Poster Session Proceedings

American Association for Agricultural Education Annual Conference

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One hundred fifty-one posters were received with 64 in the innovative category and 87 in the research category. Forty innovative posters were accepted (63% acceptance rate). Forty posters accepted for research (46% 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.

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Vincent, Stacy	University of Kentucky
Warner, Wendy	North Carolina State University
White, Peter	University of Idaho
Williams, Robert	Texas A&M University - Commerce
Wood, Meghan	North Carolina State University

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A Rigorous Teaching Experience Through a Middle School Agriscience Field Day

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A Rigorous Teaching Experience Through a Middle School Agriscience Field Day

Introduction

For Fall 2014, a New Mexico State University (NMSU) research team developed an agriscience field day for 8th grade science students at a middle school in northern New Mexico that gave university students enrolled in an agriscience teaching methods course an all-day teaching experience at the middle school. The middle school is involved in a cooperative agreement with the university to operate a Cooperative Extension Service-administered and staffed youth agricultural science center on site that emphasizes inquiry-based learning and experiential education (Kolb, 1984; Skelton, Seevers, Dormody, & Hodnett, 2012). The mission of the center is to develop a middle school model of teaching and learning excellence that complements in-class instruction by providing context to content (Skelton & Dormody, 2009). Context is linked to content and enhanced through agriscience and STEM (science, technology, engineering and mathematics) based curricula, activities, and experiments. The researchers are interested in whether agriscience programs delivered through this center can contribute to improved learning for a predominantly Hispanic and economically disadvantaged middle school student population (Skelton, Stair, Dormody, & VanLeeuwen, 2014) and to the professional development of future agriscience teachers. The focus of the learning activities prepared for the 2014 Memorial Middle School Agricultural Extension and Education (MMSAEEC) Agriscience Field Day was earth and physical sciences. This innovative field day was planned, implemented, and evaluated to determine impacts on 8th grade student learning related to the lessons presented by the university students and the perceptions of the university students related to the value and quality of the field day as an experiential learning activity for them.

Methodology

The MMSAEEC Agriscience Field Day was organized as part of a new class to develop agriscience teachers at NMSU called "Methods of Teaching Earth and Physical Sciences in Agriculture." With its new sister course, "Methods of Teaching Biological Sciences in Agriculture," the two courses recently took the place of one course "Agriscience Laboratory Methods" (Dormody, Skelton, Pint, & O'Byrne, 2011a) in the NMSU growing agriscience program. Eight students took the earth and physical sciences course in Fall 2014. In teams of four, the students developed two lessons that were cross-referenced with the state's agriculture, food, and natural resources standards and benchmarks (Castillo, 2003) and the Next Generation Science Standards for the middle school level (National Research Council et al., 2014). The themes for the two lessons were: 1) water quality testing of different water sources used at the center (deionized, tap, greenhouse roof water capture, and fish pond) and 2) determining the temperatures of different surfaces around the center's land laboratory using infrared thermometers. The field day was scheduled for early November and the university students taught their lessons to split halves of six 8th grade science classes with enrollments ranging from 12 to 24 students. As the day progressed, the university students were able to make modifications to improve their lessons. Because of snowfall and cold temperatures on the field day, the university students also had to make some adjustments in sample collection and teach their lessons in the center greenhouse to minimize time spent outdoors. At the end of the day, the university students took an evaluation on the field day. In a subsequent class, the 8th grade students were administered quizzes related to the objectives of the lesson they had experienced during the field day. With the 2014 field day, the researchers hoped to improve on a previous agriscience field day for 7th grade science students that focused more on the biological sciences and featured teams of two university students teaching their lessons twice per period to ¼ of each class (Dormody, Skelton, Madrid, & Dappen, 2011b; Skelton, Dormody, Dappen, & Madrid, 2011c).

Results and Implications

Eighty-six 8th grade students completed the quizzes for the field day. The 44 students who took the five-question multiple-choice water quality testing quiz averaged 58.6% correct answers. Individual students ranged from 1 to 5 correct answers. The highest performance was on the question "Dissolved oxygen is measured in (blank)?" with 81.8% right answers. The lowest performance was on the question "What is the importance of dissolved oxygen in water?" with 50% right answers. The 42 students who took the five-question multiple-choice surface temperature quiz averaged 67.1% correct answers. Individual students ranged from 0 to 5 correct answers. The highest performance was on the question "What were you trying to determine with the instrument used?" with 85.7% right answers. The lowest performance was on the question "What unit of measure did we use on the infrared thermometer?" with 40.5% right answers. Based on these results, to improve student performance in future field days the researchers recommend that pre-field day activities are developed and delivered to enhance the learning activities. Pre-field day activities can be used to introduce concepts, prepare students for the learning activities, and familiarize them with terminology and equipment.

