basics of project planning and drafting. The instructor demonstrated these skills and participants were given the opportunity to practice methods of scaled drawing and basic computer-aided design techniques. The development of this skillset is essential in the planning process of student project-based learning. The third segment highlighted the planning phase of the project. Once students were introduced and replicated the design of the

project to be constructed, they were shown how to access resources needed to plan details of the project including an itemized bill of materials. The final segment of instruction was used to construct the project. For this particular class, the project was a single-axle utility trailer. The instructional focus during this segment was not to improve students' skills, but to demonstrate and experience the project construction teaching method. At the conclusion of the course, each student developed a project record book that included a description of the project, accurate set of blueprints, an itemized budget, a bill of materials, safety and tool information, and photos of the construction process.

Results to Date/Implications

Eighteen students took the course during the spring 2017 semester. Feedback from students was positive and provided ideas for improvements to be made when course is offered in the future. The design of the course went beyond teaching students basic concepts of agricultural mechanics course work. Rather, it developed pre-service teachers' appreciation for well-rounded agricultural mechanics programs by providing an experience with the project construction teaching method.

Future Plans/Advice to Others

A goal of the agricultural education program Oklahoma State University is to continue to expand skillsets and abilities of pre-service SBAE teachers by providing them well-rounded and diversified education in technical agriculture and teaching methods. The program will continue to offer this and similar weekend courses on annual basis. Faculty recognize intensive, one-credit-hour, weekend courses can be used to introduce technical agriculture content, present innovative teaching methods, address new problems, issues and opportunities, and to provide other unique experiences not be included in the degree program. In doing so, teacher education faculty should partner with faculty from other disciplines and connect with experts in various fields of agriculture. Making extra efforts to promote courses offered in this way is important, especially if they are not listed in the course catalog.

Costs/Resources Needed

Specialized facilities were needed to teach the Project Design and Construction course. For a variety of reasons, the course was taught at a local high school rather than on campus. The high school facility had a classroom, meeting the needs for content instruction and application activities associated with design and planning. The laboratory had equipment and supplies needed to construct the project. The following equipment and tools were used: Miller 251 gas metal arc welder, oxy/fuel cutting and welding assembly, 14" abrasive chop saw, various right angle grinders, a cordless drill, and a standard socket/ratchet set. Blueprints and materials lists were based on those found in the *Red Wing Steel Works 6x10 Utility Trailer* instruction booklet. Costs associated for the course vary based on the project chosen. For the 6' by 10' utility trailer constructed in the spring 2017 course, total costs for materials was $1064.66. To compensate for costs associated with consumable materials and equipment wear, the Oklahoma State University agricultural education program paid the host SBAE program an additional $200.

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Innovative Idea

Scanning the Crowd: Using Plickers to Conduct Formative Assessments of Student Learning

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Scanning the Crowd: Using Plickers to Conduct Formative Assessments of Student Learning

Introduction/Need for Innovation

Formative assessments are useful to teachers as a method to gauge student learning, plan for future instruction, and receive feedback from groups (Arends, 2015). The use of classroom response systems (CRS) can assist in gathering instant feedback to a variety of questions (Deal, 2007) and therefore serve as a tool for formative assessment. Plickers (Plickers.com, n.d.) is one such type of CRS for classroom application that does not require students to use a device, but rather hold up a piece of paper.

How it works

Instructors must first sign up for a free account on Plickers.com and download the free app onto a smartphone or tablet. On the website, instructors create classes with rosters of students. These students are assigned a specific Plicker number that corresponds to the physical Plicker card. The students use these cards in class to provide responses to questions.

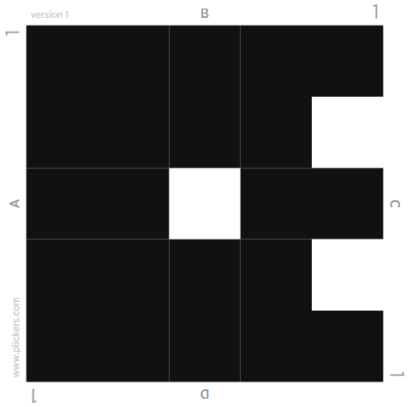

Figure 1. Example of a Plicker card.

Within each class on the website, instructors create a library of questions. These questions are limited to no more than four response options so typical questions are multiple choice and true/false. After the questions are created, instructors add them to a queue. These questions are then available through the app for the class session(s). Questions can be created and added to the queue directly through the app if necessary.

On the day instructors plan to use Plickers in class, they login to their instructor account on the classroom computer and select "Live View". This will display the question and response options for students once that question has been selected in the app. Students provide their response by holding their card in the appropriate orientation so their selected response option is pointed up. The instructor then uses the app on a smartphone or tablet to scan the cards. As each student's card is scanned a checkmark appears on the computer screen next to it. Once all the cards have been scanned, the instructor closes the scan and the answers are recorded. The instructor can then select "Graph" in the "Live View" so students can see the overall results with no names attached. The instructor can reference the questions later via the website to see how specific students answered each question.

Results to Date/Implications

Plickers were used in a course at Texas Tech University in Spring 2017 as a way to gather feedback and stimulate discussion. During the semester, the cards were integrated in five specific class sessions and multiple questions were asked during each. At the end of the semester, students were asked to provide anonymous responses as to whether they enjoyed using the Plickers in class and if they should be used in the future. The responses were overwhelmingly positive as demonstrated in the following quotes:

- “Loved the plickers! They were a fun thing to do throughout the class.”
- “I really liked the Plickers! I think it was very useful to allow the students to feel like we can provide input without taking too much time for everyone.”
- “I loved them and I liked looking at the end of results when we were done throughout the class.”
- “I wish we used them more.”
- “I think the plickers were really cool! I liked using them and thought they were a good instrument to add to class.”
- “They were easy to use and fun to get instant polls. Use more!”

Beyond this class, teacher educators have also demonstrated how Plickers could be effectively integrated in the high school classroom. Pre-service high school teachers were taught how to use Plickers and have used them in several situations where technology integration is difficult such as a meat locker, a metals lab, a livestock feedlot, and a classroom where cell phones are not permitted.

Future Plans/Advice to Others

As the students suggested, Plickers will be used more often in the post-secondary level course and will be integrated in additional courses. Plickers can be taught to pre-service teachers in 15 minutes, including a demonstration and activity. This active engagement strategy does have some limitations. The response options are limited to no more than four pre-determined answers. This does constrain the types of questions that can be asked. Another feature of Plickers is the ability for instructors to set one answer as the “correct” option; however, this is not required if the responses will not be graded. This was the approach taken in the class at [university] to encourage discussions about the responses and not declare one as the best option.

The Plickers are available in sets of 40 or 63 so class size needs to be a consideration. For classes that have more than 63 students, the Plickers could be shared in pairs or groups. Students can also keep the card in their notebook rather than picking one up at the start of each class period. Depending on the size of the room, some rescans of the cards might be necessary to ensure all students have replied. Also, the time needed to scan the cards should be considered when integrating them into the class period. Finally, because holding up the cards with the correct response can be cumbersome, students can write the response options (A, B, C, D) on the back of the cards to assist them when they hold up the card to provide their answer.

Costs/Resources Needed

The use of this innovative idea can be free. No charge is associated with starting an account on Plickers.com or downloading the app (available for both Apple and Android devices). Multiple options of Plickers card sets can be downloaded for free from the Plickers.com website. A more durable, laminated set can be purchased from Amazon for $20. The other required technology is a smartphone or tablet with camera and Internet access. The room in which the class is taught also needs an instructor computer with Internet access in order to display the questions and results.

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Solving the Interactive Video Puzzle: EdPuzzle as a Platform for Content Delivery

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Solving the Interactive Video Puzzle: EdPuzzle as a Platform for Content Delivery

Introduction/Need for Innovation

Students increasingly desire visual content to help them learn (Carr, 2014). Although students prefer to learn through videos rather than still images (Baker, 2016), researchers have found that video content only increased student knowledge when used in an interactive format (Zhang, Zhou, Briggs, & Nunamaker, 2006). Creating meaningful video content can take time and technological expertise, which is one of the biggest barriers to teachers utilizing this method of teaching for secondary and post-secondary instruction (Baker, 2016).

Agricultural educators desire a useful platform for delivering video content (Rutherford, 2014), and have a large workload which prohibits them from having additional time to create course materials (Torres, Ulmer, & Aschenbrener, 2008). The EdPuzzle tool (www.edpuzzle.com) is an online service that allows teachers to easily embed interactive components to pre-existing video content.

How it Works

The EdPuzzle tool allows instructors to create an interactive video module by uploading video content from an existing file or from any publically available YouTube video. The tool allows teachers to place multiple choice or short answer questions at any point during the video, or add additional audio or text comments. At the determined time for each interactive component, the video pauses and the student must attend to the question or comment before continuing to view the video. EdPuzzle can also be set to prevent students from skipping or fast forwarding the video. In addition, the tool allows the teacher to set the days and times the video module is available to students, a due date for completion, and records which students have started and completed the module.

Teachers deliver the video content to students by adding student email addresses to classes within the EdPuzzle system, and email a link to the students with a username and password which allows them to access secure class content. Student information is collected in the teacher EdPuzzle portal, including scores and choice selections on each multiple choice quiz questions, student answers to short answer questions, embedded in the video and class summary scores for each module.

The EdPuzzle platform also allows teachers to search from previously created video modules. There are currently more than 200 agricultural education related video modules created on EdPuzzle. As agricultural educators begin to use EdPuzzle more often, more agricultural education videos will be available to teachers with little input required.

Results to Date/Implications

EdPuzzle was used as a platform for delivering content in both the on-campus and high-school sections of the pilot for a dual-credit agricultural education course in Spring 2017.

Students enrolled in the on-campus (n = 6) and high-school (n = 19) sections had the opportunity to complete two of the eight course modules in the EdPuzzle system. The course instructor created video content using PowerPoint and uploaded the video into the EdPuzzle system. The first module included seven interactive pieces, and the second module included ten interactive moments. Results on the video module quiz questions were scored by the EdPuzzle platform and checked for accuracy. All student quizzes scored through the system were accurately recorded.

The instructor noted the ease of use and time-savings allowed by using the platform. Students reported their assessment of the platform on the course assessment. A high-school student enrolled in the class for dual-credit said, "having the quizzes in the video really helped me to pay attention, I kind of zone out on most videos I watch for classes." One of the on-campus students noted:

> I wish I had more online classes using something like the interactive videos, I liked that it was allowing me to think, and then having me put in my answers to the questions made me accountable. I also liked that the modules were open and let me do them when I had time.

Overall, the use of EdPuzzle has been determined to be a successful online video platform for the class that was easy to implement and engaging for students.

Future Plans/Advice to Others

We plan to modify the course design this fall to use EdPuzzle as the exclusive delivery platform for delivery of online asynchronous content. The course videos have been created using Camtasia and Powerpoint, then uploaded into the EdPuzzle system. In addition, we have identified five additional videos from other sources we will be adding interactive components to through EdPuzzle and using them in the course instruction.

Some important considerations for others include the limitations of using EdPuzzle. Currently, the only type of self-scored question allowed by EdPuzzle is multiple choice. Care should be taken to ensure that other forms of assessment are being used to encourage higher-order thinking for content. Another consideration is important for teachers who have a block on using YouTube in their school. By embedding a YouTube video in an EdPuzzle presentation, students are able to access it even if the school firewall would normally block YouTube content. Teachers should take care to ensure their administration knows which videos are being used, and their tie to the objectives of their courses.

Costs/Resources Needed

EdPuzzle is completely free of charge to students and teachers for all video module features. The company provides an online gradebook program and a student tracking program separate from the video module features that they offer to districts on a contract basis. In order to access the content, students need access to a computer, tablet, or smartphone with internet access. Teachers require minimal training to be able to use the system, complete training videos are available on the EdPuzzle website.

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The Storytelling Exercise: An Innovative Approach to Teaching Interview Techniques

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The Storytelling Exercise: An Innovative Approach to Teaching Interview Techniques

"The Storytelling Exercise" began as a way to introduce interviewing techniques to agricultural communications students, but grew into a lesson on audience analysis, context and accuracy. The exercise itself is low-key and old-school. Students interview a relative and condense the information into a roughly 600-word essay. Essentially, they are to tell a story, albeit a well-sourced one. The exercise is a simple, yet valuable, lesson aimed at working out students' interviewing jitters and mistakes with their relatives before they are assigned to interview with subjects they do not know as well.

However, the assignment took on new life with the addition of a second component. In addition to interviewing and writing, students must have their interview subject read the essay and provide written feedback to the instructor regarding the accuracy and context of quotes, overall preparation, and writing. Students' interview subjects generally provide authentic, constructive, and useful assessments of the work, often commending the assignment itself.

This written feedback portion has provided invaluable information to the instructor, allowing her to gauge how students conduct interviews, including preparation and incorporation of classroom techniques. For example, the assignment allows the instructor to assess whether students use "conversation starters" rather than questions, recognize quote-worthy statements, and take good notes. This assignment could be adapted for students of any major expected to perform in interview-type settings, including parent conferences, professional meetings, and presentations.

How it works

Students are assigned to interview their eldest relative (students define "relative") for a general profile-type article. Students are to use techniques learned in class to prepare the interview and develop questions. The interview must be completed in person or via phone. Students are to take notes and compile the information into a two-page article, which they must have the relative read and provide critical evaluation. This feedback is delivered to the instructor in various ways: handwritten notes, emails, or transcription from a phone conversation. Students submit the article and feedback paragraph for a grade.

Students generally interview grandparents for this assignment and often end up retelling family stories they have heard for years. However, the assignment forces students to condense the information into a short story without straying off topic by trying to explain backstories and inside jokes. Students must tell the story without assuming the audience knows anything, which is often a tough concept for novice writers. Additionally, the assignment works as students' first "real" interview experience. They prepare questions, take notes, and navigate the pitfalls of interviewing while learning about accuracy and context.

Goals. Students receive a practice-run at interviewing. The plethora of information, combined with family backstories (students' "institutional knowledge"), forces students to consider the audience's perspective while condensing the material to two pages. The feedback portion of the assignment allows students to consider the context of their writing and fact check.

Results

IRB approval was granted to review students' storytelling assignments for this project. Students were asked to voluntarily provide their completed work for this research. The instructor noticed the following themes regarding the assignment.

Emotion. During a debriefing classroom discussion, many students reported navigating unexpected issues of sensitivity. For example, students often share that their interview subject

became tearful while recalling life events, which provides the instructor the opportunity to discuss professional decorum. Additionally, students commonly reflect on how to keep the interview on-topic without seeming impatient or brash. Students also often relate that their interview subjects required some level of accommodation; for example, asking to repeat questions or speak up.

Confidence. A first interview experience in a low-stakes environment allows students to work out mistakes without embarrassment. Students know the interview subject will provide a critique to the instructor, adding a level of rigor. The feedback portion of the exercise allows students to consider the interview from the subject's perspective, allowing students to adjust their technique before a higher-stakes interview.

Feedback. To be sure, some interview subjects critique lightly, if at all. However, the written feedback generally takes a constructive tone, with subjects gladly providing an assessment. Often, the feedback is written directly to the instructor. Formal letters and paragraphs written in a language other than English, but translated by the student, have all sufficed for feedback.

Examples of critique responses

The following statements are taken from critiques provided by interview subjects, allowing the instructor to assess students' abilities:

Approach to interviewing

- "The interview was really good. I didn't feel questioned, it was more of a friendly chat."
- "She was a great interviewer and got stuff (out) of me that I didn't even realize."
- "(Student) was prepared with her questions, worked with a timeline and was attentive to my responses to her questions."

Extra practice is needed

- "The article was accurate and her quotes were used to correctly reflect what I was saying. She has the habit of using the same phrases over again, so she needs to be careful of that."
- "I would have liked more specific questions. That would've been better for me, specifically."
- "His questioning ability was good, he is better at questioning strangers, believe it or not."
- A critique provided in another language via phone, transcribed and translated by a student: "She said I 'asked great questions, but needed to focus on asking one question at a time.'"

Context matters

- "My Nana liked that the article had details, but she felt that (a) specific detail made her appear mean."

Future plans and advice

As this project develops, the researcher plans to ask students to submit a list of questions in advance. Because students interview relatives, they may take preparation for granted. Requiring students to submit a list of structured questions would allow the researcher a better idea of how well students understand interviewing techniques (for example, open-ended questions) and ensure preparedness.

Resources and costs

Students need a computer equipped with Microsoft Word and a phone or communication software. In general, there are no costs associated with this project. However, phone charges could be incurred, and some students travel to meet interview subjects or use recording devices. However, online communication programs (Skype) may be used, and travel and recording are not required.

Tiered Assignments in an Online Learning Environment

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Tiered Assignments in an Online Learning Environment

Need for Idea

Each student comes to class with certain learning experiences, expectations, and needs to be addressed (Mupinga, Nora, & Yaw, 2012). Instructors should to be sensitive to those needs in order to maximize students' learning experiences. For the online instructor, facilitating engagement and learning styles can be challenging. Mupinga et al. suggest online learning is primarily evaluated through written communication. However, online instruction may provide an opportunity for instructors to reexamine the way in which coursework has been typically structured (Conner, Stripling, Blythe, Roberts, & Stedman, 2014), and include varied methods of engagement and learning. It is important to structure the course objectives and assignments in order for students to interact with the content to maximize learning.

Tiered assignments (Tomlinson, 1999), a method of differentiated instruction, allow instructors to teach the same objective to all students and for that objective to be achieved through various levels of difficulty and/or modalities. Instructors identify the concepts and objectives all students should know, determine a standard for what all students should be able to do following a lesson, and identify deeper applications or extensions that create advanced assignments (Tomlinson). Assignments are created by the teacher to appeal to the multiple intelligences of the students that can range from simple to complex (Danzi, Reul, & Smith, 2008). Students then choose the level of challenge that will help them maximize their learning. There are multiple approaches to tiered assignments. For this course, assignments were tiered for product, rather than challenge level, complexity, resources, outcome, or process (Heacox, 2002; Tomlinson, 1999). Based on student learning preference and objectives for the assignment, students worked at varied degrees of difficulty, explored the same essential objectives and processed the objectives through different types of product.

How it Works

Thirty-three students enrolled in a 16-week online graduate course were from a variety of backgrounds, experiences and employment. They included current teachers in agriculture, family and consumer sciences, technology and engineering, and business, extension, community college instructors, and industry professionals.

Students were given a pre-assessment during the initial introductions in class. These were individual, short, written responses to questions about experience, year's teaching/training, expected outcomes for class and learning modalities. Two assignments were identified to be part of the tiered product approach due during week three week eight. The standard for all students to meet was achieved through a discussion board post. Both of the assignments allowed for all students to further explore the main objective of the assignment, yet create a product unique to their learning style. Students were given the option to select the most appropriate product for their learning style. The options included; tier one - written paper (verbal-linquistic), tier two -

text with graphic (visual-spatial), and tier three: audio/visual or text/photo/audio (visual-spatial/interpersonal).

Results to date/Implications

Many students continued to use a text only or written form of the assignment (75% Assignment 1; 63% Assignment 4). When given the opportunity for choice, one-third of the students in this online class chose to developed assignments that tapped into the multiple modalities of the tiered approach (Danzi et al., 2008). Further, the end of the eighth week of class, four additional students completed an assignment utilizing a different modality (see Table 1). Assignments submitted included written papers, PowerPoint, Prezi, and Adobe Spark videos with text, photo, and audio; videos of students and their classrooms, and infographics. The products were evaluated for meeting the main objective of the assignment, connection to experiences, and completeness.

Table 1
Products of Tiered Assignments

Week	Written Paper	Text/Photo/Audio	Audio/Video	Text/Graphic
Week three:	25	4	4	
Week eight:	21	2	8	2

Future Plans / Advice to Others

Future plans include integrating additional tiered assignment approaches. Implementation of the product tiered assignment format (Tomlinson, 1999) into the select assignments will continue. However, providing an opportunity to share, peer review, or collaborate on tiered assignments will be applied. To assist in clarity of requirements, continue to provide one rubric for each tiered assignment that meets the educational objective. However, provide guidelines for the tiered aspect of each product including specific requirements for the written paper, PowerPoint/Prezi/Adobe Spark with audio, video, and infographic. This will provide additional structure to assignments and opportunities for students to interact with the content, each other, and the instructor to augment learning. Instructors should use technology to transform courses into more personal and engaging learning experiences by using digital materials to increase access and create opportunities for collaborative and project-based learning (USDE Office of Educational Technology, 2017). Further, exploring opportunities for enrichment in online learning communities is essential, integrating differential instruction and assignments may one way to accomplish this.

Resources Needed

The recourses needed to implement the tiered assignment are an online learning environment, instructor time and flexibility.

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Using Basecamp in an Agricultural Communications Block Course Structure

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Using Basecamp in an Agricultural Communications Block Course Structure

Introduction/Need for idea or research

Agricultural communications industry professionals desire more developed "indirect" competencies in agricultural communications graduates, including a more holistic approach to communications, tactical and strategic skills, and project management ability (Irlbeck & Akers, 2009; Morgan, 2010). In order to help students learn these soft skills in the classroom, an innovative approach to instruction in agricultural communications curriculum is needed (Doerfert & Miller, 2006). The Texas Tech University agricultural communications (ACOM) undergraduate program began using a "block" classroom structure for its four senior-level courses during the spring 2017 semester. The new structure, modeled after the agricultural education block system, included ACOM courses in publication development, campaigns, advanced web design, and media convergence. The purpose of this new structure was to provide students with a structured learning environment that mimicked a cooperative communications environment. To assist with the ACOM Block's goal of boosting students' understanding of strategic organizational communications, the students and instructors used an online program called Basecamp.

How It Works

Basecamp is a web-based project management system designed to help streamline internal and external communications. Specifically, it "helps organize projects, internal communications, and client work in one place so you have a central source of truth" (Basecamp, 2017, para. 1). The program uses six core communication tools: a schedule, message boards, docs and files, to-dos, automatic check-ins, and the "campfire," a casual chatroom for project contributors. With these tools, Basecamp attempts to replace several common communication tools within organizations such as emails, conference calls, and face-to-face meetings. Each tool encourages collaboration, open communication, and accountability on project progress. An additional tool, pings, enable quick, one-on-one messaging within Basecamp.

The ACOM Block used Basecamp to assist with the unique organizational and communication challenges created by the combined four-course structure. All 22 students enrolled in the Block and each of the four Block course instructors created user accounts and were added to the "ACOM Block Headquarters" within Basecamp. The Basecamp schedule feature was used to chronologically list all deadlines for assignments, quizzes, and projects for the four Block courses. The docs and files feature was used to house all course syllabi, resources, and shared documents from each course in one centralized location. Students and instructors were able to add materials to these folders. The casual, open communication of the campfire feature was used to make announcements or pose questions.

To determine perceptions of using Basecamp, a five-question Qualtrics survey using open-ended and Likert-style questions was sent to all 22 Block students at the end of the semester. Fifteen students responded to the survey.

Results to Date/Implications

Overall, students reported a positive experience when using Basecamp in the ACOM Block. Of the 15 respondents, 60% said Basecamp kept them more organized, 86.7% said they used Basecamp to communicate with fellow students, 80% used the program to communicate with instructors, 93% said it was a helpful place to find course documents and materials, and 73% said Basecamp was more helpful than Blackboard.

Of all of Basecamp's tools and features, students favored the ability to easily access all course resources in one location, especially the Docs & Files option. Others noted the ability to communicate with fellow classmates in a closed social media-style environment was helpful for asking questions about assignments and projects. A few students reported there was a learning curve with Basecamp at the beginning, but did understand its benefit to group communication. As a drawback, students expressed their displeasure with the overlapping functions of Basecamp and Blackboard, specifically stating they wished they could submit assignments via Basecamp. Three students stated the Block should only use one of the two programs.

Some students noted annoyance with the multitude of notifications they received from Basecamp. Within Basecamp's six core tools, students said the comprehensive schedule was the most useful. One student noted, "It was nice to see everything that is going on in all of the courses in one place."

Future Plans/Advice to Others

Basecamp provided a central, organized hub for communication, file access, and scheduling during the ACOM Block and facilitated the students' experience with strategic communication. The capabilities inherent in Basecamp fostered student collaboration on group projects.

The ACOM Block will continue to use Basecamp as a means for organizing course content and teaching the soft skill of project collaboration. Efforts should be made to better streamline the use of Basecamp and Blackboard and clarify why each is being used in the course. For example, Basecamp provides more tools for collaboration and teamwork while Blackboard allows for confidential assignment submission and grade tracking. Students should be given clear expectations for when Basecamp, Blackboard, and email are used within the ACOM Block. Based on student feedback, course instructors should strive for consistency between schedule dates and deadlines between Basecamp and Blackboard to avoid student confusion. Because students are more accustomed to using email for regular communication, Basecamp's message forwarding function should be used to avoid missing important announcements. Additionally, if instructors are going to encourage the use of Basecamp in the course, they need to be just as engaged in the program as the students, including responding to pings, message board questions, and campfire discussions.

Costs/Resources Needed

Basecamp is free when used for verified educational purposes. Getting free educational access to the program only requires an email be sent to Basecamp from a university account. Once an instructor has set up an account, they can invite students to join the project. Basecamp can be accessed via web browser and the free Basecamp smartphone app, which provides push notifications to project contributors.

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Using Pre-College Experiences to Increase College Access and Readiness for Underrepresented Students

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Using Pre-College Experiences to Increase College Access and Readiness for Underrepresented Students

Introduction

It is a commonly held feeling among educators that there is a lack of alignment in curriculum, standards and assessments between high school and higher education (Bailey, Hughes & Karp, 2002). This has negative impacts on students, especially upperclassmen, as they transition to college and careers. Nearly 60% of first-year college students discover, while fully eligible to attend college, they are not academically prepared for higher education (National Center for Public Policy and Higher Education, 2009). Specifically, in New Mexico 32% of high school students were found to possess college ready skills in math and science (Winograd & Sallee, 2011). The problem is exacerbated with minorities and students from low socioeconomic backgrounds (Balfanz & Legters, 2004). However, engaging students in experiences prior to college enrollment, which engage students in a university-like setting, can mitigate the college-readiness challenges (Porter, 2003).

Engaging underrepresented students in pre-college experiences, like dual enrollment, provide high school students the opportunity to complete postsecondary courses on their high school campus, university campus, or online. Dual enrollment programs offer students the chance to earn college credit in high school, provide financial savings, allow them to expand their course offerings in agriculture, and offer them early access to college. Students' participation in dual enrollment courses plays a significant role in degree persistence, especially for those students who continued their enrollment in postsecondary education without a break of more than one semester (Swanson, 2008). The quality and breadth of the high school course of study produces the greatest influence upon students' future college persistence and degree attainment (Adelman, 1999). Participation in dual enrollment can shorten the time required to graduate with a degree in agriculture, reducing overall costs to families and students of postsecondary education (Porter, 2003).

How it Works

This project, sponsored by a United States Department of Agriculture Higher Education Challenge Grant (USDA-HEC) Program sought to increase college access and readiness of underrepresented students. This project was a collaborative effort between the Agricultural Science program and the Office of Distance Education at Eastern New Mexico University. High school students in New Mexico are able to complete seven agriculture courses at Eastern New Mexico University. Courses are offered in two modalities: 1) taught by the high school agriculture teacher, serving as a university adjunct or 2) in a hybrid model where students complete their assessments online while their agriculture teacher facilitates course content and laboratory activities in the high school setting.

Through the three-year project, the following steps were taken to accomplish the three objectives set forth the project staff:

Objective 1: Develop new online dual enrollment offerings and refine current offerings to

increase course quality. To accomplish this objective, the project staff, in conjunction with agriculture faculty and distance education experts, developed a new horticulture-based, hybrid dual enrollment course. In addition, all existing hybrid-model courses were evaluated using the Quality Matters® (QM) online course evaluation program.

Objective 2: Prepare secondary agriculture teachers to effectively deliver hybrid model dual enrollment courses. To meet this objective, project staff provided individualized and group-based professional development programming to secondary agriculture teaches in New Mexico. Professional training focused on curriculum content, technology implementation, and experiential teaching methods.

Objective 3: Increase the enrollment in the Eastern New Mexico University agriculture dual enrollment program. With the assistance of undergraduate researchers, the project staff made on-site visits to secondary agriculture programs throughout New Mexico along with presentations at state-wide events including the State FFA Convention and New Mexico agriculture teachers conference. Descriptions of the program and potential benefits were presented to teachers and students to serve as recruiting information to build enrollment.

Results to Date

The project was successfully implemented and all three objectives were met. One new course was offered and all existing courses were subjected to QM review and revisions were made. Additionally, QM concepts were applied to the non-online courses and content and delivery improvements were made as well. Over 50 on-site visits to schools throughout the state were made along with presentations at the State FFA Convention in addition to the New Mexico agriculture teachers conference and district FFA events. Student enrollment in the dual enrollment program increased by over 40%, with 25% of the growth attributed to minority students and, over the three-year life of the project, school participation in the program increased by 100% to include 52 of the 87 secondary agriculture programs in New Mexico.

Conclusions/Future Plans

This project has provided Eastern New Mexico University with the tools necessary to build the infrastructure to engage underrepresented students in pre-college experiences that support college access and readiness. Project participants have clearly stated the positive impact of their experiences and communicated their favorable opinion of the project in supporting their education and career goals. Given the success of this project, planning has already begun to seek additional funding in the form of a project extension with the USDA-HEC Grant Program.

Costs

This project was funded by a grant from the United States Department of Agriculture's Higher Education Challenge Grant Program. The grant provided a total budget of $149,137.

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Research Poster Abstracts

A Case Study of the Texas Alliance for Water Conservation's Communication Efforts

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A Case Study of the Texas Alliance for Water Conservation's Communication Efforts

Introduction/Need for Research

An estimated $20 billion worth of the world's food and fiber is produced in the eight states that span from Texas to South Dakota, also known as the High Plains region in the United States (Little, 2009). Below these states lies 174,000 square miles of groundwater known as the Ogallala aquifer. The necessary and intense use of this water supply combined with the slow recharge rate (Marsh, Peterson, & Williams, 2003) has created the need to place an emphasis on conserving the water available in the Ogallala aquifer.

One effort to address the need to research and communicate water conservation practices is the Texas Alliance for Water Conservation, established in 2006. The purpose of this non-profit organization is to educate West Texas farmers and ranchers about effective and efficient water management techniques to more efficiently conserve water from the Ogallala aquifer. TAWC producers and analysts keep records of crop yields, water usage, and other aspects of crop production. This information is analyzed to determine what the most efficient (both environmentally and economically) farming practices are. Then these TAWC producers communicate with fellow farmers about this information, with the goal to establish a behavioral change in how West Texas farmers and ranchers conserve their water (TAWC, 2016). The purpose of this study was to explore how agricultural producers use TAWC's communication efforts for water management decisions.

Conceptual and Theoretical Framework

The conceptual framework for this study was based on social marketing, which refers to the "efforts focused on influencing behaviors that will improve health, prevent injuries, protect the environment, contribute to communities, and, more recently, enhance financial well-being," (Lee & Kotler, 2016, p. 8). When the goal of an organization is to foster a sustainable behavior, it is vital to emphasize personal contact because it is through personal contact that a person's attitudes and behaviors are influenced (McKenzie-Mohr, 2011).

The theoretical framework for this study was Rogers' (2003) diffusion of innovation theory. The process of diffusion refers to "an innovation communicated through certain channels over time among the members of a social system," (p. 5). For individuals to adopt something new, they must go through the Innovation-Decision Process (Rogers, 2003). The diffusion of innovations theory was an appropriate framework for this study because the implementation of water conservation practices into agricultural operations requires individuals to move through the innovation-adoption process.

Methodology

This study used a case study research design. The lead researcher conducted semi-structured interviews, group observations, and analyzed TAWC documents (project summaries, final reports, and annual research reports) to answer the research questions. Using criterion, stratified purposeful, and snowball sampling, the lead researcher selected individuals who represented three distinct groups to interview to gain different perspectives regarding TAWC's communication efforts. The participants of this study are divided into the categories of TAWC

Staff (*n* = 5), TAWC Producers (*n* = 3), and West Texas Farmers and Ranchers (*n* = 3).

Using a questioning guide, the lead researcher conducted 30-minute semi-structured interviews with these participants. Participants were asked about their awareness and opinion of TAWC and its communication efforts. At the conclusion of the transcription process, the data from the interviews were organized, read and noted, and classified into codes and themes (Creswell, 2013). To address the study's trustworthiness, the researchers followed Guba and Lincoln's (1985) recommendations to establish credibility, transferability, confirmability, and dependability.

Results/Findings

Interview participants indicated having a personal contact within TAWC is key to awareness. One participant credited a large majority of his awareness and interest in the TAWC project to his relationship with key TAWC informants. These statements suggest there is an opinion leader influence from TAWC staff members. Some of the emergent themes from the interview process was that all participants want to conserve their water, know the importance of water conservation, and have already implemented water conservation techniques to some degree. Participants agreed that any program focused on conserving water while keeping farming profitable is a good thing and they would be open to whatever water conservation techniques the conservation organizations recommend.

Participants stated that they use various communication methods for different purposes; therefore, it is important for TAWC to use a variety of communication methods to deliver its information and reach stakeholders. The various methods of communications used included online media, interpersonal communications, and traditional media. Online media use was key to being aware of the TAWC and recent research, but interpersonal communication was necessary to learn about the TAWC project. To stay informed, one participant, Mr. E, credited the necessity of using a variety of these communication methods to the constant progression of technology and communication channels. Another participant, Mr. A said he believed that the different audience characteristics within TAWC's targeted group is the reason a variety of communication methods must be used.

Conclusions

For agricultural producers to become aware of TAWC and interested in the organization's activities it was helpful to know someone else in the project. McKenzie-Mohr (2011) noted it is important to emphasis personal contacts when encouraging sustainable behaviors, and Rogers (2003) acknowledged the role of change agents in the diffusion of innovations. Communications use by the TAWC are varied in methods in order to serve a diverse audience and meet the different preferences of its stakeholders.

Implications/Recommendations

TAWC should continue using a variety of communication channels to reach agricultural producers, but rely on interpersonal communications as its primary communication method. The TAWC could also host workshops or webinars for producer members of the project to help them become more effective communicators. Future research could determine how the TAWC project changes in terms of its communication efforts to meet its stated goals, as well as

determining the communication preferences and habits of its audience members.

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A Comparison of Hours Among Pre-Service Teachers in the Roles of FFA Advisor and Classroom Teacher

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A Comparison of Hours Among Pre-Service Teachers in the Roles of FFA Advisor and Classroom Teacher

Introduction

The profession of teaching is a challenging one increasingly driven by standards based teaching and high stakes testing in which professionals are evaluated by complex rubrics. Freese (2006) described the process of learning to teach as challenging and complex. The process of student teaching is noted as a key experience in the training of new agricultural educators (Myers & Dyer, 2004; Kitchel & Torres, 2007). Smith and Rayfield (2017) describe the student teaching experience as an opportunity for a high impact, real-world experience that creates change in student teachers.

Conceptual Theoretical Framework

This study was rooted in the connection between self-efficacy and positive experiences in a task (Bandura, 1986). Pfitsner-Eden (2016) noted that increases in teacher self-efficacy were associated with a diminished intention to quit the profession. This aligned with studies that noted teachers with lower feelings of self-efficacy also reported diminished job satisfaction and a reduction in the number of years planned teachers planned to stay in the profession (Blackburn & Robinson, 2008; McKim & Velez, 2015). Within the specific field of leadership in agricultural education, McKim and Velez (2017) noted that there was a relationship between amount of time a student-teacher spent on leadership activities and their perceived self-efficacy in leadership. Krysher, Robinson and Edwards (2015) reported an increase in self-efficacy of teaching skills with an increase of hours spent teaching as a preservice student. It was from this perspective that researchers at Texas Tech University began an evaluation of its teacher preparation program. Rossi, Lipsey, and Freeman (2004) stated that for a program evaluation to be worthy it must judge the quality of performance in terms of effectiveness. This process began by investigating the allocation of hours spent by student teachers within the areas of serving as a secondary agricultural instructor and an FFA advisor during a student teaching placement semester.

Methodology

The spring cohort of student teachers at Texas Tech University ($N = 15$) used a MS Word template based on the instrument used by Torres and Ulmer (2007) to provide weekly reports on time allocation and reflection. Students self-reported hours spent: 1) Observing Cooperating Teacher, 2) Preparation for Instruction, 3) Classroom and Laboratory Teaching, 4) Laboratory Preparation and Maintenance, 5) Grading/Scoring of Student Work, 6) Administrative Duties/Program Management, 7) Professional Activities (meetings, in-service), 8) SAE Observations and Recording, 9) FFA Activities – Local, 10) FFA Activities – Area, District, and/or State, 11) CDE Preparation, 12) Adult Education, and 13) Conference time with Cooperating Teacher.

The data from these reports were compiled into Microsoft Excel. Individual data from the 13 categories were compiled into a cohort summary sheet and then broken out into cohort data for the more general themes of learning as a student, serving as a secondary classroom instructor, other administrative duties, FFA advisor duties, and adult education. This study focused on a comparison of times spent in the roles of classroom instructor and those spent

serving as an FFA advisor. Basic descriptive statistics were calculated using the included functions in Excel and verified using processes provided by Field (2014) and Lane (n.d.).

Findings

The total hours spent by the cohort in roles associated with serving as classroom instructor was 4067 (M = 271.1 SD = 126.2). The cohort total for hours spent as an FFA Advisor was 4226 (M = 281.7 SD = 165.6). Six students accumulated hours that were between one and two standard deviations from the mean and three students had scores that were beyond two standard deviations. One of these (Student 3) was the highest in hours (543) spent as an instructor equivalent to 2.16 standard deviations above the mean. However, this student was within one standard deviation in hours as an advisor. Students 1 and 11 however, were the two highest in hours spent as and FFA advisor and were and the lowest in hours spent as an instructor. Student one recorded 376.3 hours more than the mean as an advisor and 157.1 hours below the mean as an instructor. In the same categories, student 11 was above the mean by 355.8 hours as an advisor and 159.6 hours below the mean for serving as a classroom instructor. Six students were within one standard deviation in both categories. Two students reported scores that were below the mean in both categories and the remaining 14 students were above the mean in one category and below in the other.

Conclusions, Implications, and Recommendations

The total number of hours and corresponding means among the cohort of student teachers at Texas Tech University would indicate a balance between time spent as an instructor and as an FFA Advisor. However, the standard deviation for the two categories show that student teachers are having decidedly different experiences. There is a negative correlation between the hours spent as an advisor and time spent as a classroom instructor. Two students are more than two standard deviations higher than the mean scores as an FFA Advisor and the reported the lowest number of hours as classroom instructors. Two students were below the mean in both categories.

McKim and Velez (2017) and Krysher et al. (2015) reported an increase in self-efficacy in specific areas of agricultural education with an increase in the time spent in the respective areas. The implications for the dis-similarities of hours spent as instructor and advisors among the student teachers in this study is that the program completers may also have similarly different levels of self-efficacy in these areas. Low feelings of self-efficacy among pre-service teachers is associated with a reduced self-projection of longevity in the field (Pfitsner-Eden, 2016).

The scope of this study should be increased to include additional universities from the region and nation. This will provide more data to determine the strength of the relationship among categories of time allocation. Prior to placing student teachers with a cooperating district or teacher, a better understanding of the preferences and priorities should be established. More specific expectations and guidelines should be established for time allocation expectations. These expectations should be communicated clearly to cooperating and pre-service teachers as part of a pre-placement training. Additionally, professional development opportunities should be created for cooperating school districts and teachers that partner with Texas Tech University.

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A comparison of the safety education exposure levels of students participating in the 2003 versus the 2013 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show: Are students more safe 10 years later?

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A comparison of the safety education exposure levels of students participating in the 2003 versus the 2013 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show: Are students more safe 10 years later?

Introduction/ Conceptual Framework

In the U.S., agricultural education has historically been focused using a three-circle model with the three various components working together (National FFA Organization, 2014). These three components consist of classroom/ laboratory instruction, the FFA, and Supervised Agricultural Experience projects (SAE). School-based agricultural education programs offer many unique hands-on opportunities for students, not only in the agricultural industry, but also in academia and life (Hubert, Ullrich, Lindner, & Murphy, 2003).

Agricultural mechanics classes continue to be one of the most popular curriculum choices for agriculture students today (Hubert & Leising, 2000; Perry, Williams, & Anderson, 2012). When school administrators and teachers commence a laboratory learning experience with their students, they assume the responsibility of providing an accident free environment for the learner (Gliem & Miller, 1993). Of all the tasks and duties of an agricultural science teacher, student safety while working in an agricultural education laboratory is the most important task (Dyer & Andreasen, 1999). Mahon (1975) found that the primary responsibility for providing student safety instruction and a safe learning environment rests with the teacher. Numerous studies concerning safety in agricultural education laboratories have found that these environments can have potential safety hazards relating to noise (Miller & Schimpp, 1993), ventilation (Madou-Bangurah, 1978), and student and teacher attitudes regarding safety (Laird & Kahler, 1995; Lawver & Fraze, 1995). Additionally, students may be exposed to many different tools and materials, some of which are potentially hazardous to their health or could cause serious injury — including death (Johnson & Fletcher, 1990). These laboratories can become dangerous if students are not required to adhere to certain safety guidelines and procedures. With adequate safety education in place, laboratories are an essential venue for learning industry-related skills and gain work experience (Daclan, 2013).

In a recent study by Shultz, Anderson, Shultz, and Paulsen (2014), researchers found that Iowa agriculture teachers perceived safety in the agricultural mechanics classroom/laboratory as being of upmost importance; hence, out of 54 agricultural mechanics competencies that teachers identified as important, seven of those were safety related. In 2012, Perry, Williams, and Anderson, found that 15.4% of Texas agricultural science teachers reported that they do not require students to wear safety glasses or proper personal protection equipment (PPE) while working in the laboratory during hazardous conditions. Another safety study conducted in 1999 by Gerlovich, Whitsett, Lee, and Parsa found that 59% of teachers in Wisconsin had never received any type of safety training and only 14% of the teachers surveyed knew the purpose of Material Safety Data Sheets. As educators, our role in safe laboratory instruction is paramount as the popularity of agricultural mechanics courses increase in public schools.

Furthermore, in teacher preparation programs across the U.S., the instruction of the curriculum area of agricultural mechanics is a critical component in the preparation of new teachers for classroom/laboratory instruction. (Burris & Robinson, 2005). Based upon a review of literature, a conceptual framework based upon the need for safety education in agricultural education laboratories was found and still present to this day.

Methodology

The purpose of this non-experimental, quantitative census was to understand the extent of safety education provided to the 2013 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show participants(HLSRAMPS; $N = 632$), by their respective agriculture teachers and compare those results to data collected in 2003 by Ullrich, Pavelock, Muller, & Harrell (2005). Additionally, injury intensity and demographic characteristics of the participants were also explored. The instrument was judged to be valid (face and content) by a panel of experts ($N = 5$). Data was collected via a booklet style survey that contained two sections (demographic information and questions concerning safety education). Within the safety education section of the instrument, age specific questions were offered to the respondents. Because the instrument was merely collecting demographic information about the participants, reliability of the instrument was of minimal concern to the researchers. Surveys were individually delivered to each student at each project during the 2013 HLSRAMPS. A response rate of 100% was achieved from all participants. Data was analyzed using IBM SPSS 22.0 and frequency and percentages were reported.

Results

Analysis revealed that students had more positive levels of safety education exposure in Texas agriculture classrooms in 2013 than in 2003. The top three increases in student exposure to safety education were in the following categories: *hearing protection was required when working in the agricultural mechanics laboratory* ($\Delta n = 325$; 46.64%), *teacher conducted tool safety demonstrations* ($\Delta n = 321$; 39.64%), and *eye protection was required when working in the agricultural mechanics laboratory* ($\Delta n = 313$; 36.90%). The top three decreases in student exposure to safety education were in the following categories: *CPR instruction* ($\Delta n = -191$; -51.04%), *green house safety* ($\Delta n = -154$, -44.30%), and *student safety exams are kept on file at school* ($\Delta n = 13$; -21.64%). Overall, students received more safety education exposure in 11 of 18 competencies as measured by the instrument.

Conclusions/Implications/Recommendations

Based upon the 18 measureable competencies in the survey instrument, the majority of participants in the 2013 study received more safety education exposure than students in 2003. However, the majority of students surveyed did not receive CPR instruction by their agriculture teacher. Additionally, the majority of students did not witness nor receive injuries in the agricultural education laboratory that required on or off campus medical treatment. Implicative questions arose from the results of this study that include: (1) Are agricultural science teachers certified in CPR? (2) If yes, then why do they not instruct CPR to their students? (3) Should teacher education programs require that all new teachers be CPR certified? (4) Based upon the large number of students who were injured in agricultural education programs, should these laboratories be inspected for safety? These questions and others are grounds for future research in the area of agricultural laboratory safety. Based on the results of this study, the researchers recommend that all agricultural education laboratories be investigated to ensure that a safe learning environment is established for all students. Additionally, professional development programs should be established for all agriculture teachers who supervise student work in agricultural education laboratories — especially CPR training.

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An Evaluation of Attendees' Satisfaction with Topics Presented at an Educational Water Conservation Event

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An Evaluation of Attendees' Satisfaction with Topics Presented at an Educational Water Conservation Event

Introduction/need for research

The Texas Alliance for Water Conservation (TAWC) is a non-profit, agriculture focused organization with the purpose of educating West Texas farmers and ranchers about the most effective and efficient water management techniques and ultimately initiate a behavioral change in how these agriculturalists use their water. To accomplish its purpose, TAWC conducts research on a variety of water management techniques and then communicates with West Texas farmers and ranchers about the most effective water conservation techniques (TAWC, 2016). The TAWC uses a variety of communication and educational outlets to inform their target audience about water conservation. These activities include Field Days, Field Walks, board meetings, agricultural conferences, and educational tools and information (TAWC, 2016). However, the most popular and largest TAWC event of the year is the Water College. The goal of the TAWC Water College is to provide a positive learning experience that is conducive to facilitating a change in farmer's and rancher's behavior toward water conservation practices in hopes of increasing conservation technology adoption rates.

Conceptual framework

This study is based on Leagans' concept of needs, which states effective programs are developed by identifying individual and group needs and interests and arranging action that helps meet those needs (1964). In non-formal education, people are motivated to participate when they feel a need for the information or training provided, and if this need is not met satisfactorily, participation will diminish or cease (Richardson, n.d.). In agricultural and extension education, a needs assessment should be part of program planning, development, and evaluation (Etuk, n.d.). Recognizing and following steps of a structured needs assessment can enable more meaningful programs to serve the desired audience and meet their needs, and can often foster positive and meaningful changes to the way agricultural and extension education programs are developed (Etuk, n.d.).

Methodology

This study used descriptive survey research methodology with a one-time questionnaire distributed at the 2017 TAWC Water College. The target population for this study was all attendees at the 2017 TAWC Water College, and convenience sampling was used. The questionnaire was optional to fill out, and asked respondents to stay anonymous. Respondents were asked to indicate their satisfaction with the content presented by the guest speakers at the event using a 4-point Likert-type scale where 1= *Poor*, *2= Fair, 3= Good,* and 4=*Excellent*. Data were then recoded to create two groups with *Poor* and *Excellent,* where those who indicated *Poor* and *Fair* in one group, *Unsatisfactory*, and *Good* and *Excellent* in another, *Satisfactory*. Data analysis was conducted using SPSS® version 12.1 for Mac. A total of 51 responses were collected from a population of 196.

Results/findings

The most well-received presentation was over upcoming weather trends and patterns, with all respondents *(N* = 51) identifying it as *Excellent.* The second most well-received presentation was over water use techniques for cotton production, with almost all respondents (*n* = 49) identifying it as *Satisfactory*. The third best received presentation topic was on a comparison of LEPA, LESA, and PDMI irrigation technologies, with almost all (*n* = 48) respondents identifying it as *Satisfactory*. The least popular presentations were the topics of implications for cattle ranchers, with a higher number of respondents (*n* = 9) indicating it as *Unsatisfactory*, and the presentations given by representatives of Natural Resources Conservation Service (NRCS) and Texas Water Development Board (TWDB), with a higher number of respondents (*n* = 9, 13) indicating these as *Unsatisfactory*.

Table 1.
Water College Attendee's Satisfaction of Presentation Topics

Topic	Unsatisfactory	Satisfactory
Upcoming Weather Trends and Patterns	0	51
Water Usage Techniques in Cotton Production	0	49
Comparison of LEPA, LESA, and PMDI Technology	1	48
Implications for Cattle Ranchers	9	40
Natural Resources Conservation Service (NRCS) Update	9	36
Texas Water Development Board (TWDB) Update	13	36

N = 51

Conclusions

Based on the results from the questionnaire, attendees of the Water College preferred the topics of weather, water usage in cotton production, and the comparison of different irrigation technologies over other topics. This may be due in part to the demographics of these attendees and the fact almost all of them are cotton or other row crop farmers who would have more interest in these topics. The lack of satisfaction in the topics of implications for cattle ranchers and the updates from NRCS and the TWDB could be because they were more informative than educational. This study has shown the needs of the target audience of the TAWC as being focused on more educational and practical topics toward water management and conservation.

Implications/recommendations

Future studies of satisfaction with presentation topics would be more effectively assessed with the distribution of a pre and post-test to see what attendees learned or remembered most after the event. Extension educators can conduct a similar program evaluation as an opportunity to find

out what event participants want to learn in future extension programs and to help them tailor their program planning (Kiernan, 2008).