All of the university students felt the MMSAEEC Agriscience Field Day met or exceeded their expectations. All responded that they liked the field experience and learning how to teach by actually teaching versus listening in a lecture-based course. They learned the value of planning, how to adapt a lesson to changing conditions, how to keep students engaged and make the material relevant to them, and how to be outgoing and enthusiastic teachers. They felt they had been effective teachers from the answers students gave to probing and summary questions, student performance in figuring temperature averages, and student decisions about rejection or acceptance of their original hypotheses. Two comments for improving the field day were made by four of the university students: 1) provide them a bell schedule prior to the field day and 2) provide them with an overview of what the students had already studied in 8th grade science prior to the field day. For future field days, these improvements will be made, university students will be given more in-class planning time, and the field day will be moved into October to reduce the risk of encountering bad weather. Whole-period lessons allowed for better pacing, and more student-teacher interaction and checking for learning than the half-period lessons given twice each period in an earlier field day (Dormody, et al., 2011b; Skelton et al., 2011c).

Future Plans

The results of the 2014 MMSAEEC Agriscience Field Day will be utilized to improve future field days for the middle school and university students. In future field days at Memorial Middle School the faculty team plans to test with other 8th grade and university students, additional new learning activities in climate science developed for diffusion and adoption in the state as part of a recently approved Agricultural Experiment Station/Hatch project. The climate curriculum will contain learning modules in monitoring climate and analyzing climate data, ways to mitigate and adapt to climate extremes in agriculture and natural resources, and climate-related careers in the state.

Costs

The cost of the 2014 MMSAEEC Agriscience Field Day was $1,460 which covered six double occupancy motel rooms for two nights ($740), gas for two passenger vehicles for three days ($200), two group dinners ($420), and lesson supplies ($100). Grant funds paid for university student lodging and departmental instructional funds covered the other costs.

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Agricultural Education Instructor Trading Cards

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Agricultural Education Instructor Trading Cards

Introduction/Need for Innovation

The Teach Ag workshop was created for an opportunity to get the attention of students who are interested in entering agricultural education at the post-secondary level. There is a teacher shortage when it comes to agricultural education. Jobs are available without universities producing enough teachers to fill the positions. [State] has experienced a 36% turn-over rate in agricultural educators in the past 2 years ("2014 Initiative for Secondary Agricultural Education Improvement," 2014). A variety of volunteers speak about their experiences during the workshop to give students an insight on teaching. The workshop is held each year at the State Leadership Conference for the FFA. The activity added to the workshop by allowing students to introduce themselves to more agricultural education instructors.

There has been changes in positions, graduation rates, and vacancies. An activity was used for recruitment and retention to keep things in balance. Agricultural Education Instructor Trading Cards is an activity that took place at the [State] FFA Leadership Conference in April, 2014. The purpose of the activity was to target FFA members interested in agricultural education. Having them introduce themselves to a variety of 19 pre-chosen agricultural educators throughout the state will show high school FFA members that agricultural educators in [State] are not the same in how they teach. The curiosity came from being interested in finding new ways to recruit new potential agricultural educators, keep those interested engaged and begin establishing a network of contacts in the profession. The trading card project directly aligned with Priority Area 3 – Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century from the *National Research Agenda* of the American Association for Agricultural Education (Doerfert, 2011).

How It Works

For the activity, 19 different agricultural educators were selected from the 120 teaching in the state, with representation from each of the 9 FFA districts. The "Teach Ag Stars" for the trading cards were chosen from chapter advisors and teacher educators at the state land grant institution. This activity was completed through a class entitled *Communicating in Agriculture* by an undergraduate student who showed interest in how to recruit more agricultural educators.

Teachers were given their pack of trading cards inside the registration packet for their FFA chapter. The cards included a picture of the selected educators on the front with their name in a banner. On the back, the Teach AG logo was used in the top left corner including their name in the center with the district they are from. Biography information was used to make the game more interesting and more personal for the students. The information contained was highest college degree received, where they graduated from college, how many years they have been teaching, where they teach agricultural education, where they are originally from, an interesting fact about themselves, and an inspirational quote from FFA, inside the classroom, or in general. Few interesting facts were, "I rocked a mullet in high school", "I have jumped out of a plane", and "I have ridden a bike over 5,000 miles". An entertaining quote that was provided was, "A sasquatch won't attack you if you become an FFA member". These pieces of information were included to help students remember different educators more easily when collecting cards

The game was introduced at the Teach Ag workshop on Thursday afternoon during the FFA State Leadership Conference. FFA members who are interested in agricultural education attend the workshop. Experienced high school agricultural education instructors, new high school agricultural education instructors, and university professors come prepared to talk to the FFA members. They share their experiences and some advice they have learned to excite the potential agricultural educators. The students were given small plastic boxes to hold the cards they collected making it more convenient for students to hold cards inside their official dress. The boxes included the rules and three trading cards as a starter pack because the teachers are notoriously difficult to find during the FFA State Leadership Conference.

Fifty copies of each card were printed on cardstock along with fifty copies of the rules for students and advisors that would be participating. The prizes for the participating students included buttons that could be displayed on their FFA jackets. The buttons were all different, and included quotes to catch the attention of the participants: “Only blue will do”, “Rock your ag swag”, “You miss 100% of the shots you don’t take”, and “Tuck in you tallywacker”. There were five different buttons made with a total of 150 buttons made for students. The 19 teachers who participated in the game were given a red button saying, “Carly thinks I’m awesome” to get the attention of other teachers for more participation next year.

Results to Date

During the conference, having the 19 agricultural educators wear the buttons got the attention of other students sparking interest This being the first year hosting the game, teachers became involved and students more outgoing. However, more students wanted to be involved that did not attend the Teach Ag workshop. Only 5 students collected their buttons from playing the game. However, more students who did not participate indicated they are interested to play next year.

Future Plans

Including more students and agricultural educators next year may improve the game. Educators were excited and interested in continuing their participation in future years. The goal is to eventually get all agricultural educators to play and increase to probability of students to continue into agricultural education and provide them with professional connections in the profession. The prizes worked as a great encouragement to have students play the game, and future years would require a greater number of prizes.

Costs/Resources Needed

The cost of printing the trading cards from the university printing center was approximately $200.00. The boxes for the students were ordered from Amazon costing $94.40. The button maker and supplies were replenished costing $50.00. The publication with the [State] FFA Leadership Conference consisted of participating in the Teach Ag workshop by presenting the activity to students. Having 19 agricultural education instructors with approximately 30 students participate were also resources needed to make the activity more affective.

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Authentic Assessment through a Barbeque Build-Off

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Authentic Assessment through a Barbeque Build-Off

Introduction

Priority 4 of the *National Research Agenda* (Doerfert, 2011) calls for meaningful and engaged learning in all environments with anticipated outcomes that include career readiness and professional success. In Texas, trade certification is recognized by industry and the Texas Education Agency as an effective method of assessing career readiness in a technical area, such as welding and metal fabrication. Welding certification focuses on knowledge and skill but does not consider the human factors of efficiency, cooperation, and organization of work as part of the assessment process. Blackburn and Kelsey (2013) reported on a model of authentic assessment for agricultural mechanics instruction that included "teacher commitment to student success, high and fair expectations, progressive hierarchy of skills, and student's knowledge of progress" (p. 12). The *Barbeque Build-Off* is a welding/fabrication competition for students in agricultural mechanics that adheres to this model for authentic assessment.

How it works

This competition is open to high school FFA chapters in a region of Texas where the agricultural mechanics career development event and project shows are very popular. Each chapter may enter one team consisting of three welder/fabricator members and one team cook. The entry fee of $500 covers the cost of the materials for each entry. Each team must provide its own welding truck or trailer with all tools, equipment, electrical power, and consumables (gas, electrodes, abrasives, etc) needed for the competition.

The event consists of the replicated construction of a barbeque pit based on a model provided by the event host/sponsor. Each team receives the exact same bill of materials on a pallet at their assigned fabrication site. They have 15 minutes at the beginning of the event to preview the model, consult with their teacher, and divide the tasks to be performed to fabricate the barbeque pit. At the end of the 15 minute preview, teachers leave and the remainder of the event is in the collective hands, hearts, and minds of each team. Team members work collaboratively to perform all the necessary tasks associated with fabricating the assigned project. Judges (2-3) from industry and/or regional university agricultural mechanics programs review each team's work throughout the six hour "production period." At the conclusion of the six hours, judges complete final inspection of each project for workmanship, quality of cutting and welding, dimensions, etc. and combine this with the ongoing assessments related to efficiency, safety, tool use, and teamwork to determine final placing.