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Center for Agri-Science Communication: A Needs Assessment

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Introduction/Need for Research

The public's understanding of, engagement with, and attentiveness to science are limited (National Science Board, 2014). While a majority of the public holds scientist in high regards, the same cannot be said the other way around (Pew, 2009). Because of this, many scientific funding agencies are encouraging scientist to rethink traditional communication training (McCallie et al., 2009). They are being encouraged to shift away from media training and are being asked to include trainings aimed toward helping scientists foster an open dialogue directly with the lay public (McCallie et al., 2009). The hope is that this type of engagement will serve as a way to do more than simply convey the newest scientific discoveries to science-attentive publics (McCallie et al., 2009). The plant and soil science department chair expressed a desire to train doctoral students to enter academia or industry prepared to communicate their research. The Department of Plant and Soil Science (PSS) partnered with agricultural communications faculty to create a communications-training program called the Center for Agri-Science Communication (CASC). The purpose of this study was to determine how the CASC program could be better tailored to prepare our doctoral students to become better communicators in regards of relaying their research to the lay public. The objective of this study was to use a needs assessment survey to determine what exact needs the CASC participants needed to become better communicators. Doctoral PSS students were chosen to participate in this study due to the fact that the largest population of doctoral students in the College of Agricultural Science and Natural Resources (CASNR) are contained within this department. The researcher chose to include second and third year doctoral students due to the fact that they are actively working on their research while involved in CASC. This should give them the advantage of looking at what they are doing through the eyes of the lay public so that later they might be better able to synthesize the information to the lay public at a later time.

Theoretical Framework

Webler (2013) discussed how communication training helps scientists do a better job providing quality information to the lay public. This also means having informative discussions to help ensure scientists' views are part of public debates. The hope is that high quality communication between scientists and the lay public can help ensure science's legitimacy as a key source of knowledge in decision-making (Webler, 2013). When preparing to do this, the first steps in designing the curriculum for these adult learners is to conduct a needs assessment (Sork & Caffarella, 1989). Knowles, Holton, and Swanson (1998) provided two assumptions about adult learning that are important to keep in mind while in the needs assessment phase. These assumptions are that adult learner want to be "taught what they the need to know"(p. 3) and when developing curriculum, researchers have to "understand the learner's self-concept" (p. 3). Essentially, our participants need to know why they need to learn these communication strategies while keeping in mind they could resist and resent (learner's self-concept) situations in which they feel others are imposing their will on them (Knowles, Holton, & Swanson, 1998). Such assumptions about adult learning provide important reasons for using participants' input when beginning to develop curriculum.

Methodology

Descriptive survey methodology was used for this assessment. The researcher selected the target population as second and third year PSS doctoral students at Texas Tech University, which are participants for CASC. This population was selected because they are early in the dissertation

process and would have enough time to complete the two-year CASC program. The participants were emailed a link to the survey which was developed using Qualtrics, and the results of the study were then exported to SPSS There were eight general topic areas within this instrument that included demographics, online and social media, public speaking, in person engagement, interviewing for jobs, using multimedia and visuals, working with journalist, and other apprehension. The participants were asked a series of Likert scale questions, and at the conclusion were asked to rank the general topic areas, based on what they felt they needed the most help with (1 = most needed, 6 = least needed) as they get into their career fields. The survey was open from April 21st to May 2nd.

Results

The first round of research was to analyze and determine the communications training needs of CASC. As demonstrated in Table 1, the highest ranked need area was public speaking (*M = 1.38),* followed by interviewing for jobs (*M = 3.38).* Approximately 80% of participants self-identified as below average public speakers.

Topic	*M*	*SD*
Public Speaking	1.38	.870
Interviewing for Jobs	3.38	1.805
Using Multimedia and Visuals	3.69	1.251
Online and Social Media	4.08	1.498
In Person Engagement	4.08	1.847
Working With Journalists	4.38	1.121

Conclusion

This information helped the researcher understand why public speaking was ranked at the top. The needs assessment showed us that doctoral PSS students usually identify themselves as poor public speakers, but realize that they need to improve these skills. Although only one student stated that they knew how to contact a journalist, the participants as a whole didn't see a need to work with journalist. Through the needs assessment, the researcher was able to develop a series of monthly workshops that will officially begin in the fall semester of 2017. Each workshop will be specifically geared toward developing effective verbal and written communication that is built on agricultural communications principles. Over the next two years, the researcher will continue to plan workshops to decrease the participants' communication and writing apprehension, and will be measured (using the PRCA-24 measurement tool, and the Daly-Miller Test) at various times throughout the program to ensure that the research objective is being achieved, and ultimately benefiting these participants.

Recommendations

The researcher recommends setting a timetable to incorporate writing and communication apprehension evaluations after a set amount of time. Furthermore, the researcher recommends utilizing the PRCA-24 test and the Daly-Miller Test to measure apprehension accordingly. PRCA-24 test was developed by McCroskey (1984), and has a consistently high reliability and validity. The Daly-Miller Test was developed in 1975, and according to Pajares (1994) it consistently has a high validity and reliability. The final recommendation of the researcher is to utilize the results of the PRCA-24 and the Daly-Miller test to continue modifying the workshops so that you can maximize the potential gain of the CASC participants.

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Describing Consumers' Likelihood to Use Disclosure Methods for Identifying Bioengineered Food Ingredients

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Describing Consumers' Likelihood to Use Disclosure Methods for Identifying Bioengineered Food Ingredients

Introduction/Need for Research

The United States is the world's leading producer of bioengineered crops, based on acreage, in 2015 (James, 2015), producing corn, cotton, soybeans, apples, papayas, potatoes, sugar beets, squash, and canola oil. The topic of labeling bioengineered food is relevant in today's society because President Barack Obama signed the National Bioengineered Food Disclosure Standard on July 29, 2016. The law defined bioengineered food as any food that "contains genetic material that has been modified through in vitro recombinant deoxyribonucleic acid (DNA) techniques; and for which the modification could not otherwise be obtained through conventional breeding or found in nature" (p. 1). The law changes the way the food industry uses food labels to communicate with consumers, providing options for how to display information about bioengineered ingredients. All labels must be printed on the package and provide access to further information through a website link, telephone number, or a scannable Quick Response (QR) code (National Bioengineered Food Disclosure Standard, 2016). This research can be used by agricultural communicators to develop a strategic communication about bioengineered food with the agri-food industry using a new form of smartphone technology in accordance with Priority Areas One and Two of the National Research Agenda (Roberts, Harder, & Brashears, 2016). The purpose of this research study was to discover factors influencing consumers to use the disclosure methods and their purchasing intention of bioengineered food. Specifically, the objective addressed in this manuscript was to describe the likelihood consumers will use the different disclosure methods to learn whether products contain bioengineered ingredients.

Theoretical Framework

The diffusion of innovations theory (Rogers, 2003) contributed to the theoretical framework of this study. Rogers (2003) defined the innovation-decision process as the process through which a person passes from first knowledge of the innovation, to formatting an attitude toward the innovation, to deciding to adopt or reject, to implementation and use of the idea, and to confirm the adoption decision. From survey results of 800 general election voters, conducted by The Mellman Group, Inc. (2015), fewer than 1-in-4 respondents have ever scanned a QR code or bar code for learning about a food product. Seventeen percent of respondents have never scanned a bar code to get information, with only 5% scanning bar codes regularly. Furthermore, of the respondents whose primary responsibility is shopping in their households, 17% have scanned a bar code and 16% have scanned a QR code to get information. Of 525 adults surveyed, 4.86% of respondents claimed they would not have the ability to make a call or use smartphone-wireless internet or cellular network to look up ingredients using a QR code (Berning & Roe, 2017). These respondents were very likely (21.3%) or somewhat likely (32.3%) to scan QR codes with their smartphones to determine if ingredients were genetically modified. In regards to using an in-store scanner to scan QR codes, 22.9% were very likely and 31.3% were somewhat likely (Berning & Roe, 2017).

Methods

An online survey was distributed via the company SurveyMonkey to a non-probability, opt-in sample of 523 U.S. consumers 18 and older. There were 456 usable responses that were weighted using the 2010 U.S. Census figures to further enhance representativeness. A panel of

experts evaluated the questionnaire to establish face and content validity. Before data collection began, the study was approved by the university's Institutional Review Board. Questions about their likelihood to use food disclosure methods to determine whether products contain GM ingredients were reported in this manuscript. Data were analyzed using IBMTM SPSS® Version 21 to calculate descriptive statistics and frequencies.

Results

The majority of respondents were white (*n* =369, 70.6%) and female (*n* = 239, 52.9%). The mean age was 49 years with a range from 18 years to 89 years. Twenty-six percent of the respondents indicated their highest level of education was a graduate or professional degree (*n* = 117, 26.1%), followed by a bachelor's degree (*n* = 114, 25.4%), some college education but no degree (*n* = 107, 23.8%), high school diploma or GED (*n* = 56, 12.5%), and less than high school (n = 8, 1.8%). As shown in Table 1, across the two methods to disclose via QR codes through their smartphones or a store provided scanner to access bioengineered food information, roughly a quarter of the respondents were likely or extremely likely to use them.

Table 1
Likelihood to Use Disclosure Methods to Learn Whether Products Contain Bioengineered Ingredients

	Extremely Unlikely		Unlikely		Neither		Likely		Extremely Likely	
Disclosure Method	f	%	f	%	f	%	f	%	f	%
Scan QR codes with smartphone	143	27.3	103	19.7	102	19.5	80	15.3	29	5.5
Use in-store scanner to scan QR code	115	22.0	110	21.0	103	19.7	95	18.2	34	6.5
Call number given on back of food label	200	38.2	124	23.7	84	16.1	38	7.3	11	2.1
Read food label	53	10.1	44	8.4	74	14.1	156	29.8	127	24.3

Conclusions/Recommendations/Implications

A little more than half (54.1%) of the respondents were likely or extremely likely to read the food label for bioengineered ingredient information. This finding is likely reflective of how easy and faster it might be to read the food label because the consumers do not need internet access or a QR code app on their smartphones. Agricultural communicators could work with food manufacturers on designing food labels that provide the bioengineered information and ingredients list desired by consumers to aid their decision making. QR codes have the potential for agricultural communicators to improve agri-food industry transparency and expand manufacturer-consumer communication beyond the information that can fit on a product label. The agricultural communication profession could show that QR codes add value to conversations with consumers, well beyond GM labeling. Further research should investigate access to and preferences of the disclosure methods by specific demographic groups, particularly by age and household income. Other information sources and demographics should be added to the ordinal logistic regression. Research is needed to measure consumers' reactions to the types and amounts of information sought and received on the food packages because the U.S. Secretary of Agriculture has to determine the language and symbols used in any disclosure.

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Describing the Achievement Goals of Participants in a Career Development Event Workshop

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Introduction/Need for Research

The National FFA Organization boasts that a total of 235 unique careers in agriculture exist, and Career Development Events (CDE) provide participants with the authentic experiences to prepare students for these careers (National FFA Organization, 2016a). In a nation-wide study, Talbert and Balshweid (2006) reported that over 60% of members had participated in a CDE. Literature concerning students' motivation to participate in a CDE has primarily involved students during or after the point they had participated in a state or national level CDE, and the results are mixed (Croom et al., 2009; Curry et al., 2016; Knobloch et al., 2016). Knobloch et al. (2016) stated, "It is likely that the purpose and potential benefits of CDEs are clearly understood by students when they make a decision to participate" (p. 24). The purpose of this study was to describe the types of achievement goals of Oklahoma FFA members to initially participate in a CDE. This study occurred prior to the contest season when students were being introduced to CDEs. Results from this study could bring added information to school-based agricultural education (SBAE) teachers pertaining to the initial motivation for students to choose to participate in a CDE. Four research objectives guided this study: 1. Describe the population of secondary students participating in the Oklahoma State University (OSU) CDE workshop. 2. Identify if students are interested in a future career related to their CDE. 3. Identify the achievement goals for students participating in a CDE workshop. 4. Compare achievement goals for male and female CDE workshop participants. Research from this study aligns with the AAAE National Research Agenda 2016-2020 Priority 5: Efficient and effective agricultural education programs (Roberts, Harder, & Brashears, 2016).

Theoretical Framework

Elliot, Murayama, and Pekrun (2011) expanded the achievement goal construct into a 3 x 2 model that includes six goals that framed this study. Achievement goals are described as "a purpose for engaging in behavior in an achievement situation" (Elliot, 2005). Elliot proposed dividing the performance goal construct into approach and avoidance motivational components (Elliot & Harackiewicz, 1996). As a way of evaluating the constructs, Elliot stated, "[I]n general, approach-based goal pursuit is much more pleasant phenomenologically and is better suited to facilitate efficient and effective task engagement" (Elliot et al., 2011, p. 634). The 3 x 2 achievement goal model's ability to explain and categorize achievement behavior can be applicable to the competitions that are a major part of school based agricultural education.

Methodology

FFA members from Oklahoma participating in the OSU CDE workshop were the target population for the study. The one-day workshop was open to all students in Oklahoma and was advertised through the Oklahoma FFA webpage and SBAE teacher listserv. Along with demographic items, participants were presented with 18 statement items adapted from the 3 x 2 Achievement Goal Questionnaire (Elliot, et al., 2011) that represented types of goals they may or may not have to participate in a CDE workshop. Elliot et al. (2011) established *a priori* Cronbach's alpha scores for task-approach ($\alpha = .88$), task-avoidance ($\alpha = .86$), self-approach ($\alpha = .83$), self-avoidance ($\alpha = .87$), other-approach ($\alpha = .92$), and other-avoidance ($\alpha = .91$). The Cronbach's alpha reliability estimates for this study included task-approach ($\alpha = .82$), task-avoidance ($\alpha = .89$), self-approach ($\alpha = .86$), self-avoidance ($\alpha = .82$), other-approach ($\alpha = .93$), and other-avoidance ($\alpha = .93$). The reliability scores for each achievement goal construct were acceptable (Field, 2013), with Cronbach's alpha scores above .80. Face and content validity were assessed through a panel of experts. The student participants were selected through convenience

sampling; therefore, the results are not generalizable beyond the participants in the study (Privitera, 2017).

Results/Findings

The majority of the 73 participants were female (58.9%), compared to males (41.1%). Ninth grade students were the most represented in this study at 37%. Most of the participants were in grades 8 through 10 (66%), and the remaining 34% were in grades 11 and 12. Most participants (64%) reported that they had participated in 0 or 1 CDE before, and 95% reported participating in 4 or less CDEs. Results from the study showed 46% of participants indicated they were not interested in a career related to their CDE. Task avoidance was the highest goal orientation for students that were interested in a career related to their CDE (M = 5.36, SD = 1.63), and for those that were not (M = 5.41, SD = 1.33). Table 1 shows the mean values of the six achievement goal constructs.

Table 1.

Descriptive Statistics for achievement goal instrument (N = 73)

	Total (N = 73)		Male Students (n = 30)		Female Students (n = 43)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Task-avoidance	5.31	1.56	5.32	1.44	5.30	1.65
Self-avoidance	5.17	1.57	5.01	1.69	5.27	1.50
Task-approach	5.15	1.45	5.12	1.48	5.17	1.44
Other-avoidance	4.96	1.70	4.99	1.74	4.94	1.69
Other-approach	4.93	1.81	5.20	1.54	4.74	1.97
Self-approach	4.50	1.75	4.77	1.90	4.81	1.67

Note. Scale = 1-7; 1 = Not true of me, 7 = Extremely true of me

Conclusions

Younger, inexperienced CDE competitors from this study appear more concerned with avoiding failure than approaching success. Elliot et al. (2011) noted that avoidance-based goals tend to distract from full commitment to the task, and can cause concerns in regards to confidence. The lack of experience reported by the participants could account for the students' focus on avoiding incompetence rather than focusing on success. Students were least concerned with self-approach goal, or "doing better than before" (Elliot et al., 2011). Most students being novice or having no previous experience with CDEs could explain that result. Almost half (46%) of participants reported that they were not interested in a career related to their chosen CDE in the workshop, which supported the findings from Croom et al. (2009). Although both male and female students reported task-avoidance as their highest goal, male students are more motivated by the other-approach goal than female students, which would indicate that males are more motivated by "doing better than others," (Elliot et al., 2011, p. 634) than female students.

Implications/Recommendations/Impact on Profession

Oklahoma SBAE teachers should investigate strategies that shift students' goal orientation from avoidance-based to approach-based, when necessary. SBAE teachers should consider placing students in CDEs that relate to their career interests in order to align with FFA's goal of college and career readiness. The results of this study add to the literature pertaining to student motivation towards CDEs, but more research is necessary to address the mixed-results within CDE motivation research in order to better describe the reasons different populations of students initially choose to participate in CDEs.

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Poster Type: Research

Employability Skills Gained as a Result of Entrepreneurial Livestock Oriented Supervised Agricultural Experiences: A Modified Delphi Study

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Poster Type: Research

Employability Skills Gained as a Result of Entrepreneurial Livestock Oriented Supervised Agricultural Experiences: A Modified Delphi Study

Introduction

Entrepreneurial livestock programs are one of the most popular supervised agricultural experience (SAE) components of school-based agricultural education (SBAE) programs in Oklahoma (Oklahoma Department of Career and Technology Education, 2016). Highlighting the acquisition of employability skills, such as basic academic skills, higher order thinking skills, and personal qualities (Hillage & Pollard 1998) through participation in entrepreneurial livestock SAEs has potential to reinforce "entry or advancement in agricultural occupations and professions" (Phipps, Osborne, Dyer, & Ball, 2008, p. 3), which is a fundamental goal of SBAE programs. The acquisition of employability skills is important, as twenty-one million people are employed directly in agriculture or agriculturally related careers (Duvall, 2017). Therefore, it is essential for administrators, instructors, and prospective employers to recognize the potential for the acquisition of employability skills when students are involved in SAE programs. To that end, the purpose and primary objective of this study was to identify the employability skills acquired by students who engaged in entrepreneurial livestock SAE programs.

Theoretical Framework

Experiential learning is a key pedagogy used in SBAE programs (Baker, Robinson, & Kolb, 2012) and thus guided this study as a framework. All aspects of the program (i.e., classroom, FFA, and SAE) can serve students as a nexus for experiential learning. Student participation in the SAE component, as well as being supported by the classroom/ laboratory and FFA components of the agricultural education model, have the potential to lead to meta-level skills that are potentially reflected in the acquisition of employability skills. Involvement in SAE programs, has the potential to expose students to a variety of careers, learn proper workplace etiquette, develop skills within a specific area, and provide opportunities to apply learned knowledge in a simulated environment. Approaches such as these reinforce what is learned in the classroom and laboratory setting and reinforce the three-component model of Agricultural Education (2016-2017 Official Manual, National FFA Organization, 2016).

Methodology

The population for this study consisted of all SBAE instructors in [State] ($N = 433$). To identify the employability skills of students who engaged in entrepreneurial livestock SAEs, the researchers elected to purposefully identify and sample a jury of instructors exhibiting expert traits related to the objective of the study (Palinkas et al., 2013). The criterion utilized to determine the jury of experts included instructors whose students' SAE projects had been selected by the [State] FFA Association as a state proficiency award finalist in the 2015-16 school year in the areas of beef, swine, sheep, and goat entrepreneurship. As a result of this criterion, 43 instructors were included in the study's sample. A three-round, modified Delphi technique (Dalkey & Helmer, 1963) was employed to seek consensus on employability skills learned through entrepreneurial SAE programs. Qualtrics® was utilized to facilitate data collection. In Round One, three statements were presented to the jury; 1) identify the *basic academic skills* students acquire through a livestock oriented entrepreneurial supervised agricultural experience program, 2) identify the *higher-order thinking skills* students acquire through a livestock oriented entrepreneurial supervised agricultural experience program, 3)

identify the *personal qualities* students acquire through a livestock oriented entrepreneurial supervised agricultural experience program. Two additional rounds were used to seek consensus on the items identified as a result of Round One. In Round Two, panelists were asked to rate their level of agreement using a six-point scale and if necessary, re-write items as presented if they believed additional clarity was needed. Items that achieved 75% agreement or higher (i.e., *Agree* or *Strongly Agree*) were retained as those reaching consensus. However, items that did not achieve 75% agreement but more than 51% were sent back to the experts in Round Three. Round Two also provided an opportunity for jurors to add additional items that may have been missed in Round One. The third and final round sought to refine consensus on items that reached more than 51% but less than 75% agreement in Round Two.

Results/Findings

Round One yielded 55 responses. Similar or duplicate statements were combined or eliminated (Shinn, Wingenbach, Briers, Lindner, & Baker, 2009) resulting in 31 responses for presentation in Round Two. Round Two resulted in *consensus of agreement* on 26 responses reflecting all three statements presented to the jury, i.e., 75% or more of the jurors selected 5 *(Agree)* or 6 *(Strongly Agree)*. The statement, basic academic skills, resulted in two skills that reached consensus of agreement. The statement, higher-order thinking skills, resulted in nine skills that reached consensus of agreement. The third statement, identify the personal qualities, resulted in 15 items that reached consensus of agreement. Round Three included three responses, two from basic academic skills and one from higher-order thinking skills. After consideration of the three items, the jury determined no additional items met consensus in Round Three. After three rounds of the study, 26 responses reached consensus of agreement. The following distribution of responses was reflected: Basic Academic Skills = 2 items; Higher-Order Thinking Skills = 9 items; Identify the Personal Qualities = 15 items.

Conclusion

This study highlights the potential for livestock oriented SAEs within the SBAE model to facilitate the acquisition of employability skills. Further, Delphi jurors listed 26 employability skills that, according to Robinson (2000), represent basic academic skills, higher-order thinking skills, and personal qualities that may be gained through entrepreneurial SAE programs.

Implications/Recommendations/Impact on Profession

Making the connection between employability skills and the potential to reinforce basic academic skills (i.e., oral communication, basic science); higher-order thinking skills (i.e., decision making, problem solving); and personal qualities (i.e., responsibility, dedication, and work ethic) with stakeholders, school administrators, and parents complements the efforts of the SBAE program to contribute to student achievement. Research should be conducted to determine additional factors needed to postulate an SAE model that would prepare students for entry-level employment in the agricultural industry. Based on findings of this study, career preparedness should play a more integral role in the development and implementation of entrepreneurial livestock SAE programs. Finally, state staff, professional teacher organizations, teacher educators, high school administrators, and community stakeholders should join forces to advise SBAE instructors in planning and implementing entrepreneurial livestock SAEs utilizing the agricultural education model while highlighting the acquisition of employability skills through the development of basic academic skills, higher-order thinking skills, and personal qualities.

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Employer Perspectives of Agricultural Students' Communication Skills: Curriculum Considerations Based on Real-World Input

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Employer Perspectives of Agricultural Students' Communication Skills: Curriculum Considerations Based on Real-World Input

Introduction and Theoretical Framework

Scientific communication skills are often overlooked in food, agriculture, natural, and human sciences' classrooms because of an intense focus on technical knowledge. However, the need for improved scientific communication skills has been documented in the literature (Crawford, Lang, Fink, Dalton, & Fielitz, 2011) as graduates are expected to disseminate and transfer scientific information to broad audiences. Writing intensive courses can reduce students' writing apprehension and encourage writing confidence (Fisher & Meyers, 2017), but universities continue to look for ways to improve students' communication skills. Crawford et al.'s 2011 study identified listening effectively, communicating accurately and concisely, communicating orally, communicating pleasantly and professionally, communicating in writing, asking effective questions, and communicating appropriately and professionally using social media as seven key areas of communication.

The National Research Council (2009) expressed concern that "little communication" (p. 3) occurs between academics and industry. Therefore, there is a need to understand employers' perspectives of the communication areas identified in the Crawford et al. (2011) study to improve curriculum so that it meets industry needs. Within the profession, the American Association for Agricultural Education National Research Agenda (2016) calls for studies to address needed workforce competencies across agriculture and natural resources areas (Roberts, Harder & Brashears, 2016). This study addressed the identified needs by seeking guidance from industry in regard to curriculum needs and assessing industry needs for communication.

Human capital theory guided this study. Capabilities, training, knowledge, experience, and abilities each contribute to human capital, and entities seek to capitalize on these attributes to benefit the company (Vargas, Lloria, & Roig-Dobon, 2016). Entities are often willing to provide on-the-job training for employees to acquire beneficial skills but would prefer for employees to join the company equipped with the needed skills (Raffiee & Russel, 2016). Communication skills are critical within the context of human capital.