Concurrently, while the three team members work on fabrication of the pit, the team cook prepares a meal sufficient to sustain all team members and provide a presentation plate to the judges for the jobsite cooking competition. Similar to the fabrication team, the cook must provide all tools, equipment, utensils, paper/plastic goods, food, and seasoning to provide five meals. The jobsite cooking entry is a way to include another team member while providing an opportunity for all team members to eat without having to leave the jobsite. Entries for this event are evaluated by a single judge.

Results to date

The *Barbeque Build-Off* has been held at Sulphur Springs High School for three years with 12-15 entries annually, this occurs in late April or May after state-mandated testing is completed for the school year. Teams are allowed to take their pit and materials back to their chapter, regardless of the state of completion, at the end of the competition. It is a project that may be finished at school, if needed. Most chapters secure a sponsor who is seeking a barbeque pit to fund their entry fee and possibly the consumables for the event.

Each year, many local media and community members as well as parents and supporters from the competing chapters attend this event. There are welding supply sponsors and trade schools on hand to promote their new products and services to the spectators. It is a very entertaining event. More importantly, it is an excellent way for students to demonstrate and/or realize if they are prepared to work in a field production, team setting with little direct supervision in *real -time* under *real-world* conditions.

Future plans

The agricultural mechanics teacher who previously organized and hosted this event has moved into administration in the same school district. Since the new agricultural mechanics teacher was from a school that had previously participated, it is very likely the event will continue. There is potential for this event to be adopted in other regions or adapted to other fabrication projects. A similar event, where students build a utility trailer instead of a barbeque pit, has been scheduled by a school that previously competed in this event.

Cost/resources needed

The event requires an area large enough to accommodate the anticipated number of entries. Each contestant is provided with a t-shirt that is typically sponsored by vendor associated with agricultural education and FFA programs. Prizes such as welding hoods, gloves, jackets, hand tools, welding clamps, and tool bags are sponsored by the local welding supply retailers and manufacturers of welding equipment. These prizes are awarded to the top team. Plaques are provided for the top placing teams. Judges are paid in gift certificates from the local welding supply retailers. As a result of significant sponsorship, community, and industry support, little direct financial investment is required from the hosting institution. However, many hours are required to plan, organize, and coordinate the event.

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Innovative Idea Poster

"Be Our Guest. Put Our Students to the Test"

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Introduction

Recommendations have been made for universities to do a better job of integrating employability and soft skills into curriculum, with communication skills a top ranked quality (Nunn, 2013; Purcell, 2014; Sewell & Pool, 2010). These skills are highly desirable to employers hiring recent college graduates (Norwood & Henneberry, 2006). Service-learning projects in the collegiate classroom can provide educators a vehicle for integrating soft skills training, especially communications skills and project management, into the curriculum (Barkley, 1999).

Service-learning is a vehicle for implementing such engagement and can be used to enhance students' transferability of skills from the learning activity to the workplace. (Robinson & Torres, 2007). Abes, Jackson, and Jones (2002) found the five factors that most strongly motivated service-learning use by university professors were “increased student understanding of course material, increased student personal development, increased student understanding of social problems as systemic, provided useful service in the community, and created university-community partnerships” (p. 4). Application of specific concepts and theories can best be learned through service-learning activities (Robison & Torres, 2007). Self-confidence, competence, and empathy are some of the personal benefits students realize through service-learning. Additionally, by engaging in problem solving and by working cooperatively and collaboratively with others, students are able to build skills needed for employment in today's workplace (Brown, 1998).

Maiga and Westrom (2006) found service learning activities increased students’ interest in a course and helped them grasp course concepts and theories more easily while providing an opportunity to contribute to the community. Further, students improved communication, leadership, and problem solving skills, enhanced their ability to work as a team, and increased their sense of civic responsibility (Maiga & Westrom, 2006). Students enrolled in an agricultural communications campaigns /service-learning course said the experience taught them practical skills, was rewarding, enjoyable, and they appreciated being able to work with a client (Hefley, 2012).

How It Works

Agricultural communications students at [University] are required to take Professional Development in Agricultural Communications. The course focuses on career and internship preparation as well as event planning and execution. These subject areas were recommended to the department by its alumni to be the focus areas of this course. In the event planning portion of the course, students plan and execute an event within one semester for an organization with a need for a professionally planned event. Events have included professional development workshops for alumni and communications industry members, an end-of-the year student showcase, agricultural issues forums, a departmental alumni reunion, and several banquets. The students take the knowledge they have learned in the classroom and apply it to real-life situations. Students work as a team to draft a budget, manage registration, book a venue, create advertising and promotional materials, and work with multiple vendors to ensure the success of the events. Once the event is over, students write a reflective summary, stating what they learned and thought was most beneficial for them.

Results to Date

The student-led events have occurred for three semesters, with the exception of the student showcase, which was introduced for the first time in Spring 2015. In 2014, 150 people attended the Agricultural Issues Forum; approximately 75 alumni attended the reunion; and 25 professionals have attended workshops. Some student reflection comments indicated they believe the activity is beneficial to their education. “Our committee’s greatest success was the participants’ satisfaction with the workshop.” “This event will prove extremely beneficial on our future careers. We had to apply time management skills and thorough planning. I think we also learned that attention to detail is very important.” “Planning and executing this event will be very beneficial to all of our futures because of the obstacles we encountered. It is a tough challenge to plan an event, but it taught us how to handle challenges and problem solve. Overall, this event was a great learning experience because we dealt with many vendors and real-world problems.”

Future Plans

[University] plans to continue teaching the professional development course. Students will continue to be involved in all aspects of planning and hosting events. There will likely be some fluctuation of events based upon department, college, university and community needs. Increased attendance and participation at all events is a goal for future semesters. In particular, students and faculty would like to improve attendance for the professional development workshops for members of the agricultural communications industry.

Costs/Resources

The cost depends entirely on the event and the number of people expected to attend. Events have been funded through donations, registration fees, student organizations, federal grants, and various departmental resources. Resources required include venues, catering, promotional and advertising materials, decorations, and educational material.

An additional cost has been time. Although students do the vast majority of the event planning, extra time outside of typical course planning is required for supervision. The instructor for the course attends and supervises all events, many of which are on weekends or after hours.

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Poster type: Innovative

Bringing Global Agriculture to Summer School: The Governor's School Experience

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Bringing Global Agriculture to Summer School: The Governor's School Experience

Introduction

In the 21st century, students attending agriculture programs are expect to build experiences of a broad and diverse world (American Society of Agronomy, 2010). In order to address the world's most pressing agricultural challenges, students must be open-minded, informed, and understand how their actions have an effect on both local and global levels (Association of American Colleges and Universities, 2010). Moreover, employers in Agriculture are seeking individuals who are ready to engage in global agriculture. Morgan and King (2013) note that, exposure to the global agriculture to agriculture students is very crucial because "as future agriculturists, students need to learn how global issues may impact their lives, the stability of our nation and have economic impact world-wide" (p.2). In its first articulated international strategy, the United State Department of Education (2012) called for "global competencies for all students" and "education diplomacy and engagement with other countries" (p.1). The National Research Agenda (Doerfert, 2011) for agricultural education addresses the need for a scientific and professional workforce in agriculture that can respond to global food, fiber and energy needs. Therefore, bringing a global agriculture course into the [State] Governor's School for the Agricultural Sciences program, will help student develop global competencies as future change agents by gaining knowledge, developing skills, and acquiring dispositions needed for living in globally interdependent and culturally diverse world.

Program Phases (How it works)

A team of multidisciplinary practitioners who had recently engaged in a wide variety of successful immersion learning experiences in global agriculture and in delivering on campus global learning opportunity collaborated to design an offering of a "course" for the [State] Governor's School for Agricultural Sciences. As part of the commitment to assist with the 4 week learning experience for 40 selected secondary students between the junior and senior years in high school, the instructional team agreed to deliver a course on Global Agriculture with 12 instructional contact hours; 8 in class session format and 4 in lab settings. The primary instructors (an agricultural teacher educator and a rural sociologist) assembled a team of graduate and undergraduate students seeking teaching and learning experiences. Instructional team included four graduates students where one had been an extension educator in India, another was an agriculture teacher in Malaysia and the final two had just returned from a month immersion experience in Korea. There were also four undergraduates involved, all who were agricultural education majors that had returned from recent global experiences. The course provide interactive, hand-on learning opportunities to develop knowledge of the food and fiber industry, experience intercultural activities, and identify individual opportunities to make a positive global impact. Student were engaged in classes and lab session in three area of global agriculture aspects 1) investing global food and fiber system [addressed the knowledge construct] 2) experience an intercultural activities [addresses the skill construct] and 3) identify opportunities for individuals to impact global agriculture [Addressed the disposition construct]. Instruction strategies include case study, cooperative learning, and experiential learning. Delivery of each lesson were facilitate by the global team which include international students at Penn State. A critical aspect included integrating active learning strategies like learning language, ordering food, and engaging in culturally appropriate agrarian dances lead by members of an international graduate student association.