Purpose and Methods

The purpose of this study was to investigate employers' perspectives of communication skills of students they hired in the past as well as understand their potential needs in future hires. To investigate employers' perspectives, we used qualitative interviews that focused on Crawford et al.'s (2011) seven areas of communication. We, one assistant professor and one associate professor in agricultural leadership, education, and communications, interviewed 17 employers who attended a spring career fair and frequently hire graduates. Employers represented companies related to animal industries, construction, retail, fertilizer, feed/seed, produce, equipment manufacturers, and professional services. All the employers hired students in the past and were on campus with the goal of recruiting new hires. The employers were appropriate because they possessed knowledge of graduates who had been hired by their company and could share meaningful information given their experience (Merriam & Tisdell, 2016). The interviews lasted between eight and 15 minutes and asked employers to rank communication skills mentioned in Crawford et al.'s (2011) seven areas of communication and indicate the importance

of communication skills. We conducted each interview simultaneously with individual employers and met in a separate room to debrief following each interview. Each employer was assigned a code in the order they were interviewed to allow an audit trail within and across the data (Erlandson, Harris, Skipper, & Allen, 1993). We also maintained a journal to increase trustworthiness and credibility and used the constant-comparative method to identify categories within the data (Glaser & Strauss, 1999). We received institutional review board approval to conduct the study.

Findings

All employers indicated communication skills were important. In fact, one employer (C02) specifically indicated communication skills were of paramount importance, possibly more important than content-specific scientific knowledge. Employers emphasized that two specific aspects of communication were very important: interpersonal skills (C01, C06, C11) and active listening (C07, C09, C16). In regard to oral communication, employers indicated public speaking (C05, C17), speaking clearly (C07), and phone etiquette (C07) were essential. Regarding written communication, employers expressed professional written communication (C16) via both email (C06) and business letters (C07) were important. Employers also stated they wanted to hire individuals who could communicate effectively using technology (C03), translate scientific information into common terms (C06), and summarize complex scientific material (C08, C11). In addition to communication-specific skills, employers also noted understanding sales (C02, C04) and communicating with confidence (C04, C05, C09) as critical. Additionally, we asked employers to rank Crawford et al.'s (2011) seven areas of communication. Eight employers indicated oral communication was extremely important. None of the employers indicated writing as the most important aspect of communication, but four of the employers indicated listening effectively was the most important. Last, all employers ranked social media as the least important of the seven areas of communication.

Conclusions, Implications and Recommendations

Based on findings, employers value effective communication skills that can be readily applied in the industry setting and, thus, contribute to the human capital within their company. They desire for universities to incorporate more activities into the university curriculum to enhance the seven areas of communication skills. Because they expressed a stronger need for oral communication over written communication, universities should look for ways to strengthen oral communication skills. Faculty should review curriculum to ensure the activities being implemented within the university classroom benefit employers. Further, writing-intensive courses often involve written papers rather than research briefs, letters, emails, or speaking points. Thus, there is a need to incorporate real-world communication activities from industry into the university food, agriculture, natural, and human sciences classroom. The findings in this research is new for the agricultural education field and will provide a baseline from which to improve current communication coursework. Research is needed to determine the most effective means of incorporating activities to enhance communication skills, and researchers should conduct experimental studies to determine skill and knowledge attainment as well as knowledge transfer as a result of the activities.

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Enrollment Trends in Animal Related Courses in Texas Secondary Education Based on Ethnicity

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Enrollment Trends in Animal Related Courses in Secondary Education Based on Ethnicity

Introduction

Goecker (2015) expects that from the years 2015-2020, United States graduates with a background in agriculture, food and natural resources will be able to come across and secure careers, with nearly half of those careers being in management positions. However, with 57,900 average openings annually, and only 35,400 U.S. graduates with an expertise in the field, employers must turn to graduates of other educational backgrounds in order to fill positions.

Research has found that some of the biggest barriers to recruiting high school students into agricultural education programs are the characteristics of the course, pressure from personal connections such as peers or family, and the interest in the field (Myers et. al, 2004). Some secondary education students do not understand the importance of agriculture in their communities and its effect on their lives (Gliem, & Gliem, 2000). In Talbert & Larke's (1995) study, they predicted that while the white population in Texas would no longer be the majority, other ethnicities would still be underrepresented in the field of agriculture.

Theoretical Framework

The United States greatly depends on the agricultural sector, yet with each year, less individuals go into the field (Warren, & Alston, 2007). Talbert & Larke (1995) recommended that recruiting in high school was long overdue, and recruitment should begin in elementary and middle school. By high school, most students already have a perceived idea of agriculture and whether they would pursue it as a career. However, LaVergne, Larke, Elbert, & Jones (2011) reported that there was no research progress showing a modification or change of agricultural classrooms to recruit these individuals. The purpose of this study was to describe enrollment trends based on ethnicity in animal related courses in the secondary agriculture, food and natural resource programs.

Methodology

This study was designed to describe enrollment trends based on ethnicity in animal related courses and animal related secondary agriculture food and natural resource courses in Texas. The population for this study consisted of secondary students enrolled animal related courses. These were aggregate enrollment data from the public domain and no individual subjects were used for this study. Data were collected from the Texas Education Agency report on enrollment for secondary food and natural resource classes in Texas for the years 2013, 2014, and 2015. Data were analyzed and reported using descriptive statistics.

Results

The percentage of American Indian or Alaska Native and Native Hawaiian/Other Pacific is less than 1% in all three academic years reported for the animal systems pathway courses. Asian student enrollment in the foundation course is less than 1%, while the percentage of Asian student enrollment increases from less than 1% to 1% in Veterinary Medical Applications and is

reported at 2% enrollment for Small Animal Management in 2013-2014, and 1% in 2014-2015 and 2015-2016. The enrollment of two or more race students is 2% in all of the animal systems career pathway courses with the exception of Advanced Animal Science. In 2013-2014, there was a 1% enrollment of two or more race students in Advanced Animal Science, and a 2% enrollment in the academic years 2014-2015 and 2015-2016.

The enrollment of black or African American students in Equine Sciences remained at a constant 8% throughout the academic years reported. The only course enrollment of black or African American students that was higher than that of the foundation course was in Small Animal Management with 9% in 2013-2014 and 11% in 2015-2016. The lowest enrollment percentage of Hispanic/Latino students was in Equine Sciences, going from a 29% enrollment from 2013-2014 and 2014-2015 to 32% in 2015-2016. In the other animal systems career pathway courses, the enrollment of Hispanic/Latino students is the second highest with over a 30% enrollment after the enrollment of white students.

The percentage enrollment of white students in both the foundation course and the courses in the animal systems career pathway decrease with each academic year. The percentage of white student enrollment was highest in Equine Science, and was lowest in Small Animal Management, with 51% enrollment in 2013-2014, 48% enrollment in 2014-2015, and 46% enrollment in 2015-2016.

Conclusions

When comparing the student enrollments in AFNR and student enrollment in Texas high schools, there are some consistencies. The enrollment of American Indian/Alaska native students has decreased in the three academic years in both cases, but the enrollment rate is higher in the animal systems career pathway courses than in high school. Students of two or more races' enrollment is fairly consistent throughout the three academic years reported, with 1.80% and 1.70% enrollment in high school and AFNR, respectively. Native Hawaiian/Other Pacific student enrollments are the lowest in both cases, with 0.14% and 0.06% in high schools and the animal systems pathway, respectively. Asian student enrollment in Texas high schools was 3.80% in 2015-2016, but only 0.80% in AFNR. Similarly, black or African American student enrollment in Texas high schools in the same year was 12.78%, but only 8.43% in the animal systems pathway. In the academic year 2015-2016, the Hispanic/Latino student enrollment became half of the enrollment in Texas high schools, with the white student enrollment coming second with 30.59%. However, white student enrollment is 50.32% in the animal systems pathway in the same year, with Hispanic/Latino student enrollment coming second with 38.25%. This confirms Talbert and Larke's (1995) prediction that while the white population in Texas would not be the majority, there is still an underrepresentation of other ethnicities in the field of agriculture.

Recommendations

Based on the findings, one recommendation would be to increase the opportunities to offer nontraditional animal related courses in secondary education, such as Veterinary Medical Applications and Small Animal Management. This could result in a more diverse participation overall in secondary agriculture, food and natural resources.

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Evaluating the Effectiveness of an Agricultural Literacy Preservice Teacher Workshop

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Evaluating the Effectiveness of an Agricultural Literacy Preservice Teacher Workshop

Introduction

The Agriculture in the Classroom (AITC) program seeks to "increase agricultural literacy through K-12 education" ("About Agriculture in the Classroom," 2017). The AITC mission statement states that by "encouraging teachers to embed agriculture into their classroom, AITC cultivates an understanding and appreciation of the food and fiber system that we all rely on every day" ("About Agriculture in the Classroom," 2017). The Agricultural Literacy Logic Model (Spielmaker, Pastor, & Stewardson, 2014), using the theory of change construct, posits that outputs or interventions such as teacher preservice programs are one way to increase agricultural literacy among teachers and their students. Annually, the Utah AITC program conducts an elementary preservice teacher workshop for nearly 700 preservice teachers during either their science or social studies methods course at eight higher education institutions. The workshops have been conducted for nearly a decade and to date, no evaluation data of this program has been collected or analyzed. Rather, program leadership considered invitations back each year, by methods professors, as indicators of impact. This research examines the perceived increases in agricultural literacy among preservice teachers (after engaging in a three-hour workshop), the overall workshop experience, and participant interest in a follow-up survey.

Theoretical Framework

The *theory of change*, as outlined in the Agricultural Literacy Logic Model, was the overarching theoretical construct for this agricultural literacy intervention. The Utah AITC preservice programs were considered an output intervention with the desired outcome of increasing agricultural literacy among participants that would result in the short-term, planned behavior to use their newly gained understandings and resources in their future teaching. The Utah AITC workshops for elementary preservice teachers are operationalized using Kolb's Experiential Learning Model where "learning is the process whereby knowledge is created through the transformation of experience" (1999, p. 41). Kolb's model is rooted in the experiential learning philosophies of John Dewey. Dewey theorized that learners who connect to their prior learning and through continued learning experiences are able to make meaning and apply their understanding in different situations (Dewey, 1938). The Utah AITC three-hour presentation used a constructivist approach (also rooted in experiential learning, Fenwick, 2003) to engage preservice teachers with hands-on activities (soil erosion models, wheat threshing, seed planting, seed and flower dissection, wool spinning, etc.) and connected these activities to the food, clothing, and shelter that was part of their daily lives (connecting to prior learning). These activities are part of the Concrete Experience mode in Kolb's model. Preservice teachers then reflected on their activities in an oral sharing, the Reflective Observation mode of Kolb's model. The participants engaged in Abstract Conceptualization by using concept maps and a categorization activity (graphic organizer) of the products they use every day. The final mode of Kolb's model is the active experimentation. The preservice teachers were provided with resources and a website of free classroom-ready lesson plans and supportive materials and asked to tryout the resources when they became teachers.

Methodology

This research used a post-intervention survey to answer the following research questions:

1) Do preservice teachers who attended a/an Utah AITC workshop experience a perceived increase in their level of understanding related to the National Agricultural Literacy Outcomes?
2) Did participants find the workshop efficacious and valuable in terms of: organization, pacing, engagement, and relevance of content to elementary education?

Post-workshop data was collected for three semesters (fall 2015 through spring of 2017) using the online Qualtrics software. The population for this time period asked to complete the survey was 642 preservice teachers. Preservice teachers were asked to complete a 15 question, five point Likert-scale (1= Strongly Disagree to 5 = Strongly Agree) survey related to the presentation and an additional question about their willingness to participate in a future survey. Thirteen questions were developed based on the content of the workshop and the corresponding National Agricultural Literacy Outcomes (NALOs) (Spielmaker & Leising, 2013).

Results

Out of the 642 preservice teachers participating in the targeted workshop, 240 completed the survey, yielding a response rate of 37%. Addressing research question 1, participants reported an increase in agricultural understanding in all surveyed areas. The highest mean averages occurred in topics related to gaining a deeper appreciation for agriculture (M = 4.66, SD = .63); increasing understanding in the resources that produce food, clothing, and shelter (M = 4.55, SD = .67); and the value of agriculture in daily life (M = 4.56, SD = .69). The lowest mean averages occurred in topics related to understanding the costs associated with producing and purchasing food (M = 3.77, SD = .93); and describing the technologies farmers use to increase yields and improve product quality (M = 3.79, SD = .96). However it should be noted that these scores are still between “neither agree or disagree” and “agree.” Presentation effectiveness scores (1 = very poor, 5 = very good) had a mean score of M = 4.86. When parceled out, the participants reported the topic was very relevant (M = 4.87, SD = .42) to elementary education. Participants stated they were slightly more likely to explore the website than commit to using specific resources in the future. Twenty-four percent stated that they would be willing to be part of a follow-up study.

Conclusions

These evaluation results indicate that participants perceived an increase in their understanding related to the NALOs. They also reported that they were likely or very likely to integrate agriculture into their instruction and planned to use the Utah Agriculture in the Classroom website and related curriculum resources.

Recommendations

An attempt should be made to follow-up with non-responders to determine if similar results would be obtained on the measures. In addition, the self-reported levels of “increased in understanding,” need to be assessed with actual content-based assessments to determine the accuracy of the self-reported scores. And finally, a follow-up survey about the usefulness of the workshop and resources should be conducted with the 129 preservice teachers who stated they would be seeking a teaching position.

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Exploring the Motives for Leaving Teaching among SBAE Temporary Leavers

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Exploring the Motives for Leaving Teaching among SBAE Temporary Leavers

Introduction/Need for Research

One of the biggest challenges facing school-based agricultural education (SBAE) today is the lack of qualified agriculture teachers necessary to meet demand (Foster, Lawver, & Smith, 2014; Myers, Dyer, & Washburn, 2005). Addressing this issue requires efforts in both recruitment and retention. In an effort to establish a sufficient scientific and professional workforce that addresses the challenges of the 21st century (Stripling & Ricketts, 2016), this research focused on retention by examining the reasons for leaving among SBAE teachers who left teaching and then later returned. One issue cited in the literature for early SBAE teacher turnover is difficulty balancing work and family roles (Chaney, 2007; Foster, 2001; Kelsey, 2006; Murray, Flowers, Croom, & Wilson, 2011; Sorensen & McKim 2014; Sorensen, McKim, & Velez, 2016). In a study exploring teacher turnover among teachers of all disciplines, Stinebrickner (2002) concluded, "A very substantial amount of teacher attrition is directly related to the birth of new children" (p. 208). Despite this, evidence suggests teachers who leave the profession to have a child often return to teaching. Estimates suggest up to one quarter of the teachers hired each year, are temporary leavers, teachers who had once taught before (Wayne, 2000). Because of the dearth of literature in agriculture education regarding temporary leavers, this study sought to describe their characteristics, particularly reasons for leaving.

Theoretical Framework

The theoretical framework for this study was the human capital theory which can be applied to occupational decision making (Becker, 1994). This theory posits individuals (e.g., teachers) make methodical evaluations of net monetary (e.g., income, promotion opportunity) and non-monetary resources (e.g., stress, satisfaction, work environment, colleague relationships) of current and alternative career options. Based upon those evaluations, individuals make decisions to either leave or remain in their current occupation depending on which options maximize their net returns. As individuals stay and train in a certain profession, capital, like occupational specific training, professional contacts, or tenure is accrued. The more capital an individual has in one type of occupation, the more likely they are to remain. This theory applies also to inter-role conflict in which one potential occupation choice for teachers is the role of parenthood. For many agriculture teachers, particularly females, the choice to leave teaching to raise a family can be a very difficult one to make (Foster, 2001, Murray et al., 2011). The human capital theory can help explain the reasons temporary leavers of SBAE leave teaching for a time.

Methodology

The target population for this study consisted of all secondary agriculture teachers in the United States during the 2014-2015 school year and who self-identified as a participant in the family role. A simple random sample of SBAE teachers from the National FFA Organization (n = 667) was obtained. Surveys were distributed electronically to participants, which yielded a usable response rate of 35% (n = 234). From those 234, only respondents who had taken an extended leave from teaching were included in this analysis. A total of 22 respondents (9.4%) of the total were included in this study. Early and late-respondents of the total (n = 234) responders

were compared in an effort to check for response bias and no significant differences were found among them. As part of a larger study, the instrument was designed to gather descriptive information about participants' personal leave history, including whether they had taken an extended leave from teaching (more than one school term), for how long, and the reasons for leaving. Data were analyzed using descriptive statistics. The reasons for which the participants indicated leaving teaching early were condensed into common themes and reported using descriptive measures.

Findings

Among the respondents, 22 (9.7%) reported taking a leave from teaching for an extended period of time. Of those who reported taking a leave from teaching, 14 (10.3%) were male while 8 (8.8%) were female. The length of time in which respondents reported taking a leave from teaching ranged from one to 24 years. The mean length of time in which respondents reported taking a leave from teaching was 5.5 years (SD = 7.42). When comparing the length of time for extended leave by sex, male (M = 6.86, SD = 10.15) teachers took significantly more time away from teaching than females (M = 1.70, SD = 1.99); $t(16) = -2.18$, $p = .045$. Teachers' sex yielded a large (Cohen, 1988) effect size for length of time away from teaching (Cohen's $d = .71$).

Respondents were asked to provide an open response regarding the reason for taking the leave from teaching. The most common responses included caring for children/to be with family (n = 8, 36.3%), pursuit or exploration of another career (n = 7, 31.8%), and unsatisfied/burned out/needed a break (n = 3, 13.6%). Other responses included sabbatical leave, firing, job relocation, and spouse's career. Every respondent who reported leaving for the pursuit of another career (n = 7) was male, while every respondent who reported leaving to care for children/be with family were female (n = 8). Additionally, every respondent who reported leaving because they were unsatisfied, burned out, or needed a break were male (n = 3).

Conclusions and Recommendations

The small proportion (9.4%) of temporary leavers in this study suggests that either few teachers who leave teaching ever return, or not many ever take an extended leave from teaching. More research should be conducted to answer that question. Despite the small sample of temporary leavers, it is important to note that all female temporary leavers left because of family reasons. This finding may explain the difference found in the amount of time away from teaching. Females likely tend to re-enter teaching as soon as children are of the age where arrangements can be made for their care, while males likely return for other reasons (e.g. economic, satisfaction). The fact that females leave primarily for family reasons is consistent with other studies in agricultural education suggesting females struggle with balancing work and family roles, due in part to traditional gender roles in society (Foster, 2001; Kelsey, 2006; Murray et al., 2011). Consistent with the human capital theory, males seem to leave teaching because the monetary benefits appear better (Becker, 1994). Perhaps the reason males returned to teaching is because of the non-monetary benefits (e.g., job satisfaction) associated with SBAE. We recommend qualitative research be conducted with temporary leavers to more fully explore the factors for leaving, returning, and the types of careers pursued after leaving teaching. This research could provide valuable information in addressing teacher turnover.

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Factors Affecting School Connectedness Among Agricultural Education Students in Colusa County, California

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Factors Affecting School Connectedness Among Agricultural Education Students in Colusa County, California

Introduction/Conceptual Framework

The high school graduation rate in the United States is currently 77 percent, lower than it was 40 years ago with an estimated 1.3 million students not earning their high school diploma in 2010 (Rotermund & Rumberger, 2013). The high number of students that fail to earn a high school diploma may be explained by the estimated 40-60 percent of all high school students that are disengaged from school (Klem & Connell, 2004). According to CDC there are four promotion factors that are related to school connectedness; adult support, belonging to a positive peer group, commitment to education, and school environment (CDC, 2009). Witt et al. (2012) found when educators better understand students and the actors that affect their sense of school connectedness, the more likely they will provide interventions to students who are likely to drop out of school or engage in negative health behaviors due to lower sense of school connectedness. One of the promotion factors that affects students' relationships to school connectedness is belonging to a positive peer group as peer relationships can form student perceptions, how a student sees his/her friends is likely to be how they see themselves and also how they connect to school (Juvonen, Espinoza, & Knifsend, 2013). Problems with student engagement and success remain an issue within education, yet schools aren't showing success implementing new procedures to change the problem. Agricultural education programs have characteristics that align directly with the promotion factors, however, little research has been done on the promotion factors in agricultural education that influence school connectedness.

Methodology

Addressing the research priority of *meaningful, engaged learning in all* environments (Roberts et al., 2016), this study sought to examine the promotion factors that influence students' school connectedness and elaborate on how they impact students. Specific research questions were: (1) How do students rate the levels of adult support, positive peer groups, commitment to education, and positive school environment factors present in their agricultural education program; (2) How do students in agricultural education programs describe the influence of school connectedness promotion factors on their sense of school connectedness?; and (3) How can the understandings that emerge from the qualitative data be used to provide deeper understanding of the influence of these school connectedness promotion factors present agricultural education programs on students' sense of school connectedness? A mixed method approach was employed in order to strengthen the statistical data with qualitative data that can provide supplemental information and explanation to the statistical data collected (Greene, Caracelli, & Graham, 1989). The first section of the questionnaire consisted of 54 Likert-type items made up of statements related to school connectedness (Lohmeier & Lee, 2011). Reliability of the instrument was assessed post-hoc calculating a Cronbach's alpha for each section of the survey with results ranging from .86 - .97. The second phase of this study was qualitative utilizing focus groups at each school in order to gain further understanding of the school connectedness promotion factors' level of presence and the degree of impact they had on students at each school. A moderator's guide developed by Witt (2012) was used to explore the school connectedness promotion factors and students' sense of connectedness on a broader more personal level. This study was a census of every student enrolled in an agricultural education classes in Colusa County ($N = 4$), a rural county in California with a population of approximately 21,000. Each high school superintendent and principal was contacted by email and asked for permission to conduct the study with their high school and the students enrolled in agricultural education programs. SPSS® software was used to analyze the quantitative phase of the study. Non-parametric statistics were used to determine how students rated levels of school

connectedness, adult support, peer group, commitment to education, and environment. The Kruskal-Wallis H-test was used to compare the students' sense of connectedness between each of the four schools by comparing two or more samples that are independent, and it is equivalent to the parametric one-way analysis of variance (Corder & Foreman, 2014). Analysis of the qualitative phase involved transcribing the audio recordings from the focus group (30 - 90 minutes in length) and then coding the transcription. Once coding began the transcripts were analyzed and coded together due to similarities and themes in the information the students provided using three phases, open coding, axial coding, and selective coding (Gibbs, 2007).

Findings

Research Question 1: The mean scores indicated students' perceptions of the presence of the school connectedness promotion factors in their agricultural education program rating all factors above the scale mid-point with statements related to peer group ($M = 3.84$) and positive environment ($M = 3.78$) as the highest promotion factors in their agricultural education programs. Students also rated the other two promotion factors above the mid-point level, commitment to education ($M = 3.66$) and adult support ($M = 3.64$).

Research Question 2: A total of 26 students from four high schools participated in the focus groups with one focus group conducted at each high school in the agriculture classroom on each campus. All students were between the ages of 14 and 19 and were freshman, sophomores, juniors, or seniors enrolled in a high school agricultural education class and either white or Hispanic. When discussing *connectedness*, several different topics were brought up with the three most common discussed topics being cliques, people finding out everything about others and being judgmental, and status or last name. When discussing *their schools*, students talked about school staff, coaches, and their agriculture teachers. Students mentioned both the good qualities and things they like as well as the things they didn't like that made them feel like the staff (e.g. coaches) did not care. When discussing their *agriculture teachers*, students discussed how supportive and encouraging agriculture teachers are, how much time their agriculture teacher dedicates to students, and their agriculture teacher's personality and attitude in a positive light. Students at each of the schools had multiple opinions on different topics when asked about their ag classes or their ag program. Common topics that were brought up were positive and negative factors to their ag classes or program with most frequent topics being the real world and hands-on experiences that they get by having an ag class or ag program in general and how the experiences help them. Students also brought up topics that they felt were more negative about the ag classroom or program such as the teacher, organization, planning, and students' behavior in class. At each school students talked about how the teacher's behavior and actions regarding favoritism, singling students out, and gender, impact the environment.

Research Question 3: From the school with the lowest school connectedness, several items emerged from the focus groups conducted that provide deeper understanding or explanation for the significantly lower score. Items that emerged were favoritism, the teacher being older, cliques, and lack of school spirit.

Conclusions and Discussion

Aa deeper understanding to questions regarding students' sense of school connectedness in their agricultural education program emerged as almost every student in each focus group talked about some form of extracurricular activities whether it was sports, FFA, or another organization. Aside from extracurricular activities, the qualitative data collected aligned with the CDC's (2009) four connectedness promotion factors. The data was able to distinguish the difference between the negative adult support and the positive adult support. This insight found positive teachers, and teachers who helped promote education and students saw opportunities more highly. Teachers that put in no effort or acted as though they did not care caused students to reflect that same attitude towards the classes taught by those teachers.

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Poster Type - Research

Implementing Learner-Centered Teaching Approaches in Ghana

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Introduction/Need for Research

The Ghanaian Ministry of Education has responded to prior research and recently called for a transformation in their education system from restrictive, teacher-centered instruction, to a more learner-centered approach with the purpose of improving economic outcomes throughout the country (Psacharopoulos & Patrinos, 2004). Although these methods are supported by the Ghanaian government, international aid agencies, and other non-governmental organizations, implementation of these methods has yet to be seen in schools (Dei, 2004). The literature revealed several themes regarding the difficulty of implementing learner-centered education in Ghanaian education, however the studies we reviewed predominantly utilized pre-service teachers (Akyeampong, 2002 & Akyeampong, Pryor, & Ampiah, 2006). Many studies identified barriers to implementing learner-centered strategies, highlighting the need for more professional development for in-service teachers (Vavrus, Thomas, & Bartlett, 2011). However few studies measured the rate of adoption following a learner-centered strategies training program specific to secondary agriculture programs (Mizrachi, Padilla, & Susuwele-Banda, 2010; Kroma 2003).

The purpose of our study was to determine which learner-centered techniques secondary Ghanaian teachers are most likely to implement in their own classrooms after completing a three-day training program. Pre and post surveys were administered to participants assessing demographic data, prior knowledge of the session topics, current teaching techniques, and likelihood of adoption after training. The goal of our research was to assess current teaching strategies Ghanaian teachers use as well as identify which learner-centered teaching strategies they are likely to adopt. We implemented this research through partnership with AgriCorps, a U.S. based non-profit organization dedicated to improving agricultural education and practices in developing nations. As a result of our partnership, we were able to work with in-service agriculture teacher participants to improve their teaching practices.

Theoretical Framework

The theoretical framework of this study was the transtheoretical theory which focuses on the stages and processes of change (Prochaska & DiClemente, 1982). We focused this study on the heuristic five step model that outlines stages of change, paying particular attention to the first stage of change, precontemplation, a phase in which there is no recognition of need or interest to change. Other constructs in this theory such as decisional balance, self-efficacy, and processes of change, help in identifying factors preventing people, in this case in-service teachers, from changing their behavior with respect to their teaching practices.

Methodology

Data were collected from 81 teachers from three regions in the Northern, Eastern, and Ashanti regions of Ghana. Participants included agriculture teachers from schools which housed an onsite AgriCorps Fellows as well as non-agriculture teachers, headmasters/headmistresses, and Ghana 4-H staff. Pre and post training survey instruments were developed by AgriCorps Fellows. Given the uniqueness of the audience, we were only able to assess validity by use of a panel of local experts, and were unable to establish reliability measures. We did however, gather

reflections during the survey, and data from pre and post training surveys were summarized and analyzed using descriptive statistics.

Results/Findings

Table 1: Participants Value and Use of Concepts

Concept	*What concept did you find valuable? (%)*	*What concept(s) will you use in your classroom? (%)*
Role as an Educator[a]	63	1
Experiential Learning	69	48
Engaging Students	68	40
Mini Lessons[b]	26	0
Problem Based Learning[b]	54	16
Classroom Management	65	38
Planning a lesson	49	11

[a]Role as an Educator session did not include specific strategies to implement in the classroom, but rather was a session devoted to understand the purpose of teaching and the role a teacher plays in shaping a pupil's development.
[b]Session 4 (Mini Lessons) and session 5 (Problem Based Learning) were not taught at the Pong-Tamale training.

Conclusions/Implications/Recommendations

We were excited to see that participants found value in all of the concepts presented during the three-day training, with sessions on the experiential learning cycle, how to engage students, and classroom management as the most favored concepts. All participants indicated they would implement at least one of the concepts learned into their classroom and gave the training an average rating of 9.5 out of 10. Post training surveys indicated all participants could explain what experiential learning and teaching were as well as describe classroom management strategies that did not include corporal punishment. All participants noted they found the training useful and would recommend it to other teachers. Several participants noted they would like to have additional training on topics including but not limited to: how to build positive relationships with students, how to incorporate technology into the classroom, how to plan a lesson, how to better prepare teaching and learning materials, and how to motivate girls to be interested in science. These responses align with prior literature addressing the need for increased professional development opportunities for in-service teachers.

Upon conclusion of the training, AgriCorps Fellows worked with their agriculture teacher participant counter-part to implement strategies presented at the trainings. Researchers also created online group texting forums through the WhatsApp application to check in with participants after the training to offer assistance and further teaching ideas. We recommend continued research to assess the short and long-term effectives of this type of training.

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Metal Fabrication Knowledge Needed by Beginning Agriculture Education Teachers

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Metal Fabrication Knowledge Needed by Beginning Agriculture Education Teachers

Introduction/Need for Research

The importance of agricultural mechanics to school-based agricultural education programs has been well documented (Burris, Robinson, & Terry, 2005) and continues to be popular among secondary agriculture students (Hubert & Leising, 2000; Oklahoma Department of Career and Technology Education (ODCTE, 2012). Counterintuitively, however, teacher preparation programs require relatively few credit hours of agriculture mechanics for graduation. The majority of agricultural teacher preparation programs require fewer than 12 credit hours for graduation (Burris et al., 2005). While increasing the credit hour requirements may not be an option to better prepare agriculture teachers (Blackburn, Robinson, & Field, 2015), identifying the needs of teachers may provide a guide teacher education programs can reference to structure their course offerings to maximize instruction in agricultural mechanics. Therefore, the objective of this study was to identify the metal fabrication knowledge needed by beginning agriculture education teachers.

Conceptual Framework

The conceptual framework guiding this study was modeled after Buriak and Shinn (1989) who employed the Delphi method to identify a research agenda for agricultural education through the insights of content experts. Creating consensus among experts to identify teacher needs is a common use of the Delphi method (Stackman, 1974). The opinions of experts are used in the absence of a knowledge base to make decisions (Helmer, 1966).

Methodology

The Delphi method is reliant upon the selection of an expert panel (Dalkey, 1969). For this study, agricultural education faculty who taught metal fabrication courses at the post-secondary level were selected to participate as panelists. The identified faculty were sent an email request to participate. Of the 28 instructors invited to participate, 13 accepted and returned the initial instrument. Thirteen completed the second and third round questionnaires. When Delphi studies include groups of 13 or larger, reliability is greater than .80 (Dalkey, 1969).

In the first round, the panelists offered their response to one open-ended question. The question reflected the objective of the study, and remained unchanged throughout. In the second round, the panelists reviewed the responses from round one and assigned a value rating based upon the level of agreement with the item. A seven-point Likert-type scale was employed with items ranging from 1 “Very Strongly Disagree” to 7 “Very Strongly Agree”. Panelists were encouraged to further refine statements by adding comments and suggestions. Round three was used to further refine statements and build consensus among the panelists. Frequency distributions were used to refine further responses from round two. A 66% consensus level was established for this phase *a priori*. Only those statements on which 66% of the panelists selected “Strongly Agree” (rating of 6), and “Very Strongly Agree” (rating of 7) were retained for the third round. Descriptive statistics were used to summarize the collected data. Means, frequency distributions, and percentages were calculated for the statements on the third-round instrument.

Findings

Panelists identified 12 areas of metal fabrication knowledge required by beginning agriculture education teachers. The responses were consolidated into three categories, 1) metal fabrication equipment, 2) metal fabrication production, and 3) teaching and management. Within the metal fabrication equipment category panelists indicated beginning teachers need to be able to identify parts and components and operating procedures of welding and cutting equipment including SMAW, GMAW, and Oxy-fuel. In addition, teachers need to demonstrate understanding of the proper use of power and hand tools used in metal fabrication. Metal fabrication production knowledge included the ability to distinguish weld joints, welding positions, and create project bills of materials. Creating authentic performance assessments and implementing laboratory management plans including safety, first-aid, ordering materials, and equipment maintenance were areas of knowledge identified in the teaching and management category.

Conclusions

A panel of experts identified eight essential metal fabrication knowledge areas that beginning agriculture education teachers should possess prior to starting a career as a school-based agriculture educator. These knowledge areas ranged from knowledge of metal fabrication equipment and production practices to teaching and laboratory management.

As a result of this study, several questions arose: Are preservice institutions preparing prospective agriculture teachers with the needed metal fabrication knowledge areas to successfully gain employment? If the answer to this question is no, why are teacher educators not adequately preparing these students? Is the drawdown in credit hour requirements for graduation impacting this issue? If so, what professional development workshops are being provided to in the area of metal fabrication for current agriculture teachers? Furthermore, as we assess the viability of metal fabrication education in the agricultural mechanics laboratory are incorporating the technology and techniques used by modern professional metal fabricators? Future research will be necessary to answer these questions.

Recommendations

Based upon the results of this study, several recommendations were developed. Institutions which prepare preservice agriculture teachers should use the findings from this study to determine if students are being adequately educated in metal fabrication. Teacher educators and state professional development staff should conduct professional development needs of current agriculture teachers in the area of metal fabrication. Using findings from the previously suggested research, teacher educators and state professional development staff should develop and provide educational opportunities for teachers to increase their capacity to provide competent instruction in metal fabrication. Finally, to further improve metal fabrication instruction to preservice and inservice teachers, advisory groups consisting of industry professionals should be created and utilized to review curriculum to determine what improvements can be made to improve metal fabrication instruction to better reflect industry standards.

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Perceptions of a First Year Experience with the Agriculture Courses for Dual-Credit Initiative

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Introduction

The global economy demands a more educated workforce which directly depends upon high school graduation rates and successful career preparation (Brandon, 2009). Only sixty percent of college students earn a Bachelor's degree at a four year institution within six years (Nat. Center for Ed Stats, 2016). More specifically, there is a documented shortage of qualified graduates for agriculture jobs (USDA, 2015). One recognized method to increase student graduation rates is through dual credit courses (Adelman, 2006; Swanson, 2008). Dual credit frequently occurs between public schools and community colleges with the focus on core curriculum courses. However, previous dual credit programs in agricultural sciences have demonstrated that such institutional linkages are promising and that the dual credit model offers a practical solution for expanding the availability of university courses to all populations, including urban and underserved students. As a result, TAMU Commerce developed and assessed a new curricular model and instructional strategies for delivering a dual credit course in agricultural sciences.

Literature Review and Theoretical Framework

Dual credit courses stem from agreements between high schools, universities and community colleges whereby a high school junior or senior enrolls in a college course and simultaneously earns college credit and high school credit for the course (Radunzel, Noble & Wheeler, 2014). Stuhl and Vargas (2012) found that dual credit students were nearly 50% more likely to earn a college degree from a Texas college within six years than non- dual credit students. Additionally, dual credit students were significantly more likely to attend and persist in college to complete an Associate's degree or higher within six years. Momentum to completion was found as an important factor in a student's quest for a college degree based on the indicators of 20 credits completed at end of the first year, enrolling in college immediately after high school, and having earned college credit (Adelman, 2006; Swanson, 2008). The theory of planned behavior (TPB) states that a person's behavior is determined by their intention to perform a given behavior, as it can be predictable, deliberative and planned (Ajzen, 1991). The theory assumes human action is guided by three considerations: behavioral beliefs, normative beliefs, and control beliefs. These considerations are useful for assessing people's attitudes, norms and behavioral intention. The theory has application to educational settings, particularly in the area of dual-credit programs where knowledge is being disseminated to produce behavioral change.

Purpose and Objectives

The goal of this research was to strengthen partnerships with secondary schools by providing collaboration with university faculty in the delivery of an online animal science course for dual credit. The objectives were: (1) To assess student perceptions of the dual credit course, (2) To assess perceptions of secondary agriculture teachers who facilitated the dual credit course, and (3) To assess participants' perceptions of a summer workshop regarding its effectiveness in preparing them to teach or facilitate future dual credit courses.

Methods and Procedures

The population for this study was secondary schools in Texas that offer instruction within the discipline of agricultural sciences. The assessments focused on the delivery of an online animal science course in collaboration with secondary schools for dual credit in spring 2016. Schools, students, and teachers were recruited based on location, diverse student demographics, interest in dual credit courses, and programs that offer agricultural courses. Thus, the sample for the three assessments included secondary students (N=16) enrolled in the animal science dual credit

course, secondary teachers (N=3) facilitating the animal science dual credit course, and secondary teachers (N=6) who participated in the summer professional development for dual-credit institute. A post-test survey methodology was utilized. Surveys were designed via SurveyMonkey™ and questions were derived from previous literature on dual credit courses and programs, as well as Texas initiatives and legislation (Adelman, 2006; OFI, 2010; Radunzel, J., Noble, J. & Wheeler, S., 2014; Stuhl and Vargas, 2012; Swanson, 2008). Data collection procedures outlined by Dillman, Smyth, and Christian (2009) were followed for survey implementation. The final response rate for the student survey was 87.5% (n=14); 66.6% (n=2) for cooperating instructors; and 100% (n=6) for summer workshop participants. Descriptive statistics, means, frequencies, and percentages were analyzed using Excel.

Results

Of the 14 student respondents, seven (50%) lived on a farm, nine (64%) had been in FFA, one had been in 4-H, and 10 (71%) had animals at home with the most common being horses, cattle, chickens, and dogs. All enrolled students had a GPA over 3.0. Twenty eight percent (n=4) had taken an online course before, while 50% (n=7) had taken a dual credit course previously with the most common being English. The majority of students said their motivation for taking the course was to gain college credit. Fifty seven percent (n=8) stated they anticipated enrolling in a two or four year university immediately after high school. Cooperating instructors (n=2) previously taught one or two dual credit courses. Both instructors strongly agreed that dual credit students participated in rigorous learning, developed realistic expectations for post-secondary coursework, increased the likelihood to pursue post-secondary education, developed a better understanding of their academic skills, and raised their post-secondary educational aspirations. All six workshop participants overwhelmingly reported the summer institute improved their preparedness to teach online courses, developed new ideas about how to teach in their academic discipline, learned new online teaching skills, benefitted from peer and university support, gained a better understanding of expectations of college faculty for online students, established higher standards for student work, and were energized as a teacher. Fifty percent (n=3) of workshop participants indicated that they planned to facilitate or teach future dual credit courses.

Conclusions and Recommendations

This study was limited by its sample size; thus, findings should not extrapolate beyond the population. However, information gained from this first year study was useful to further develop the initiative in the future. Project design fostered collaboration and involvement at the secondary level with key university faculty, thus building a stronger connection for recruitment and retention of agricultural students. The theory of planned behavior (Ajzen, 1991) was useful to assess students' beliefs, influences, and self-efficacy relating to dual credit coursework and how this connected to their intentional behavior of enrolling in post-secondary education. Students were motivated by gaining college credit, as supported by previous research, and should be a priority message when recruiting for future dual credit programs. Universities should take advantage of this trend by offering a variety of agricultural dual credit courses to secondary students. Yet, in order to teach and facilitate dual credit courses, instructors must be prepared to do so with structured professional development opportunities as highlighted in the findings. Expansion of the dual credit model to include other courses in agricultural and food sciences is anticipated as well as the increase in the number of secondary programs wanting to offer dual credit.

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Predicting Consumers' Likelihood to Scan QR Codes to Identify Bioengineered Food Ingredients

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Predicting Consumers' Likelihood to Scan QR Codes to Identify Bioengineered Food Ingredients

Introduction/Need for Research

President Barack Obama signed the National Bioengineered Food Disclosure Standard on July 29, 2016, which defined bioengineered food as any food that "contains genetic material that has been modified through in vitro recombinant deoxyribonucleic acid (DNA) techniques and for which the modification could not otherwise be obtained through conventional breeding or found in nature" (p. 1). This law has altered the way the food industry communicates with consumers, creating a challenge for how manufacturers display their food labels on packages while providing access to additional information through a website link, telephone number, or a Quick Response (QR) code (National Bioengineered Food Disclosure Standard, 2016). Given the increasing importance of mobile devices and especially of QR code, it is important to understand how consumers would react to the entry of such technology in their grocery shopping habits, in accordance to Research Priority Area Two of the National Research Agenda (Roberts, Harder, & Brashears, 2016). This study's purpose was to discover consumers' use of disclosure methods and their purchasing intention of bioengineered food. The objective addressed in this manuscript was to predict consumers' intention to use their smartphone's QR code reader to learn whether a product contains bioengineered food ingredients based on their attitude, trust, smartphone and QR code experience, and demographic characteristics.

Theoretical Framework

Rogers' diffusion of innovation theory was the theoretical framework for this study. Diffusion seeks to explain how a new product is adopted, and five factors impact the diffusion process and the rate of adoption: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). This study focused on the characteristic of compatibility as it pertains to the degree to which using QR codes fit with consumers' existing values, past experiences, and needs. Consumers trust consumer organizations, environmental groups, and scientists more than government and industry as information sources for guidance when making decisions related to bioengineered food (Bredahl, Grunert, & Frewer, 1998; Gaskell, Allum, & Stares, 2003; Hunt & Frewer, 2001). From survey results of 800 general election voters, fewer than 1-in-4 respondents have ever scanned a QR code or bar code for learning about a food product (The Mellman Group, Inc., 2015). Sixteen percent of respondents who are the primary shopper in their household have scanned a QR code to get information. A survey of 525 U.S. adults indicated that 21.3% of respondents were very likely and 32.3% were somewhat likely to scan QR codes with their smartphones to determine if ingredients were bioengineered (Berning & Roe, 2017).

Methods

An online survey was created, reviewed by a panel of experts, and used to collect data. SurveyMonkey disseminated the survey using a non-probability opt-in sampling technique to 523 U.S. residents 18 and older (Baker et al., 2013). Four hundred fifty-six responses were usable, yielding an 87% response rate. The data were weighted according to the 2010 U.S. Census to increase generalizability of the study's results (Baker et al., 2013). The questionnaire addressed respondents' attitude toward GM food, level of trust for sources from which they got information about bioengineered food, likelihood to use disclosure methods to learn whether

products contain bioengineered ingredients, smartphone and QR code experience, and demographic characteristics. The ordinal logistic regression was run using SPSS.

Results

A proportional-odds cumulative ordinal logistic regression was calculated to determine the effect of attitude toward bioengineered food, trust of information sources, age, gender, past behavior of using a QR code on food products, ability to make phone calls at grocery stores, and access to the internet on smartphone at grocery stores on the likelihood to use their smartphone to scan QR codes to access information about bioengineered ingredients in food products. The analysis resulted in a statistically significant model, predicting the dependent variable over and above the intercept-only model, $\chi^2(17) = 102.797$, $p < .001$. Thirteen variables in the final model accounted for 21.9% of the variance, with five of those variables being significant predictors (see Table 1).

Table 1
Ordinal Logistic Regression Predicting Consumers' Use of Smartphone QR Code Reader to Access Bioengineered Ingredient Information on Food Products

Predictor	*ß*	*SE*	*OR*	*95%CI*	*Wald test*	*p*
Access to Wireless Internet	-1.352	0.30	0.259	[.145, .462]	20.926	.000
Ability to Make Phone Call	0.047	0.42	0.047	[.456, 2.409]	0.012	.911
Previous Use of QR Code Reader	-0.976	0.21	0.377	[.251, .566]	22.179	.000
Gender	0.060	0.19	1.062	[.733, 1.539]	0.102	.750
Age	-0.004	0.01	0.996	[.985, 1.006]	0.600	.439
Scientists	0.499	0.26	1.648	[.991, 2.739]	3.712	.050
Food Manufacturers	0.113	0.22	1.119	[.721, 1.737]	0.253	.615
Consumer Groups	-0.681	0.24	0.506	[.316, .810]	8.034	.005
Environmental Groups	0.010	0.22	1.010	[.653, 1.562]	0.002	.963
Health Professionals	-0.073	0.27	0.929	[.549, 1.574]	0.074	.929
Regulatory Agencies	0.162	0.21	1.176	[.787, 1.758]	0.626	.429
Farmers	0.351	0.20	1.421	[.957, 2.110]	3.037	.081
Attitude	-0.239	0.06	0.787	[.696, .890]	14.512	.000

Note. CI = confidence interval for odds ratio (OR)

Conclusions/Recommendations/Implications

Access to wireless internet, ability to make calls on their smartphones, trust, attitude, certain information sources, age, and gender accounted for 21.9% of the variance. Attitude towards bioengineered products predicted likelihood to use the QR code app on a smartphone, which was expected since attitude has influenced interest in and purchase of bioengineered food. It was not surprising that regulatory agencies and food manufacturers were not significant predictors since government agencies and industry are least trusted. This research provides a customer profile from which agricultural communicators can use to provide biotechnology and nutritional information beyond an on-package food label, offering better transparency and communication between consumers and agri-food manufacturers. Additional research should measure consumers' reactions to the types and amounts of information sought and received since the U.S. Secretary of Agriculture has to determine the language and symbols used in any disclosure.

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Predicting Farmers' Involvement in Farm to School Programming

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Predicting Farmers' Involvement in Farm to School Programming

Introduction/Need for Research

The U.S. Department of Agriculture Farm to School Census (2015) reported that 35% of school districts in [state] participated in farm to school (FTS) programming, accounting for 349 schools and 220,881 students. Despite the number of schools participating, few studies have sought to examine the perspectives of primary stakeholders, such as farmers, in FTS programming (Izumi, Wright, & Hamm, 2010; Joshi, Azuma, & Feenstra, 2008). Lack of literature on the role of farmers in FTS programming presents a problem for stakeholders interested in program creation and success; this problem aligns with Research Priority Area Two of the National Research Agenda (Roberts, Harder, & Brashears, 2016). Without understanding the roles of all stakeholders involved in FTS programming, the relationships between groups such as farmers and food service directors may not occur and involvement in FTS programs may not increase (Izumi, Alaimo, & Hamm, 2010). Survey results provided information to the [state] State Board of Education's Farm to Fork task force on how to increase the amount of locally sourced products in school systems, expand educational activities in the classroom, and establish more school gardens. The purpose of this study was to describe respondents' role in FTS programming and their interest in institutional marketing of local foods. The research objective addressed in this manuscript was to describe the relationship between respondents' attitude, subjective norms, and perceived behavioral control in predicting intentions to participate in farm to school programming.

Theoretical Framework

The theory of planned behavior was the theoretical framework for this study. Three factors (attitude, subjective norms, and perceived behavioral control) interact with one another to form intent, eventually leading to the behavioral outcome in question (Ajzen, 1991). Attitude represents an individual's summary evaluation of psychological concepts or objects described in such paradigms as good-bad or harmful-beneficial, forming a positive or negative attitude toward the behavior (Ajzen, 1991). Subjective norms are described as the perceived social pressures influencing individuals to act on a behavior one way or another (Ajzen, 1991). Perceived behavioral control (PBC) is described as an individual's perceived ease or difficulty in taking part in a specific behavior (Ajzen, 1991). PBC is associated with experiences and the expected complications of performing a new behavior (Ajzen, 1991). Although described as an attribute contributing to the formation of intention, PBC also plays a key role in affecting behavior directly (Ajzen, 1991). Behavioral intention is an individual's perception of the ease of performing the behavior in question (Fielding et al., 2008). A general assumption regarding the theory is that the more favorable the attitudes and subjective norms are in relation to a behavior, and the higher PBC, the chances that the individual engages in the behavior becomes greater.

Methodology

This study utilized descriptive explanatory research. Online survey research methods were implemented to gather information to describe respondents' attitudes toward FTS, subjective norms that influence respondents' participation in FTS programming, participation in FTS activities, perceived behavioral control toward FTS participation, and intention to participate in FTS programming. The population examined in this study was farmers who belonged to the [State] Farm Bureau (N = 5,470). The questionnaire was developed by the researchers with some

questions being modeled after FTS programming studies by Conner et al. (2012), Erpelding, Pinard, and Yaroch (2011), and Izumi et al. (2010). Survey data collection methods followed Dillman's (2011) *Tailored Designed Method*. A panel of experts with knowledge in survey methodology or FTS programming established content and face validity. Non-response error was addressed by comparing early respondents to late respondents on key demographic variables, identifying no statistically significant differences between the two groups. One-hundred and forty-three respondents participated in the study.

Results

Multiple linear regression examined the ability of attitude, subjective norms, and perceived behavioral control to predict farmers' intention to participate in FTS programming. The regression model was significant and indicated good fit, with $F = 29.60$, $p < .001$. The three variables accounted for 67.2% of the variance in influence on the intention of respondents to participate in FTS programming (Adjusted $R^2 = 46.0\%$). Table 1 showed that the subjective norm variable significantly predicted the intention of respondents to participate in FTS programming, $t(112) = 6.12$, $p < .001$. The perceived behavioral control variable also significantly predicted the intention of respondents to participate in FTS programming, $t(112) = 4.61$, $p < .001$. The positive beta values of 0.518 and 0.400 revealed that as the influence of subjective norms and perceived behavioral control increased, so did intention to participate in FTS programming.

Table 1. *Multiple Regression Analysis for TPB Variables Predicting Intention to Participate in FTS Programming*

Variable	*B*	*SE B*	*95%CI*	*B*	*t*	*p*
Constant	- 0.071	0.379	[-0.82, 0.68]		-0.186	.852
Attitude	0.071	0.053	[-0.03, -0.18]	.09	1.347	.181
Subjective Norms	0.518	0.085	[0.35, 0.69]	.46	6.117	.000
Perceived Behavioral Control	0.400	0.087	[0.23, 0.57]	.35	4.613	.000

Note. $R^2 = .45$ ($n = 113$, $p < .001$). CI = confidence interval for *B*.