Results to Date/ Implications

As part of the planning, the team developed 19 course objectives in the three themes:

1. Complete a case study analyzing the food systems required to make a Hershey's chocolate.
2. Investigate impact of research on global food systems.
3. Define terms related to global agriculture including food security, food system, supply chain, food miles and staple crop.
4. Examine food systems in the U.S. and India.
5. Define global competency
6. Define food security to instructor satisfaction.
7. Calculate daily nutrient requirement to sustain life and thrive in different regions of the world.
8. Create a daily menu for a specific world region
9. Participate in a cultural activity from another world region.
10. Learn and share 3 agriculture terms in a language other than English.
11. Learn 3 hospitality terms in a language other than English.
12. Sample food from another region of the world.
13. Discuss careers in global agriculture
14. Describe academic credentials designed to increase global competency available.
15. Describe types of study abroad opportunities available
16. Discuss the need and opportunity for global agricultural and extension education.
17. Create an individual Global Learning Plan to increase student global competency.
18. Describe the benefit of globalizing a post-secondary education.
19. Identify specific campus resources for global competency development.

Using a course evaluation instrument, a majority of students agreed that they learned a lot about global agriculture from the classes and lab sessions. By using a multiple item, 6 point Likert scale of 1 [Ineffective] to 6 [Very Effective] instrument to measure students' feeling for each learning experience showed a positive feedback. The lowest summated mean score was 5.22 and the highest summated mean score was 5.87. Students showed to be highly engaged in the discussion by asking questions and giving opinions. Students also showed enthusiasm for the material, activities, and speakers. The global agriculture classes and lab sessions demonstrated the ability to encourage student initiative, collaboration, creativity, and problem-solving.

Future Plans/Advice to Others

Future plans include continuing to offer this secondary outreach activity as a service to the college and as an authentic learning laboratory for agricultural teacher candidates to share and instruct on their own personal global experiences. Engaging external partners like international student organizations allows for effective engagement in global learning along a K-20 continuum. Specific advice to others includes serving as the "connector" of many different stakeholders to bring together a beneficial learning experience. It is not enough to simply globalize the content of the course by providing global examples. Morgan and King (2013) suggest that agriculture instructors to apply experiential learning instruction in developing global agriculture experiences which combines the experience, perception, cognition and behavior (Kolb, 1984).

Costs

Supplies	**Cost**
Instructional Materials	$145
Food Related Items (including India Buffet)	$700
Hunger and Hope: *Escaping Poverty and Achieving Food Security in Developing Countries* (Course text)	$700
Total:	$1545*

***Note: Funds provided by an internal college grant process**

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Closing the Distance in Distance Education: The Use of Video-recorded Feedback to Enhance Student Understanding

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Closing the Distance in Distance Education: The Use of Video-recorded Feedback to Enhance Student Understanding

Need for Innovation

Online education has become a popular method for universities to increase students' access to education; freeing educational courses of the boundaries of geography and time enable nontraditional students to engage in university-based studies (Coldwell, Craig, Paterson, & Mustard, 2008; Hoskins & Hoff, 2005; Moore & Kearsley, 2005). However, due to the self-directed nature of asynchronous online courses, students must be self-regulated and independent (Abrahamson, 1998), traits which are not found in all students enrolling in online courses. One of the most prevalent complaints students have about online courses is the "confusion, anxiety, and frustration due to the perceived lack of prompt or clear feedback from the instructor" (Hara & Kling, 2001, p. 68). While faculty members are well-versed in providing feedback via rubrics, class discussions, and one-on-one meetings for their on campus students, these methods may not transfer well to the online setting. The use of video-recorded feedback can help online students feel more connected to the instructor, as well as provide them with clear, unedited verbal and nonverbal feedback on specific assignment components.