Conclusions/Recommendations/Implications

Attitude, subjective norms, and perceived behavioral control accounted for 67.2% of the variance in intention to participate in FTS programming. These findings suggest other factors contribute to intention to participate in FTS programming. Researchers could investigate other groups of farmers to determine if these components of the theory of planned behavior successfully influence their intention to participate in FTS programming. Researchers should further explore the attitudinal component of the theory of planned behavior to determine if it successfully influences intention to participate in other groups of farmers. Additional factors, such as demographics, knowledge, past involvement, benefits, and barriers should be independent variables analyzed with multiple regression to better predict farmers' intention to participate in FTS programming. Agricultural communicators and Extension professionals have a better understanding of who to work with and how to communicate with farmers interested in FTS programming. With these TPB factors known, it could be easier for Extension professionals to more easily communicate about FTS programming and provide training and resources needed to assist farmers in selling locally grown products and participate in farm to school activities.

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Professional Characteristics of Teacher Certification Program Graduates

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Professional Characteristics of Teacher Certification Program Graduates

Teacher shortage, especially in agricultural education, has been a major issue for over 40 years (Kantrovich, 2007). The high rate of attrition from burnout, retirement, and self-efficacy has been studied for years, yet the numbers of agricultural programs closing and unfilled teaching positions have still increased. The increase in attrition is a result in a shortage of teachers. Therefore, quality teachers are in high demand. With education being an ever-changing field, it is important for teacher preparation programs to keep up with the changes that are made. The curriculum teachers experience during their preparation can affect their teaching career. It is critical to implement courses that prepare pre-service teachers to enter the profession of teaching.

Additionally, preparing students to perform on certification exams, validating their preparation to teach an ever-widening list of technical subject areas, adds to the challenges in teacher preparation programs. In Texas, recent changes in the secondary curriculum, state certification exam, and standards for beginning teachers has led Texas Tech Univerity to reform their curriculum in order to prepare their students. These changes have resulted in a need to assess the level of preparation of program graduates completing the program. Are Texas Tech University Agricultural Education Teacher Certification program graduates prepared to be entry-level agricultural science teachers?

The decision to enter the teaching profession, and the subsequent decision to stay or leave the profession, is largely dependent on one's self perceived ability to perform the job-related duties (McKim & Velez, 2016). Self-efficacy is defined by Bandura (1994) as an individual's belief in their ability to perform a task or achieve an outcome. The four sources of influence that suggest a strong sense of self-efficacy are: mastery experience, vicarious experiences, social persuasion, and physiological and emotional state (Bandura, 1997).

The purpose of this study was to describe the professional attributes associated with the program graduates of Texas Tech University Agricultural Education teacher certification program graduates. A quantitative descriptive research design was used to accomplish this objective. The target population was comprised of teacher certification graduates reflecting the change in program design. These graduates were from the years of 2012-2017. The data collected were part of a larger program evaluation and reflect the information from one section of a researcher developed instrument. A total of 78 program graduates were identified for this study. Data were collected from 59 program graduates ($N = 59$), resulting in a total response rate of 75.6%.

To describe the personal teaching demographics of the participants ($N = 59$), the following variables were used: gender, year of graduation, current teaching status, currently teaching agricultural science, number of schools taught in, number of teachers in agricultural program they work in and pathways currently teaching. There were double the number of female ($n = 40$, 67.8%) that participated in the study than male ($n = 17$, 28.8%).

Table 1 depicts the frequencies and percentages of the program graduates teaching status. An average of 50% ($n = 29$) of the program graduates were *currently teaching*. There were 37.9% ($n = 22$) that were *not currently teaching* and 12.1% ($n = 7$) that responded with *I have never taught*. Of the 50% ($n = 29$) that are teaching, 86.2% ($n = 25$) are currently teaching agricultural science. That allows for 13.8% ($n = 4$) of those teaching to be teaching in other disciplines. Of the program graduates that are currently teaching agricultural science ($n = 25$), over half of them have only taught in one school. The agricultural science pathway taught by the current agriculture teachers. The two most frequently taught pathways by the program graduates

were *Animal Science* (*n* = 16, 64.0%) and *Plant Science* (*n* = 10, 40.0%). *Natural Resources* (*n* = 3, 12.0%) and *Environmental Service Systems* (*n* = 2, 8.0%) were least frequently identified. The size of the agricultural programs the participants taught in varied from one teacher departments to five teacher departments. There were 10 (40.0%) participants teaching in a two teacher program, while there was only 1 (4.0%) teaching in a five teacher program.

Table 1
Personal Attributes of the Program Graduates (*N* = 59)

Characteristic	*f*	%
Currently Teaching		
Yes	29	50.0
Not currently	22	37.9
I have never taught	7	12.1
Currently Teaching Ag Science		
Yes	25	86.2
No	4	13.8
Number of Schools Taught At		
One	16	27.1
Two	6	10.2
Three	2	3.4
Number of Teachers in the Program		
One	4	16.0
Two	10	40.0
Three	6	24.0
Four	4	16.0
Five	1	4.0

Over half of the participants for this study were female. Likewise, over half were currently teaching. These findings align with other studies, such as, the study of the supply and demand in agricultural education for 2007, where Kantrovich found that only half of agricultural education teacher certification graduates were entering into the profession of teaching. Twenty-five of the participants currently teaching were teaching agricultural science. The three most popular taught pathways were *Animal Systems, Plant Systems and Power Structural* and *Technical Systems*. The least popular taught pathways were *Environmental Service Systems, Natural Resource Management* and *Agribusiness*.

These findings imply a significant number of program completers are not going into the field or they are not staying in the teaching field. Rice and Kitchel (2016) suggested part of the reason teachers could be struggling could be from lack of teacher preparation curriculum. It is important to consider the concerns or praises delivered by the program graduates. Eacute and Esteve (2000) stated the disagreements have been made on if teacher preparation programs are preparing preservice teachers adequately. Stair, Warner and Moore (2012) expressed "by identifying the concerns of pre-service teachers and early career teachers in the field, teacher educators can better determine appropriate course content and sequence coursework and in-service to better reflect the needs of these different groups" (p. 160). Teacher education programs should be continually evaluated to ensure they meet the constantly evolving professional demands of program graduates.

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Progression of Time Spent Observing, Preparing, and Teaching Throughout the Student Teaching Experience

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Progression of Time Spent Observing, Preparing, and Teaching Throughout the Student Teaching Experience

Introduction

Student teaching is the capstone experience in teacher preparation programs; it provides an opportunity for experiential learning in which student teachers take on the roles of a full time teacher (Krysher, Robinson, Montgomery, & Edwards, 2012). Paulsen, Smalley, and Retallick (2016) stated that there are many critical factors to the student teaching experience. Among these, university supervisors ranked planning for instruction and teaching as the most important activities. Cooperating teachers reported both teaching and planning for instruction to be among the most important factors of student teaching (Smalley, Retallick, & Paulsen, 2015a). It was also reported from the perspective of student teachers that planning for instruction was one of the most important activities in their student teaching experience (Smalley, et al., 2015b). Torres and Ulmer (2007) found that student teachers spent a combined majority of their time planning for instruction and teaching while they only spent a small amount of time observing other teachers. The purpose of this study was to determine the progression of time spent observing teachers, preparing for instruction, and teaching throughout the student teaching experience.

Conceptual Framework

There should be a logical progression of expectations through the student teaching experience. Wentz (2001) outlined three phases of student teaching: 1) orientation and observation, 2) assisting, and 3) assuming responsibility in the total school program. Wentz (2001) stated that student teachers should observe their cooperating teacher for at least the first week of their experience, then move onto assisting students individually or in small-groups. Once student teachers have progressed through the first two stages, they should increase their workload throughout the experience until they assume the full role of the teacher (Wentz, 2001).

It is important to determine how student teachers are allocating their time during the student teaching experience (Torres & Ulmer, 2007). Torres and Ulmer (2007) found that student teachers initially spent a majority of their time observing other teachers, but that amount of time rapidly decreased through the conclusion of the student teaching experience. While it was stated that there should be a consistent rate of planning for instruction through the experience, it was reported that time spent planning started out high and decreased through the end of student teaching (Torres & Ulmer, 2007). Finally, as time spent observing decreased, the amount of hours spent teaching increased with the exception of the final weeks of the student teaching experience when the hours spent teaching decreased (Torres & Ulmer, 2007).

Methods

The population of this study was made up of the student teachers from the cohort at Texas Tech University ($N = 15$). Student teachers were required to submit reports to their university supervisors for each week of their student teaching experience. Using a document based off of Torres and Ulmer (2007), student teachers reported the number of hours they spent each week in thirteen different categories. For the purpose of this study, researchers chose to focus on the following three categories: 1) Observing Cooperating Teacher, 2) Preparation for Instruction, and 3) Classroom and Laboratory Teaching. The reported data from the 15-week student teaching experience was collapsed into five, 3-week time intervals and compiled into an

Excel spreadsheet. Means and standard deviations were calculated for each time interval using functions in Excel.

Results/Findings

This study sought to determine the progression of time spent observing teachers, preparing for instruction, and teaching throughout the student teaching experience. Table 1 displays the averages in the three categories for each three-week interval of the student teaching experience. Time spent observing was highest in the first interval (M = 28.70, SD = 20.91) then decreased through the second (M = 17.57, SD = 12.25) and third (M = 12.60, SD = 10.63) intervals before increasing through the end of the student teaching experience.

There was an increase in the time spent preparing for instruction from the first interval (M = 11.10, SD = 7.92) to the second (M = 11.50, SD = 10.08) before a drop in the third interval (M = 9.60, SD = 6.90) and a peak in the fourth (M = 15.10, SD = 10.90). Finally, time spent preparing for instruction decreased in the fifth interval (M = 13.00, SD = 11.30).

The time student teachers spent teaching started out with the lowest number of hours in the first interval (M = 19.10, SD = 13.92) and increased in the second interval (M = 38.00, SD = 29.32). There was a decrease of hours spent teaching in the third interval (M = 24.30, SD = 17.02) before increasing through the remainder of the student teaching experience.

Table 1

Time Spent Observing, Preparing, and Teaching by Preservice Teachers (N = 15)

	Observing		Preparing		Teaching	
Interval	*M*	*SD*	*M*	*SD*	*M*	*SD*
1	28.70	20.91	11.10	7.92	19.10	13.92
2	17.57	12.25	11.50	10.08	38.00	29.32
3	12.60	10.63	9.60	6.90	24.30	17.02
4	12.77	14.63	15.10	10.90	32.40	22.30
5	15.47	14.73	13.00	11.30	40.30	19.44

Conclusions/Recommendation

The distribution of time spent observing by student teachers at Texas Tech University started out high then decreased through the conclusion of the student teaching experience until the slight increase through the final weeks of student teaching. This is consistent with the results of Torres and Ulmer (2007) with the exception of the increase in the final interval. Additionally, this cohort was consistent in the amount of time they spent planning for instruction as Torres and Ulmer (2007) suggested should happen.

Wentz (2001) outlined three phases of student teaching: 1) orientation and observation, 2) assisting, and 3) assuming responsibility in the total school program. The student teachers in this cohort followed these phases in the teaching aspect with the exception of the drop in hours spent teaching in the third time interval. This drop in hours spent teaching is potentially due to the timing of Career Development Events and livestock shows in Texas. It is recommended that the individuals involved in planning for the student teaching experience determine guidelines to ensure student teachers are receiving the practice they need during that time of year. Torres and Ulmer (2007) stated, there is a need for a "phase-out" period of student teaching. As student teachers reported spending the most time teaching in the final weeks of their experience, it is recommended that a plan for phasing out of the role of the teacher be outlined as an expectation.

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Range in Allocation of Time of Preservice Teachers During Their Field Experience

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Range in Allocation of Time of Preservice Teachers During Their Field Experience

Introduction

Student teaching is an impactful and culminating experience for preservice teachers that serves as the final component of teacher education programs (Edgar, Roberts, & Murphy, 2009). A significant time commitment is required to fulfill the many job responsibilities of agriculture teachers (Krysher, Robinson, & Edwards, 2015). The field experience portion of a preservice teacher's education provides them with a real-word understanding of the substantial time commitment associated with being an agriculture teacher. The relationship between the cooperating teacher, student teacher, and cooperating school are highly influential on the experience of preservice teachers (Shoulders, Edgar, & Bolton, 2016, Kasperbauer & Roberts, 2007). Cooperating teachers should be prepared to give student teachers opportunities that reflect a real-world experience (Jones, Kelsey, & Brown, 2014)

The purpose of this study was to describe the differences in time allotment to preservice teacher activities during the student teaching internship among members of a student teaching cohort. These activities included learning as a student, FFA advising, classroom instruction, administrative responsibilities, and adult education.

Theoretical Framework

Bandura's work on self-efficacy provides theoretical basis for this study. Over the course of the development of his theory, he identified four sources that contribute to a heightened sense of self efficacy: mastery experiences, social persuasion, vicarious experience, and physiological and emotional state (Bandura, 1977, 1986, 1997). According to Wolf (2011), it is essential that agricultural science teachers are competent in all areas in which they are asked to perform. Student teachers that spent more time in the classroom teaching identified themselves as "self-assured" teachers (Krysher, Robinson, & Edwards, 2015). Student teachers' perceptions of their field experience are positively linked to their sense of self-efficacy (Knobloch, 2006).

Methods

Fifteen students in the student teaching cohort at Texas Tech University submitted weekly reflections and reports that summarized time allocation. Students were provided a Microsoft Word template at the beginning of their student teaching experience based largely off of Torres and Ulmer's (2007) study on the time distribution of pre-service teachers. For each of the 15 weeks spent student teaching, the cohort utilized this template to report the number of hours spent in 13 areas to their university supervisor. In order to create a more comprehensive look at the differences of time allocation amongst preservice teachers, the researchers grouped each of the 13 reported areas into five encompassing categories of the student teaching experience: 1) Learning as a Student, 2) Serving as a Secondary Agriculture Instructor, 3) Administrative Duties, 4) FFA Advisor Duties, and 5) Adult Education. The students' self-reported hours were entered into a Microsoft Excel data sheet. Totals were calculated for hours spent in each of the 13 areas and the cumulative hours for each of the five general categories. Minimum and maximum scores were determined and ranges were calculated for the encompassing categories. Additionally, mean and standard deviation were calculated by utilizing the functions included in Microsoft Excel software. Processes discussed by Field (2014) were used to confirm scores.

Results

This study sought to describe the range in time allocation amongst preservice teachers in various areas of the student teaching experience. Student teachers dedicated most of their time to FFA advisor responsibilities. The time spent in this category ranged significantly, with a minimum of 92.5 hours invested to a maximum of 658.0 hours over the 15 week experience (*M* = 281.7, *SD* = 165.6). Activities associated with being a secondary agricultural science teacher were the second largest use of the student teacher's time (*M* = 271.1, *SD* = 126.2). There was a 431.5 hour difference between the highest and lowest number of hours invested in classroom instruction. On average, the cohort spent 130.5 hours (*SD* = 80.8) learning by observing and conferencing with their cooperating teachers. Preservice teachers spent the least amount of time participating in administrative duties (*M* = 21.7, *SD* = 39.1) and adult education (*M* = 8.8, *SD* = 17.9).

Table 1
Time Allocation of Preservice Teachers in General Categories (N = 15)

Activity	Minimum	Maximum	Range	*M*	*SD*
FFA Advisor Duties	92.5	658.0	565.5	281.7	165.6
Secondary Instructor	111.5	543.0	431.5	271.1	126.2
Learning as a Student	33.5	325.0	291.5	130.5	80.8
Administrative Duties	1.0	161.5	160.5	21.7	39.1
Adult Education	0.0	70.0	70.0	8.8	17.9

Conclusions and Recommendations

Individual student teachers are having significantly different field experiences in all aspects of agricultural education. While no two preservice teachers will have identical student teaching experiences, it is vital to ensure that student teachers are confident and qualified in all areas before they are certified. Krysher et al. (2015), found that students who identified themselves as "self-assured" spent more time teaching in the classroom setting. The inequity of hours dedicated to the aforementioned activities could result in a cohort of preservice teachers with varying levels of self-efficacy and confidence.

It is recommended that more thorough and detailed guidelines are established by teacher preparation programs regarding time commitment and allotment expectations. Prior to the beginning of the field experience, these expectations should be clearly communicated to the members of student teaching cohort. Additionally, a clear line of communication needs to be established with cooperating centers to help assure that student teachers are getting a well-rounded, complete experience and spending a sufficient number of hours completing the diverse job responsibilities of an agricultural science teacher. It is recommended that cooperating teachers are invited to a professional development training hosted by the university prior to the beginning of the field experience. This training should outline expectations for both the student teacher and cooperating center. During the student teacher placement process, teacher preparation programs should ensure that selected cooperating teachers will provide opportunities in all aspects of the agricultural education program. It is imperative that cooperating teachers are willing and prepared to involve their student teacher and allow them to be active program participants (Jones et al., 2014).

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Routes to Certification and Turnover Intentions of Early Career Wisconsin Agriculture Teachers

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Routes to Certification and Turnover Intentions of Early Career Wisconsin Agriculture Teachers

Introduction

Teacher education and preparation has evolved since its inception in the mid-19th century and has been impacted by foci in training, learning and policy (Cochran-Smith & Zeichner, 2005). To look at teacher preparation, it is imperative to understand the two main pathways to teacher certification – traditional (TC) and alternative (AC). The traditional route to teacher certification has the teacher entering the classroom after completing teacher preparation training through a university teacher preparation program with alternative routes being all the other options (National Research Council, 2010; Walsh & Jacobs, 2007).

Darling-Hammond and Sykes (2003) recommended there should be a focus on quality preparation and support, adequate pay and working conditions, and the likelihood of teachers succeeding in the workplace to keep teachers in the classroom. With the consistent shortage of agriculture teachers in agricultural education, researchers have focused on the attrition of teachers (Clark, Kelsey, & Brown, 2014; Lemons, Brashears, Burris, Meyers, & Price, 2015). Sorensen (2015) also explored specific reasons agricultural teachers may leave the classroom with a study focused in part on turnover intentions. A key variable to the supply and demand of agriculture teachers is ensuring the profession retains teachers, as Ingersoll (2001) noted that teacher turnover is a major factor in the demand of teachers.

Conceptual Framework

To guide this study, the authors used a conceptual framework of the relationship between teacher's personal and professional background from a report for the United States Department of Education entitled "An Evaluation of Teachers Trained Through Different Routes to Certification" (Constantine et al., 2009). With teacher preparation and turnover intention being identified as major variables in the literature review, they have been included in the proposed conceptual framework.

Methodology

This study utilized descriptive and correlational methods to examine the routes to certification and turnover intentions of Wisconsin agriculture teachers with fewer than three years of teaching agriculture. A survey instrument collected information in the spring of 2017 (n = 35). This group included individuals who went through a traditional route of teacher preparation (n = 25) and an alternative route (n = 10). The survey instrument included questions to identify demographic characteristics and examine routes to certification and turnover intentions. Data collection was completed by making four points of contacts with participants via email. The final response rate was 52% with 35 respondents out of the 67 agriculture teachers in the population.

Results

Research question number one focused on the demographic characteristics of respondents and sought to identify personal and teaching characteristics. Participants were between 22 to 55 years old with 71.40% being female. Regarding racial and ethnic identity, 97.10% of respondents identify as "White, European American, Non-Hispanic." Respondents had taught between 1 to 3 years with the majority of respondents teaching in a rural setting (71.30%). Those who taught in

a suburban setting represented 17.10% of the population and 8.60% taught in an urban setting. The 68.60% of respondents shared they have a full-time teaching assignment in agriculture. A second group of respondents (22.90%) had a full-time teaching assignment, but taught other content in addition to agriculture

The majority of respondents (71.4%) indicated they completed a traditional teacher preparation program as part of a bachelor's degree program. The rest of respondents were distributed across alternative certification programs. Eight respondents signified they had a previous teaching license in another area before adding an agriculture license.

Respondents selected all that applied from a list of statements about why they became a teacher. The majority of respondents (71.40%) noted that as an undergraduate they planned to be a teacher and took all necessary courses to become certified. A majority of the group chose a route to becoming a certified teacher that allowed them to work full-time (50%), based on a program that was conveniently located (40%), and that had required coursework and training which fit their schedule (40%). Overall, the respondents had moderately low turnover intentions (M = 2.95, SD = 1.13). A Mann-Whitney U test indicated there was not statistically significant difference between the routes to certification and turnover intentions of Wisconsin agriculture teachers with fewer than three years of experience teaching agriculture (U = 130.50, p = .843).

Conclusions

While the majority of teachers in the population were traditionally certified, alternative route teachers indicated drastically different reasons for choosing the specific route for a teaching license. Choosing a route which allowed individuals to work full-time, was conviently located, and complete coursework and training which fits their schedule resonates with literature (Robinson, 2010) on alternative certification and routes to teaching. To fill the need of agriculture teachers in local school districts, it is critical that the agricultural education profession does not discount alternative routes, especially the reasons why individuals choose them.

True to Sorensen's (2015) findings on turnover intentions, the respondents had moderately low turnover intention (M = 2.95, SD = 1.13), which also echoes other findings in agricultural education (Crutchfield, Ritz, & Burris, 2013). While the difference in turnover intentions was not statistically significant, it should be noted the respondents who were in the alternative route group had a slightly higher turnover intention than their traditional route counterparts. This study should be replicated on a larger scale to research if the route of teacher preparation impacts turnover intentions and what other factors lead to agriculture teachers exiting the profession.

Recommendations for further research

This study has provided several recommendations for further research. Additional research should be done on this population to identify reasons for adding an agriculture license and success in teaching agriculture. Research should be completed on how alternative route individuals are educated about agricultural education and the three-circle model. There are still questions on whether alternative route teachers are effective classroom teachers. Additional research should be completed on classroom teaching, as well as program management of alternative route teachers.

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Student safety education in Texas agricultural mechanics classrooms and laboratories: A student's perspective on safety education

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Student safety education in Texas agricultural mechanics classrooms and laboratories: A student's perspective on safety education

Introduction

Agricultural science classes can prepare students with the knowledge and experience to pursue a future in the agricultural industry. Shoulders and Myers (2012) noted that students can learn a number of traits and "skills through experiential learning" by participating in agricultural classes (p.124). These students learn traits or skills that are highly employable, but more importantly, learn how to safely perform them while working. Langley and Kitchel (2013) stated that "the agricultural mechanics laboratory provides a means for students to learn in a safe and controlled environment" (p. 261). Furthermore, performing a skill safely can prevent unnecessary accidents and lessen the risk the agricultural industry may convey to workers. When "incorporating occupational safety and health into vocational, career, and other technical training, the benefits are believed to include increased job/career knowledge, safer work behaviors, increased competence when dealing with high risk occupational situations, and reduced incidence of occupational injuries and illnesses" (Schulte, Stephenson, Okun, Palassis, & Biddle, 2005, p. 404).

The National Children's Center for Rural and Agricultural Health Safety Fact Sheet (2014) noted that more than 955,400 youth lived on farms in 2012 and almost half (49%) worked on the farm. In 2012, there were 258,800 non-resident youth who were hired in the agricultural industry, which was an increase from the 230,400 in 2009 (NCCRAHS, 2014). As a result, "young agricultural production workers were three times more likely to die on the job than their non-agricultural counterparts" (Hard, et al., 1993; Reed, Browning, Westneat, & Kidd, 2006, p. 314). Though the agricultural industry can be a very hazardous place to work, even more so for the youth of today, can the number of accidents can decrease with the impact of safety training education through agricultural science classes?

Conceptual/Theoretical Framework

Dahodwala, Khorajia, Champa, and Pirani (2009) noted that "pedagogy is the science and art of education. It ranges from the full development of the human being to skill acquisition. In correlation with those instructive strategies, the instructor's own philosophical beliefs of instruction are harbored and governed by the pupil's background knowledge and experience, situation, and environment, as well as learning goals set by the student and teacher" (p. 1). Pedagogy guided this study by understanding how agriculture teachers educate students concerning proper safety skills. Along with pedagogy, this study also utilized the Health Belief Model. The Health Belief Model (Rosenstock, 1974; Becker, Drachman, & Kirscht, 1974) is a psychological model that attempts to explain and predict health behaviors. This is done by focusing on the attitudes and beliefs of individuals. "In the case of agricultural safety, this dimension refers to the individual's perception of getting into an accident" (Anderson, Velez, Anderson, 2014, p.11).

Methodology

The purpose of this study was to measure and understand the impact of safety education on high school agricultural mechanics students taught by Texas agricultural science teachers.

1. What safety education have students received from their agricultural science teacher while enrolled in school-based agricultural mechanics courses in Texas?

2. Does safety education influence these student's decisions to wear Personal Protection Equipment while working at school, home, or at their work?

The population for this study were Texas agricultural mechanics students (N = 76) who participated in the 2016 Sam Houston State University Welding and Metal Fabrication contest. A survey was developed based upon a review of literature of safety education in public schools. A panel of experts (N = 5) reviewed the survey for face and content validity. A survey type questionnaire was used to gather information about the participants, their safety habits, and the perceptions students had on agricultural safety education. Due to no existing population being available for a pilot test, a post hoc analysis of reliability was conducted (Cronbach's alpha coefficient =.84). Data was analyzed based upon measures of central tendency using IBM SPSS Statistics 22.

Findings

The majority of the participants were: White (n = 54; 71.1%); Male (n = 71; 93.4%); in the 12th grade (n = 29; 38.2%); 17 years of age (n = 29; 38.7%), and attended a 3A size high school (n = 23; 31.5%). These students had an afterschool job (n = 53; 73.6 %) and used the skills learned in agricultural education courses in their current part-time position (n = 53; 80.3%). Results indicated that participants were required to take a safety exam (n = 68; 89.5%), pass with a 100% success rate (n = 52; 70.3%), and were required to wear safety glasses (n = 76; 100.0%). Furthermore, students (n = 69; 90.8%) also indicated that they would wear safety glasses even if not required. Almost a fifth (n = 14; 18.4%) of students received an injury while working in the agricultural mechanics laboratory that required treatment at school and 13.3% (n = 10) received injuries that required off-campus medical treatment.

Conclusions, Implications, & Recommendations

Participants were mainly 17 years of age males, who attended a 3 A size high school and were in the 12th grade. Additionally, the majority of respondents indicated they had a job and used safety education learned in school at their job. Additionally, most students indicated having received safety education across 31 competencies. Based upon the results of this study, several implicative questions arose: 1. How effective was the safety education of these students who are enrolled in the agricultural mechanics course at their school? 2. Did the safety perceptions of the students exist prior to enrolling in an agricultural mechanics course or did safety education influence the students? 3. What teaching methods were used to teach these safety topics to students in their agricultural mechanics courses? These questions and others are grounds for additional safety research within agricultural education. Due to high teacher turnover within agricultural education, researchers recommend teacher educators study, and if necessary, implement various methods to prepare novice teachers in the curriculum area of safety education to avoid student safety accidents and injury in agricultural education laboratories.

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Student Perceptions of a First Time Experience with Peer Teaching in a Meat Science Course

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Introduction and Need for Research

One of the many challenges facing instructors today is understanding how their chosen teaching methods impact student knowledge, success and retention of the subject matter. Research states students have preferred learning styles and will excel at a greater level if the instructor teaches as the students prefer to learn (Chew, 2016). However, for many instructors, this is not always feasible due to lack of resources, time, or pedagogical background. Estepp, Roberts and Carter (2012) reported that improving the learning of undergraduate students relies on the quality and type of teaching methods presented. Peer teaching has been found to improve student involvement, engagement, active learning, and leadership within and beyond the classroom experience (Estepp, Roberts & Carter, 2012). In this study, a Meat Science course previously taught using instructor lecture as the sole teaching strategy for 16 years examined student perceptions of implementing peer teaching in the classroom for the first time.

Conceptual Framework

Anderson (2016) stated, "Learners who are engaged, motivated, and willing to take responsibility for their learning will achieve more than learners who undertake a minimum amount of learning and do not engage with learning opportunities," (p. 53). Student-centered learning is one approach used to improve student engagement that focuses on work done outside of the classroom, group discussions, presentations, and peer teaching (Lehman, 2011; Stevenson & Harris, 2014; Wright, 2011). Through peer teaching, students are given the ability to share their knowledge of a topic and create an inclusive classroom atmosphere, as all must participate either in the audience or as the peer teacher. Estepp and Roberts (2011) found that decision making, problem solving, and leadership are critical for a student-centered approach. As a peer teacher, students are exposed to each of these concepts as they make decisions about how and what to teach. Stevenson and Harris (2014) stated that, "The deepest learning occurs in the absence of the instructor" (p. 103). The peer teaching method offers a way to engage each student as pillars for one another's learning. To become a mini-expert, students must research extensively on their topic and thus, learn more about it (Johnson, et al., 2016). This approach provides students a stage for engagement. The "teachers" are engaged during the lesson as they present and the audience is more likely to remain attentive while listening to their peers (Courneya, Pratt, & Collins, 2008).

Purpose and Objectives

This study aligned with the AAAE National Research Agenda Research Priority 4: Meaningful, Engaged Learning in All Environments. The purpose of the study was to assess students' perspectives regarding the implementation of peer teaching in a Meat Science course at Montana State University in the spring of 2017. The objectives were: 1.) Describe students' academic rank, major, and learning styles 2.) Describe the students' knowledge change using peer teaching, 3.) Describe students' perceptions of peer teaching, and 4.) Compare differences in student quiz performance using peer teaching to years that did not utilize peer teaching.

Methodology

The sample was students (N=33) in a Meat Science course in the spring of 2017. An outline of expectations for a 10 minute peer teaching session was provided to students on the first day of class as they were randomly assigned a topic to teach. Peer teaching sessions were taught over a 4 week period. Survey methodology was utilized as students received two questionnaires. Learning styles were assessed at the beginning of the semester using the VARK survey (Fleming, 2012) to examine any differences in perceptions towards peer teaching. Successive information relating to peer teaching was gathered through a post-pre questionnaire to gain a

more accurate measure of knowledge (Taylor-Powell & Renner, 2000). The post-pre questionnaire was administered after all peer teaching topics were completed and asked students to rate their level of knowledge before and after peer teaching, positive and negative perceptions of the experience, and retention of information. All data was entered into Excel and analyzed using descriptive statistics. Content analysis was conducted on written answers which included coding of similarities and differences into themes (Hsieh & Shannon, 2005).

Results

Usable data was provided by 31 students for a response rate of 93.94%. Students ranged from one sophomore, eight juniors (26%) and 22 seniors (71%). The dominant major represented was Animal Science (n=28). Seven students identified as visual learners, 19 as kinesthetic, and four were mixed visual or auditory learners. Before peer teaching, the majority of students "sometimes" understood the topics. After peer teaching, the majority of students "often understood" the topics. Students expressed several common themes about improvements for peer teaching including more teaching time, handouts, access to slides, a better outline of teaching expectations, and different topics to teach. Five (16%) students believed no changes were needed and one student thought the instructor should teach. Finally, quiz scores from 2011- 2017 were compared on similar topics (Table 1). The overall course grade was not examined because it included several different topics beyond those in the peer teaching sessions.

Year	# of Students	High Quiz Score	Low Quiz Score	Quiz Average
2011	26	93.33	13.33	50.06
2012	27	103.33	10.00	60.58
2013*	28	116.67	38.33	83.45
2014	28	106.67	20.00	57.92
2015	31	101.67	20.00	59.66
2016*	34	123.33	58.33	85.71
2017	33	111.67	26.67	68.97

*Table 1: Students quiz scores in the Meat Science course from 2011-2017. * Denotes years when group quizzes were given.*

Conclusions, Recommendations, and Implications

Sixty-one percent of the students identified as kinesthetic learners (Fleming, 2012). Therefore, it is important for teaching strategies to include hands-on learning, touching, and manipulation activities for engagement. Based on the post-pre questionnaire, seven of the 31 students improved knowledge in all topic areas after peer teaching and 27 students improved knowledge in greater than 50% of the topic areas. Next, all students reported they did enjoy some aspect of peer teaching whether it was researching information, listening to peers, teaching others, or simply a change in teaching format from the daily lecture. These results show that students were more involved and responsible for their learning supporting Anderson's (2016) findings. Students also offered ideas to foster better teaching and learning in the future such as interactive, visual and hands-on activities. Almost all students (n= 30) stated that they learned from listening to and leading peer teaching. Overall, peer teaching seems to have benefitted students in this class as the average quiz score in 2017 was higher than any of the previous years, except for those with group quizzes. Different ways of incorporating peer teaching deserves more research. Apart from simply lecturing to one another, perhaps peer teachers could provide flipped teaching, extended activities, research projects, and other ideas to incorporate various learning styles. Further research should include other colleges and classes, and a longitudinal study of this course to note differences or similarities as students and teaching strategies change.

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Success on an Agriculture Teacher State Certification Test Based on Demographics

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Success on an Agriculture Teacher State Certification Test Based on Demographics

Introduction/Need for Research

Most people in Agricultural Education agree that there is a teacher shortage in the profession. Some secondary programs have struggled to find a qualified or certified candidate, resulting in some program closures. Alternative certification has provided some relief to the applicant pool, but even hiring a traditionally certified teacher has not meant the individual was qualified to teach the vast array of disciplines within secondary Agricultural Education. One component of agriculture teacher certification in Texas requires a candidate to pass the Texas Examination of Educator Standards (TExES) in Agriculture, Food, and Natural Resources, 6-12. The exam has six domains: Foundations of Agricultural Education; Agribusiness & Economics; Plant & Soil Science; Animal Science; Agricultural Mechanics & Technology; and Natural Resources & Environmental Science. Candidates do not have to pass each domain but an overall score of 240 is required. This study was conducted to determine whether success on this exam, overall or by domain, can be predicted based on gender, major, transfer student status, transfer GPA, or overall GPA. If such predicators are available, teacher educator programs may be better able to prepare teacher candidates for success on the exam, and subsequently, success as an educator.

Conceptual Framework

Multiple studies have been conducted to predict success on certain certification exams in Texas. Chambers, Munday, Sienty, and Justice (1999) examined predictive effects of several variables on teacher candidate performance on the Professional Development components of the Examination for the Certification of Educators in Texas (ExCET), the forerunner to the TExES. Simonsson, Poelzer, and Zeng (2000) found that success on the ExCET for Hispanic students at universities in South Texas can be predicted reasonably well using several variables. Regarding a specific content area, Guillory (2012) studied educators for their preparedness to teach environmental science based on the content exam success. The interest of this study's researchers was in the TExES Agriculture, Food, and Natural Resources, and no research was found to have been conducted for this exam. Further interest was on different demographics than those examined in previous studies. Researchers also desired to understand how well their institution was preparing teacher candidates for success on the exam and in the profession.

Methodology

Test scores of students at Sam Houston State University taking the TExES AFNR, 6-12, from 2011 through 2016, were secured from reports sent to its College of Education by the State Board for Educator Certification of the Texas Education Agency. Reports included the gender, ethnicity, overall score, and score in the six aforementioned domains. Transfer hours, transfer GPA, overall GPA, and the major of each candidate were secured through the university's Office of Institutional Effectiveness. Multiple Linear Regressions (OLS) were conducted to assess the influence of demographic variables (after controlling for differences in majors) on the overall score and score in each domain. Transfer hours, transfer GPA, overall GPA, gender, and ethnicity (white; non-white) were the explanatory variables used in the regression analysis along with dummy variables for majors to account for the differences in majors.

Results/Findings

Regarding demographics, there were 107 white and 11 non-white student attempts on the exam, which included 34 males and 84 females. The average transfer GPA was 2.81, and the average overall GPA was 3.04. A transfer student was considered as one that had more than 30 transfer hours, and there were 62 such students. The results of the regression analysis showed that overall GPA significantly and positively influenced the overall score ($P<0.001$). A 0.25 points higher overall GPA increased the overall score on an average by 4.76 points. Scores on the Foundations of Agricultural Education ($p<0.001$), Agribusiness & Economics ($p=0.021$), Animal Science ($p=0.004$), and Natural Resources & Environmental Science ($p=0.010$) domains were also significantly influenced by the overall GPA of the student. An increase in student GPA by 0.25 points increased the scores on Foundations of Agricultural Education, Agribusiness & Economics, Animal Science, and Natural Resources & Environmental Science domains by 3.95, 4.49, 4.66, and 4.45 points, respectively. However, scores on the Plant & Soil Science and Agricultural Mechanics & Technology domains were not significantly associated with students' overall GPA. Males significantly outscored females in overall score (12.32 points) and in each domain: Foundations of Agricultural Education (5.32 points); Agribusiness & Economics (9.62 points); Plant & Soil Science (9.63 points); Animal Science (9.56 points); Agricultural Mechanics & Technology (11.73 points); and Natural Resources & Environmental Science (14.04 points). Ethnicity significantly influenced (at 10% alpha level) the scores only in the Agricultural Mechanics & Technology domain as white students scored 9.41 points higher than non-white students. The number of transfer hours and transfer GPA did not significantly influence the overall score and scores in any of the six domains.

Conclusions

This study showed that a student's overall GPA is the best predictor of performance on the certification exam. Male students performed considerably better than female students, especially in the Agricultural Mechanics & Technology and the Natural Resources & Environmental Science domains. Transfer hours and transfer GPA were not major factors influencing the success on the certification exam, meaning that students who transferred in with 30 or more hours, regardless of their transfer GPA, performed just as well as non-transfer students on each domain and overall. Ethnicity is not a factor in predicting success on most (5 out of 6) domains.

Implications/Recommendations/Impact on Profession

Given that there were only 11 attempts on the exam by non-white students, generalizing results based on ethnicity should be made with caution. And while a higher GPA tends to predict a higher likelihood of success on the exam, students with lower GPAs may need review sessions in advance of the exam. Females students can be encouraged to undergo stronger academic preparation in Agricultural Mechanics & Technology, as well as Natural Resources & Environmental Science, so that their chance of success in those domains can be increased. The exam was updated and changed in Fall 2016, including an added domain in Food Science & Processing, so this study should be duplicated in the future for possible changes in success.

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Supervised Agricultural Experience (SAE) Practices of Washington Agriculture Teachers

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Introduction and Conceptual Framework

The 2016-2020 National Research Agenda for the American Association for Agricultural Educators highlights Efficient and Effective Agricultural Education Programs as Priority 5 (Roberts, Harder, & Brashears, 2016). Effective agricultural education programs must incorporate all three components of the agricultural education program: classroom/laboratory instruction, FFA, and Supervised Agricultural Experience (SAE) (Phipps, Osborne, Dyer, and Ball, 2008). In a synthesis of SAE research Dyer and Osborne (1996) found the agriculture teacher's attitude and past experiences impact an agricultural education program's SAE quality. Research indicates teachers value SAEs but fail to completely implement this component (Dyer & Osborne, 1995; Retallick, 2010).

The conceptual framework of this study is rooted in the "teacher responsibilities" related to SAEs. These responsibilities include teaching students about SAEs, helping students plan a SAE program, and supervising SAEs (Phipps et. al, 2008). In order for students to earn FFA degrees and apply for proficiency awards students must keep accurate records of their SAE. Receiving degrees and awards is one avenue of recognition for students and can be used as a motivating factor to participate in SAEs. It has also been suggested that SAE planning involve all stake-holders and should result in the creation of both short-term and long-term goals (Phipps et. al, 2008). In order to understand the status and quality of SAEs in Washington this study sought to describe the teacher practices related to SAEs. Specifically the objectives of this study were:

1.) Describe instruction related to SAEs provided by Washington agriculture teachers.
2.) Describe SAE planning practices Washington agriculture teachers require of their students.
3.) Describe SAE supervision practices of Washington agriculture teachers.
4.) Describe SAE record keeping practices of Washington agriculture teachers.
5.) Describe ways Washington agriculture teachers encourage students to receive recognition for their SAE.

Methodology

A census survey of all 262 Washington agriculture teachers was attempted. A response rate of 42% was achieved. Qualtrics was used to distribute a researcher developed survey which was reviewed by a panel of experts for face and content validity. The Tailored Design Method was utilized in developing and conducting the survey (Dillman, Smyth, & Christian, 2009).

Results/Findings

Results for objective one showed seventy-three of Washington agriculture teachers indicated they do require all students enrolled in their agriculture classes to have a SAE, while 34 do not. In addition, 64 participants indicated a portion of each student's grade is dependent on their participation with a SAE. When the participants were asked what percentage of students enrolled in their agriculture classes had a SAE, the average was 68.39% (SD = 30.82). When asked how many hours of instruction was dedicated to teaching students about SAEs each year participants indicated that they provided on average 6.27 hours (*SD* = 3.54) of SAE instruction for introductory level classes, and for non-introductory level classes provided 4.51 hours (*SD* = 3.65) of SAE instruction.

Survey items related to objective two indicated 55 of the agriculture teachers require students to create a written plan for their SAE before beginning their SAE. All 55 said both students and the agriculture teacher have input into creating the plan. In addition, 48 indicated parents had input, three indicated administration had input, and 36 indicated the employer had input if it was a Placement/Internship SAE. Sixty-seven participants indicated they did require short-term goals and said the following people had input in creating those goals: Student = 61, Agriculture Teacher = 65, Parent(s)/Guardian(s) =52, Administration = 3, Employer (if it was a Placement SAE) = 37, Members of the Advisory Committee = 5, and Other Community Members = 8. Only 19 of the participants indicated they required students to set long-term goals.

For objective three, 92 participants indicated they did supervise SAE projects. When asked how often they supervise SAE projects the highest two responses were "twice a semester" ($f = 22$) and "twice a month" ($f = 18$). The lowest two responses were "once a year" ($f = 2$) and "less than once a year" ($f = 2$). 74% of those who did supervise said they supervise one type of SAE more than others. Entrepreneurship/Ownership and more specifically animal projects were indicated as the type of SAE that requires more supervision.

Results for objective four showed 77 participants require students to keep SAE records. Sixty-four participants provide a record keeping system for students to use, and 41 of those provide an electronic record keeping system. Seventy-three participants indicated they provide an average of 4.11 hours ($SD = 2.55$) of instruction about record keeping. Forty-four participants indicated they provide students with class time to work on their SAE records. When asked how often students were given class time to work on SAE records the following results were given: daily = 1, twice a week = 2, once a week = 3, twice a month = 10, once a month = 17, once every six weeks = 3, once every two months = 5, twice a semester = 9, once a semester = 6, once a year = 1, and only when it time to apply for degrees/awards = 4.

Finally, for objective five, when asked how they encourage students to receive recognition for their SAEs the following results were given: exhibit SAE in local/county fairs = 86, exhibit SAE in regional/state fairs = 39, apply for FFA degrees = 78, apply for FFA Proficiency Awards = 63, apply for local banquet awards = 61, and other = 13. The following were given when asked what other types of recognition were encouraged: community presentations = 2, scholarships = 2, portion of course grade = 1, community service awards = 1, district newspaper = 1, and classroom SAE awards = 1.

Conclusions/Implications/Recommendations

When looking through the lens of the conceptual framework of this study, which proposes "teacher responsibilities" related to SAEs (Phipps et.al, 2009), it appears that some Washington teachers are fulfilling their SAE responsibilities while others are not.. Additional research should explore what resources and professional development will assist agriculture teachers in fulfilling their SAE duties. By assisting teachers to fulfill their SAE responsibilities more students will benefit from the inclusion of all three components of the three-circle model of agricultural education. Programs training preservice agriculture teachers should include instruction in SAE practices and provide resources for future teachers to use with their students. Furthermore, this knowledge could be used to coordinate a national effort to improve the quality of SAE programs in all states, therefore this study should be replicated in other states.

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Supervisor Influence and Reflections on a Student's Congressional Internship Experience

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Supervisor Influence and Reflections on a Student's Congressional Internship Experience.

Introduction & Conceptual Framework

Congressional internship experience and programs on Capitol Hill have grown in number and popularity with many colleges, universities, and foundations (Gryski, Johnson, & O'Toole, 1987). Originally, congressional internships focused on students who were seeking a degree in the political science field (Gryski, Johnson, & O'Toole, 1987), but have since spread to all disciplines (Fleishman, 2004). Despite the popularity and resources dedicated to congressional internships and the participants, Hedlund (1973) stated the literature has largely ignored questions regarding the scope, structure, and strategies of congressional internship programs. Hedlund (1973) also found that the work a congressional office assigns an intern might affect a student's experience along with the size and specialization of the office. To create meaning, engaged learning in congressional internships (Research Priority 4; Roberts et al., 2016), research is needed to guide this effort.

Methodology

The purpose of this study was to identify the impact an intern supervisor has on an interns' experience and the changes in their student the supervisor witnesses during their time in Washington, DC. Research objectives used were: (1) Describe how a supervisor might affect a student's congressional internship experience; and (2) Identify the areas in which the supervisors felt the students' experienced personal growth or change because of the congressional internship experience. The design of this study was a qualitative grounded theory approach to investigate the research objectives with constructivism as its philosophical approach. The researcher utilized direct observations, emails between the researcher and intern supervisors, and end-of-semester evaluation forms. In addition, supervisors' phone calls, emails, face-to-face interaction with the researcher, the end-of-term evaluation form, and journal entries of student interns related to their supervisor allowed the researcher to chronicle supervisors' evolving thoughts and feelings throughout an intern's time in Washington, DC. A comparative method of open, axial, and selective coding was utilized as broad categories were identified through the prevalence of phrases, terms, and concepts (Creswell, 2013). From the open coding, axial coding was then utilized to further organize the concepts, codes, and phrases. Final themes were created through continuous comparison and refining of the open and axial codes allowing the researcher to create relational categories (Glesne, 2011). The researcher addressed credibility, transferability, dependability, and confirmability to ensure trustworthiness in the qualitative procedure.

Participants were limited to those who provide the direct congressional office supervision for a students participating in the program in Washington, DC during the spring, summer, or fall 2015 semesters with individual data beginning with the office placement process until all requirements for the internship were completed. The population included 31 intern supervisors. Of the supervisors, 29 (93.5%) held the title of staff assistants and two (6.5%) were schedulers. Within the 31 supervisors, 25 (80.6%) were former interns through either Texas Tech University or another institution or program. The other six (19.4%) supervisors had either interned in federal or state government or simply managed to earn their job as a staff assistant without a congressional internship. For all of the staff assistants (n = 29; 93.5%), this position was there first paying job out of college. The schedulers (n = 2; 6.5%) had both been staff assistants prior to moving up into a scheduler position. While not every age of all 31 supervisors was assessed, the youngest known supervisor was 21 while the oldest, a scheduler, was 30. The secondary population of this study included students who interned on Capitol Hill in Washington, DC during the 2015 spring, summer, or fall 2015 semesters (January 2015 - December 2015). The secondary population's data was gathered to provide an additional reference point to better

understand the supervisors' perspective of the intern's time in Washington, DC and the context of their role in the intern's experience (Erlandson et. al, 1993; Lincoln & Guba, 1985). The population included 58 students. Of these participants, there were 38 females (65.5%) and 20 males (34.5%). The youngest student was 19 years old at the start of the internship, and the oldest was 27 with an average age of 21.7 years. There were 11 graduate students (19.0%) and 47 undergraduates (81.0%).

Findings

Research Objective One: For the students who interned during 2015 (N = 58), 54 (93.1%) journaled that they met the congressional member they were working for, but not one described creating a strong working relationship with that member. However, all 58 (100.0%) mentioned daily and frequent interaction with their supervisors. Four themes emerged: (a) intern's time in the office; (b) supervisior maturity, length of tenure, and mentorship; (c) office expectations, and (d) expectations created by past interns.

Research Objective Two: At the end of an intern's time in Washington, DC, the intern supervisors are asked to complete an evaluation form to review a student's progress and overall development throughout the semester. Overall, the students faired best in the "quality" category with an average of 4.57, and the lowest category was "initiative" with a 3.32. There were 11 (18.9%) students who received fives in all categories. Three themes emerged: (a) professionalism, initiative, maturity, and confidence; (b) skill development; and (c) office needs and preferences.

Conclusions and Recommendations

Congressional internships are unique experiences giving students from a variety of backgrounds and academic interests an opportunity to learn more about the way the federal government functions. An intern supervisor plays an important role during an intern's time in Washington, DC. In the workplace, the supervisor has the most direct contact with the intern and sees firsthand how the intern progresses and changes in the role. As themes began to emerge throughout this grounded theory study, the researcher was able to focus on how an intern supervisor can affect a students' time in a congressional office and what a student learns and develops during the internship. The resulting themes indicate the presence of pre-internship factors and how the intern changes subsequently influence future intern needs & expectations (Figure 1). Although all students' personsonalities and backgrounds are different and supervisors have different management styles and abilities, the results increase our understanding of how students' could be better recruited to the program, matched with appropriate offices, and supported throughout their time in the internship as well as what impact (positive and negative) an internship supervisior can have on the learning environment.

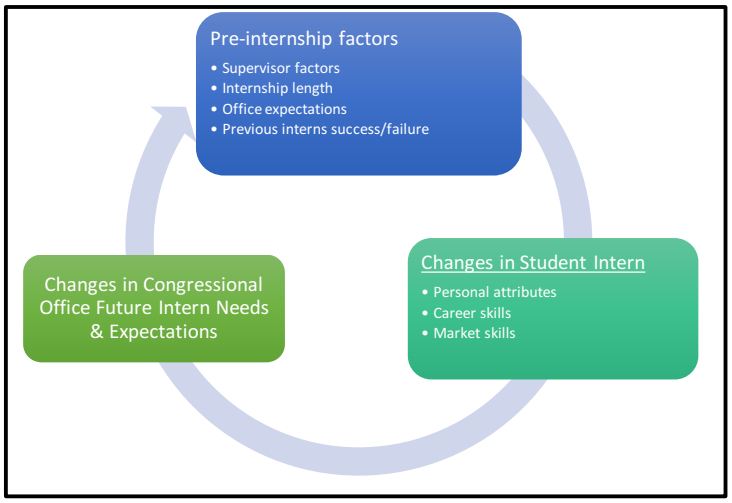

Figure 1: Factors that Influence Student and Internship Program Growth and Long-term Success.

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Sustainable Social Media

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Sustainable Social Media

Introduction/Need for Research

The sustainable agriculture movement can trace its roots to the farmer-scientist groups of the early 20th century (Harwood, 1990) and has evolved along with the technological advances of global agriculture industry. The concept of sustainable agriculture production is of particular importance today as the proportion of the world's people considered hungry has decreased, despite a doubling of the population over the past 50 years (World Bank, 2009; FAO, 2015).

Millions of people, each day, interact using social media platforms (Meredith, 2012), which have become some of the most frequently utilized applications on the Internet (Ramanadhan, Mendez, Rao, & Viswanath, 2013). Organizations use social media to connect with diverse audiences to build relationships and share information (Animal Agriculture Alliance, n.d.). Social media has become an optimal choice for organizations to reduce marketing costs while reaching a wider audience to promote new ideas (Kirtis & Karahan, 2011).

While the general public still has faith in farmers, some are still wary of modern agricultural practices (Animal Agriculture Alliance, n.d.). Implementing social media in the marketing strategy of sustainable agriculture organizations (SAOs) is an opportunity for these entities to 'agvocate' to the general public (Animal Agriculture Alliance). Communication to stakeholders is most effective when strategies are based on research and choice of channels however, many organizations lack the necessary skills and expertise to be efficient information managers and thus, more research is needed to determine the most effective models to reach target audiences (Andres & Woodard, 2013). The purpose of this study was to explore the social media presence of SAOs in the western region of the United States. Guided by King, Ford, Barksdale, and Meyers (2016) the research questions for this study were:

RQ1. Which social media platforms are SAOs using?

RQ2. Are SAOs listing their social media presence on their websites?

Theoretical Framework

The theoretical framework for this study is based on Grunig and Hunt's (1984) situational theory of public relations. The goal of public relations is to identify significant audiences, determine effective communication messages, and select the most effective delivery methods (Hamilton, 1992). The theory posits that communication behaviors of individuals are either active or passive (Grunig, 1989a), where active communicators are more likely to have attitudes about a situation (Grunig, 1989b) and expend effort to locate and consume information (Grunig, 1989a) to do something about the situation (Grunig, 1989b). On the other hand, passive communicators produce little effort to seek information however, if the situation is involving, the individual will passively process it (Hamilton). The theory, as noted by Hamilton (1992), is a powerful tool to predict communication behavior among various audiences.

Methodology

To identify SAOs in the western region, the researchers consulted a list of sustainable agriculture organizations provided by the National Center for Appropriate Technology (NCAT) (Schahczenski, 2015). Only organizations with an existing social media presence of at least an organizational Twitter handle and Facebook page were included in the study. This resulted in a

total study population of 50 organizations. Each organization's website, Twitter handle, and Facebook page were evaluated to determine additional social media links were present.

Results/Findings

Of the 50 organizations in the western region, 43 (86%) had at least one social media outlet in addition to Facebook and Twitter. Table 1 provides a frequency for various social media outlets. Of those that had additional social media, all (100%) listed their social media presence on their website. The number of social media outlets used, not including Facebook and Twitter, varied from zero to four with a mode of 1.0 and a mean of 1.93 (SD = 0.93).

Table 1
Frequency of social media platforms used to by sustainable agriculture organizations in the western region

Social Media Platform	*n*	%
YouTube	24	48.0
Instagram	21	42.0
Pinterest	12	24.0
LinkedIn	11	22.0
Google+	6	12.0
RSS	3	6.0
Flickr	2	4.0
Vimeo	2	4.0
Tumblr	1	2.0
SlideShare	1	2.0

Note. Percentages do not equal 100% as organizations could use more than one social media outlet

Conclusions/Implications/Recommendations

Nearly 90% of the organizations studied are currently using social media in addition to Facebook and Twitter. YouTube and Instagram were the most commonly used social media outlets with over 40% of the organizations using one or both; other platforms were present, but to a lesser extent. All organizations cross-promoted their social media accounts on their websites, Facebook pages, and Twitter handles. The organizations, on average, were using multiple social media platforms, but seven did not have a social media presence outside of Facebook and Twitter. This poses a challenge when attempting to engage audiences in social marketing efforts. These organizations should research the value of including additional social media platforms to their marketing plan.

Sharing sustainable agriculture practices via social media increases the visibility of the positive attributes of the agriculture industry. Future research should examine what relationship may exist between the types of content provided on social media and impacts on the general public's perceptions and awareness of contemporary sustainable agriculture practices.

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The Relationship Between Familiarity with the Texas Alliance for Water Conservation and Use of Water Conservation Behaviors

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The Relationship Between Familiarity with the Texas Alliance for Water Conservation and Use of Water Conservation Behaviors

Introduction

Spanning beneath eight states, the Ogallala aquifer is one of the world's largest underground sources of freshwater. The Texas High Plains region sustains agricultural production by using the Ogallala as a source of irrigation water. Since it was established in 2005, the Texas Alliance for Water Conservation (TAWC) project has worked to extend the life of the Ogallala aquifer through research and education efforts (TAWC, n.d.). The TAWC is a partnership of agriculture producers, industries, universities, and government agencies with the mission to "conserve water for future generations by collaborating to identify those agricultural production practices and technologies that, when integrated across farms and landscapes, will reduce the depletion of groundwater while maintaining or improving agricultural production and economic opportunities" (TAWC, 2015, para. 1). Evidence exists that producer-members of the project have successfully integrated water conservation practices on their demonstration sites to use their water more efficiently and effectively. However, more research is needed to determine the current use of water conservation practices among agricultural producers outside of the project in the Texas High Plains. Findings from this study could be beneficial to other water conservation organizations across the entire Ogallala Aquifer, as well as other areas of the nation who are seeking ways to encourage producers to implement more efficient practices.

Theoretical Framework

The theoretical framework for this study was based on Rogers (2003) diffusion of innovations theory. According to Rogers (2003), "diffusion is the process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). Innovations are ideas, practices, or objects that are seen as new by an individual. To encourage broader adoption of an innovation, change agents and others must work fervently and often over a long period of time (Rogers, 2003).

Purpose and Research Questions

The purpose of this study was to explore what impact the TAWC has on Texas High Plains agricultural producers' adoption of water conservation practices. The primary research question was: What is the relationship between the respondents' familiarity with TAWC and use of water conservation practices?

Methods

This study used descriptive survey research methodology with a questionnaire mailed to 1,000 agricultural producers in the 39-county area of the Texas High Plains who were not TAWC producer-members. Respondents indicated their familiarity with TAWC outreach efforts and current use of water conservation behaviors. Respondents were given several specific practices within each of these behavior categories and asked to indicate "yes" or "no" in regard to current use. Producers' familiarity with the TAWC project was measured using a 5-point Likert-type scale were 1= *Not at all familiar* and 5= *Extremely familiar*. Data were then recoded to create two groups with *Not at all familiar* and *Slightly familiar* in one group and those who were *Somewhat*, *Moderately*, and *Extremely familiar* in another. Additional data were collected, but are not reported in this manuscript. Data analysis was conducted using SPSS® version 22 for

Windows™. A total of 183 responses were collected, but only 108 were complete enough for subsequent analysis.

Findings

Sixty-two respondents were classified as "not as familiar" with TAWC and 46 were classified as "more familiar" with TAWC. Of those classified in the "not as familiar" group, 31 were not at all familiar with TAWC. A cross tabulation analysis demonstrated the relationship between respondents' level of familiarity with TAWC and use of techniques to irrigate crops (Table 1), monitor soil moisture (Table 2), and evaluate crop water demands (Table 3).

Table 1.
Use of Irrigation Techniques by Level of Familiarity with TAWC

	Number of Techniques		
Level of Familiarity	None	1	2 or more
Low	11	13	22
High	5	11	18

Table 2.
Use of Techniques to Monitor Soil Moisture by Level of Familiarity with TAWC

	Number of Techniques		
Level of Familiarity	None	1	2 or more
Low	9	31	10
High	3	16	16

Table 3.
Use of Techniques to Evaluate Crop Water Demands by Level of Familiarity with TAWC

	Number of Techniques		
Level of Familiarity	None	1	2 or more
Low	28	10	12
High	7	6	23

Conclusions/Implications/Recommendations

As change agents, members of the TAWC are working to encourage broader adoption of water conservation techniques. Based on a visual inspection of the data, it appears the TAWC may have a stronger influence on producers' adoption of soil moisture monitoring and crop water demand evaluation techniques than producers' use of advanced irrigation application technologies. This needs to be further examined in future research because the TAWC seeks to encourage the responsible use of all three of the water conservation behaviors instead of just one or two of the behaviors. For practitioners, this study provides support for continued outreach and communication efforts to encourage adoption of water conservation behaviors.

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Time Devoted to Teaching: An Analysis of an Extended Student Teaching Semester

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Time Devoted to Teaching: An Analysis of an Extended Student Teaching Semester

Introduction

The student teaching experience has been touted as the seminal experience for prospective teachers of agricultural education for decades (Edgar, Roberts, & Murphy, 2009; Edwards & Briars, 2001; Schuman, 1969). Oklahoma State University implements Retallick & Miller's (2010) model outlining teacher development in which theory is melded into the real world through early field experiences (Retallick & Miller, 2010). "Clinical field experiences allow pre-service teachers to identify linkages between theory and practice" (Retallick & Miller, 2010, p. 62). To create this stronger connection and help pre-service teachers acquire and practice effective teaching behaviors in real world settings, Oklahoma State University increased the student teaching experience from 12-weeks to 15-weeks.

Theoretical Framework

This study is theoretically grounded in Knowles and Cole's (1994) experiential learning cycle/spiral for teacher preparation that is based in the work of Kolb (2015) and Dewey (1938). The student teaching experience is a cyclical learning experience where student teachers are exposed to teaching in authentic settings, gather information and documentation, reflect and develop personal theories, and then move into the next teaching experience with informed action (Knowles & Cole, 1994). Additionally, the Retallick and Miller (2010) model conceptually delineated the various EFE experiences, of which this specific study would focus on the stand-alone experience that is student-centered and driven by the cooperating teaching center (Retallick & Miller, 2010).

Purpose and Objectives

The purpose of this study was to describe the Oklahoma Agriculture, Food, and Natural Resource career pathway content being delivered, the levels of classroom involvement by student teachers in the experience, and identify the differences that result in both the 12 and 15-week student teaching format approaches. The objectives were to 1) Describe the frequency of Oklahoma AFNR career pathway topics taught by Fall and Spring student teachers in the 12-week and 15-week formats, and 2) Describe the amount of time student teachers in the Fall and Spring semesters were involved in observing, team teaching, and teaching in the 12-week and 15-week formats.

Methodology

This descriptive survey study focused on the census of preservice teachers completing their student teaching internship during the 2015 and 2016 fall and spring student teaching semesters ($N = 53$). The spring 2015 cohort ($n = 12$) and fall 2015 cohort ($n = 9$) completed 12-weeks of student teaching while the fall 2016 cohort ($n = 10$) spring 2016 cohort ($n = 22$) completed 15-weeks. Data were retrieved from archived, weekly journal reflection reports submitted electronically each week by the student teachers. Students self-reported the days that were spent observing, team teaching, and teaching along with the lesson topics taught. Program coordinators reviewed each report for accuracy; SPSS Version 20 was used for data analysis. The Spring and Fall data was analyzed separately due to the uniqueness of each semester experience to focus analysis on the extension of the student teaching experience. A census study permitted

conclusions to be drawn about the entire population. Therefore, random sampling, hypothesis testing, and the use of inferential statistics are not necessary (Creswell, 2005).

Results/Findings

Regarding the first research question, the implementation of a 15-week student teaching format led to an increase of total instructional hours devoted to AFNR pathways in the fall (Δ +27.2) and spring (Δ +117.5) semesters. The 15-week format led to additional time devoted to each of the AFNR pathways, excluding Plant and Soil Science (Δ -4.4) and Natural Resources & Environmental Science (Δ -2.9) in Fall 2016 and Agricultural Communications (Δ -5.2) in the Spring 2016 semester. The largest amount of instructional time was spent on Animal Science, Agricultural Power, Structures & Technology, and Plant and Soil Science pathway lessons regardless of format. Of all the semesters, the spring 2016 student teachers spent the most time in the animal science pathway (89.9 hours). As for the second research question, it was found that the frequency of teaching per week spiked higher in the 15-week format (F16 = 19.5, S16 = 12.7) than in the 12-week format (F15 = 16, S15 = 10.4). The 15-week format also led to extended periods of teaching compared to the 12-week format. The 12-week format utilized team teaching at the beginning of the student teacher experience more than the 15-week format.

Conclusions/Implications/Recommendations

The majority of instructional time was spent on animal science, power and technical systems, plant science, and soil science regardless of the format. Oklahoma ranks eleventh in all livestock and poultry production, as well as fourth in wheat production nationally (United States Department of Agriculture, 2012). Additionally, manufacturing and production are one of the largest percentages of private employment in the state (Evans, 2017). Census data and trends are driving agriculture, food and natural resource career pathway topics taught in the classroom towards preparing students to enter careers in three of the largest state economic sectors. Teacher preparation programs should collaborate with agriculture departments to ensure teacher aspirants are exposed to the technical content needed to deliver instruction in the AFNR pathways.

Classroom assistance such as team teaching is seen as one of the purposes of early field experiences (Retallick & Miller, 2007). The bridge between observation and teaching through classroom assistance occurred more frequently in the 12-week format. Yet, the 15-week format led to increased independent instruction that began earlier in the experience. Student teachers in the 15-week format were able to immerse themselves in the individual teaching aspect of the experience. This allowed more time for the Knowles and Cole (1994) experiential learning spiral to refine the pedagogical theories developed as student teachers fully manage the classroom.

As suggested by Retallick and Miller (2010), the implementation of the early field experience included early scaffolding of teaching followed by increasing independence. Both the 12-week and 15-week student teaching blocks witnessed skills and developed techniques during their time observing and team teaching at the learning centers. As the experience progressed, the Retallick and Miller (2010) model was visible as the student teacher transitioned from observing their cooperating teacher as a student, to independently conducting lessons as a teacher without the guidance of the cooperating teacher. Teacher educators should provide professional development to cooperating teachers so that they better understand the value and approach to preparing teacher aspirants for the independent phase of the student teaching experience.

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Washington Agriculture Teachers' Perceptions of Barriers for Implementing Curriculum for Agricultural Science Education (CASE)

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Introduction

Since its first pilot test in 2009, Curriculum for Agricultural Science Education (CASE) has been met with success in terms of student learning and engagement. Agricultural education teachers that use CASE have found students with varying academic needs are effectively being served by the curriculum in terms of content learning and comprehension. Teachers have found CASE is able to create routine, pattern, consistency, organization, and structure in the day-to-day environment. This in turn allows students to stay on track and creates predictability in the classroom (Velez, Lambert, & Elliot, 2012). Student engagement is important for controlling student behavior, increasing student achievement, as well as increasing student retention of material. One study found student engagement, both active and passive, were increased in the CASE classroom (Witt, Ulmer, Burris, Brashears, & Burley, 2014).

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Agricultural education teachers across the United States have begun adopting CASE. In the summer of 2016 there were 40 states, along with the Virgin Islands, that have teachers implementing CASE in their own classrooms. Nationwide in the summer of 2016, there were 1,134 CASE certified teachers. In Washington alone there were a total of 262 agricultural education teachers, only 85 of which are actually CASE certified. This means that roughly one-third of Washington's agricultural education teachers are CASE certified (M. Chaplin, personal communication, April 20, 2016). In order for CASE to become more prevalent in agriculture programs it is important to discover why non-CASE certified teachers are choosing not to adopt the curriculum. Therefore, the purpose of this study was to identify barriers Washington agriculture teachers face in becoming CASE certified. This study relates to Priority 5: Efficient and Effective Agricultural Education Programs of the National Research Agenda of the American Association of Agricultural Education (Roberts, Harder, & Brashears, 2016).

Conceptual/Theoretical Framework

This study was framed around Roger's (2003) Decision-Innovation Process. This process of development is an information-gathering and information-processing activity through which an individual makes a decision about an innovation. The process consists of five steps: knowledge, persuasion, decision, implementation, and confirmation. In the scope of this study the participants are in the first three phases of the Decision-Innovation Process.

Methodology

This study utilized a survey design using a researcher-developed instrument. This study was a part of a larger study which also sought to describe the use of CASE in Washington. All 262 agricultural science teachers in Washington were sent an email containing a link to the survey. This survey was completed by 97 agricultural education teachers for a response rate of 37%. Of the 97 agricultural education teachers that participated in this larger study, 60 were non-CASE certified. These 60 non-CASE certified teachers are the sample for this study.

Results/Findings

The most common reasons for Washington teachers to not become CASE certified was many were happy with the curriculum currently being used in their classroom (37.93%) and the lack of time to get trained in the CASE curriculum (31.03%). The least common reasons preventing certification was the belief that CASE is too science focused and not agriculture focused (1.79%), along with the idea that CASE does not fit individual teaching styles (5.17%).

Participants were also asked to select one item that was their main barrier for becoming CASE certified. “I don’t have time to get trained in the CASE curriculum.” was the largest barrier with 12 (21.43%) participants selecting it as their main barrier. Of the 60 non-CASE certified agricultural education teachers that participated in this study, 33 (56.90%) were interested in becoming CASE certified in the future while 25 (43.1%) were not interested in becoming CASE certified.

Conclusions/Implications/Recommendations

For agricultural education teachers in Washington, there were several factors contributing to their decision to remain non-CASE certified. The data in this study revealed that there are two factors that tend to be more prevalent than others; the lack of time available to receive the CASE training and a feeling of contentment with the current curriculum being used. The most commonly selected barrier for teachers was the lack of time to receive the training required to become CASE certified. This is largely due to many factors in an agriculture teacher’s life that divide their attention. Many teachers are not only responsible for preparing and implementing curriculum for multiple classes but are also responsible for the FFA and SAE aspects of the agriculture program along with facilities management. With so many agricultural education teachers busy managing the various aspects of their programs it becomes difficult to find time for CASE training amidst everything else. The CASE institutes are also only offered during the summer when agricultural education teachers are busy preparing for livestock events as well as preparing their classrooms for the upcoming school year. Some agricultural education teachers also work other jobs to supplement income during the summer months. The second most selected reason for remaining non-CASE certified was contentment with the current curriculum being used in the classroom. Often these teachers have worked hard to develop or find the curriculum they use or feel that CASE does not offer anything new or better for the agriculture program.

The issue of time is supported by research conducted on preservice teachers trained in CASE during a semester course (Carraway, Ulmer, Burris, & Irlbeck, 2015). One portion of this study identified barriers preservice teachers foresee in CASE certification. One of those barriers was lack of time for training (Carraway et al., 2015).

Continued research should explore the barriers identified in this study and resources should be provided to assist teachers in overcoming these barriers. This research should also be replicated in other states to determine if these barriers are consistent across the nation.

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What's in Fido's Food? A Content Analysis Comparing Front-of-Package Food Images to Actual Ingredients in Dog Food

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Introduction

In the grocery retailer setting, consumers' cognitive constraints in a visually competitive environment mean they are frequently influenced by visual communication, like images of ingredients on the front of packages (FOP), to make food purchase decisions. Pet food is an interesting example of packaged food because it must communicate a variety of ingredients all contained within a single product for a fully-balanced animal diet. Manufacturers' written claims are tightly regulated (Association of American Feed Control Officials, 2016), leaving communicators to use FOP design elements to enhance branding and healthful associations with their products that may only loosely align with actual ingredients. Consumers may assume FOP images identify desired main ingredients in their pet food when that might not be the case.

Conceptual Framework

Several studies summarize the importance of FOP visual elements in food-related decision making. In an eye-tracking study by Ares et al. (2013) participants fixated the most on the FOP image, followed by brand, nutritional information, and ingredients. When participants were considering willingness to purchase and perceived healthfulness, the image on the package front was the second item observed by most participants. Abrams, Evans, and Duff (2015) found parents rely heavily on FOP imagery and design to select snack foods quickly for their preschool age children. They will make different assumptions about a food's relative nutrition and/or function based on the visuals, even if the food itself is identical or nearly identical nutritionally from product to product. Parents admitted they realize they are possibly misled by such visuals but tend not to think about it in the grocery store or thereafter (Abrams et al.). "Pet parents" may be influenced similarly, but no studies have examined consumer evaluations of pet food FOP information. Investigating marketplace practices of how the visual communication of pet foods compares to their ingredients is the first step to designing ecologically valid consumer effects studies. The purpose of this study was to determine if pet food FOP images accurately depict actual ingredients. The research questions were: 1) What FOP visuals are used on dog food packages? 2) What are the most common top 10 ingredients? 3) How frequently do FOP images match top 10 ingredients?

Method

Two coders independently coded 27 dry dog food products within the $7-$20 range for about a one-month's supply (based on feeding instructions) sold at the largest U.S. grocery retailer, Kroger (Statistica, 2013). The price range was chosen based on data from the Bureau of Labor Statistics (2017) stating the average pet owner spent about $19 per month on food in 2015. Coders assessed for 18 categories of food images (animal-based protein, grains, produce, and other) on the FOP. Following the FOP image assessment, the same method was used to identify the presence of each food ingredient within the first 10 ingredients listed on the back of the package. A relational assessment was also made by each coder to determine matches between FOP food images and the top 10 ingredients. Interrater reliability was excellent with κ =0.95 or higher on all variables.

Findings

The most frequently occurring images included chicken from the animal protein category, peas and carrots were about equal in the produce category, and in grains, most products did not feature any image of a grain (Table 1). In the top 10 ingredients within the animal protein category, chicken was present on the majority, followed by "other" (animal by-products and fats, bison). Most did not contain any produce in the top 10 ingredients. Grains were in most products' top 10 ingredients (85%, n = 23), with "other" (e.g., soybean meal, beet pulp) being the most common, followed by corn (Table 1). To add to RQ3 findings, we analyzed each product individually to determine the

match between FOP food images and their presence/absence in the top 10 ingredients. Data showed each product had an average of 34.8% (Mdn = 33%) match between FOP images and the top 10 ingredients. Eleven products had a match between images and ingredients for 50-67% of foods, meaning 50-67% of the foods pictured on the FOP were also in the top 10 ingredients. Nine showed a match of 20-40% between images and ingredients; and only 2 had a match of 70-75% between images and ingredient. Five showed no matches between top 10 ingredients and FOP images.

Table 1

Occurrences of FOP Food Images, Top 10 Ingredients, and Matches Between Them

Ingredient Category	Food Image	Percentage Pictured	Percentage in Top 10	Percentage a Match
Animal-based protein	Chicken	55.6%	92.6%	51.9%
	None	18.5%	0.0%	18.5%
	Beef	14.8%	37.0%	14.8%
	Lamb	7.4%	7.4%	7.4%
	Fish	7.4%	22.2%	7.4%
	Pork	0.0%	7.4%	0.0%
	Other	0.0%	48.1%	0.0%
Produce (fruits and vegetables)	Peas	51.9%	25.9%	18.5%
	Carrots	48.1%	0.0%	0.0%
	None	33.3%	74.1%	81.5%
	Other	25.9%	14.8%	11.1%
	Sweet Potatoes	18.5%	7.4%	3.7%
	Lettuce	11.1%	0.0%	0.0%
Grain	None	70.4%	14.8%	66.7%
	Rice	22.2%	48.1%	22.2%
	Corn	11.1%	77.8%	11.1%
	Wheat	3.7%	51.9%	3.7%
	Other	0.0%	88.9%	0.0%

Conclusions, Implications, and Recommendations

About half of the food images were not present in the first 10 ingredients. Animal-based proteins were commonly both pictured and listed in the top 10 ingredients. Produce was pictured on the majority but found in the top 10 ingredients on less than half. Grains, on the other hand, were pictured on less than 33%, but were found in the first 10 ingredients on 85% of the sample. In some cases, food pictured was not present in the ingredient list at all. These communication practices warrant serious concern for consumers' welfare. The first being perpetuation of false beliefs about healthy pet diets, like grains are unhealthy for most. The second being misleading consumers to buy more expensive or what appears to be healthier dog food when in actuality, the top ingredients may be low-quality protein sources or may not contain most of the vegetables pictured. Those in the pet health industry should be equipped to communicate with consumers about making healthy pet food choices and help them navigate marketing and advertising. This study also supports Abrams et al. (2015) contention that the food industry requires better regulatory guidance on visual communication. Future research should examine a wider range of pet food brands available in pet feed and supply stores, as well as effects of FOP visual communication on consumers.

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