How It Works

While there are numerous methods available to produce video-recorded feedback, the author will describe the methods used in an online graduate-level Research Methods course. The course is offered through the Blackboard course delivery system at [University], which gives all faculty members free access to Kaltura, a video-recording program that automatically uploads to the Blackboard system. During the most recent delivery of the course, the instructor provided video-recorded feedback for each student each week on his or her semester-long project. The Kaltura system allows the instructor to simultaneously record the computer screen and him/herself, allowing the student to not only view exactly what component of the project the instructor is responding to, but also view the nonverbal cues and full, unedited feedback of the instructor. These video recordings were then uploaded to each student's assignment, as a rubric with feedback would traditionally be uploaded.

Results to Date

Feedback from students regarding the video-recorded feedback was unanimously positive:

"I did like the feedback in the video version. It seems like that might be more time consuming for you but I found it helpful hearing your thoughts about each of the areas with you problem solving through as you went."

"[The video feedback] really gave me the 'full view' that the written feedback couldn't give."

"I absolutely <u>love</u> your video feedback on the the prezi's, and hope that you continue doing them! Since it is a project with a large amount of confusing components, it is really helpful to hear you go through each component and determine what is great and what needs a lot of work."

“I think the video feedback is great. Your questions helped me understand each component and I am able to reply the video and take notes as many times as I need to. Hearing and seeing your response is very helpful to me because I tend to be a better learner when I view your expressions rather than reading your response.”

Further, students’ edits to their projects were more accurate than they had been in previous semesters, with more students making appropriate corrections. Finally, the instructor perceived that students felt more connected to [him/her], as [he/she] received an increased number of communications from students asking for informal feedback on their ideas before their edits were made, suggesting the students were able to confidently apply feedback to their projects and felt comfortable sharing their ideas with the instructor on a regular basis.

Advice to Others

Some instructors may be hesitant to employ video-recorded feedback due to perceptions of the time requirements. This instructor found that, when used to provide feedback on a complex assignment, the video-recorded feedback was no more time consuming than providing written feedback, and enabled the instructor to more fully convey critiques and recommendations. Further, the video-recorded feedback allowed the instructor to focus more on the critique of the assignment rather than on directing the student to the component within the project requiring correction. However, the video uploading process did require more time than the uploading of a written document. The instructor overcame this problem by utilizing two laptops - while one video was uploading, the instructor used the second laptop to record another feedback video. While this method was more complex than the simple completion and uploading of a written rubric, the improvement in the quality of students’ work and their increased levels of satisfaction regarding their feedback throughout the course was deemed by the instructor to be sufficient justification for the continued use of the method. Instructors are suggested to evaluate the complexity of the assignment in order to determine whether video-recorded feedback would be more valuable than written feedback, as simpler assignments may not require video-recorded feedback in order for students to fully understand their performance.

Resources Needed

While the Blackboard and Kaltura systems are not available to everyone, each university has its own online course delivery system, most of which include video-recording and screen capturing capabilities very similar to those used here. Instructors are recommended to reach out to their online education specialists to gain access to and understand how to operate their university’s video-recording tools. Additionally, the instructor will need a webcam and microphone. Because of the availability of this technology within universities offering online courses, no additional funds should be needed. Depending on the system used, extended uninterrupted time may be desired; however, the Kaltura system includes a “pause” function during recording, allowing the instructor to record videos in piecemeal fashion if needed.

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Poster Type: Innovative

Common Ground: Why Should University Faculty Partner with Virginia Cooperative Extension?

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Common Ground: Why Should University Faculty Partner with Virginia Cooperative Extension?

Introduction/Need for Innovation

The answer to the question posed in the title is not necessarily an easy one. However, nothing is more impactful than university faculty using the tripartite mission of discovery, learning and outreach to impact people and their communities. University and Extension faculty, volunteers, associations, and students have wonderful opportunities to partner through applied research projects and educational programs that foster positive changes in lives of Virginians. Yet, as stated by Keith Smith, et al., in reviewing George McDowell's book, McDowell places land-grant universities at the center of the question, "How will the university of the future serve a public who has unlimited access to unlimited amounts of information?" McDowell's thesis: "Without greater engagement of the universities with the society, the public universities are in peril. Without that engagement, not only will the universities not be able to contribute to the pressing problems of the society, they will not be able to understand or renew the evolving culture, accurately or effectively interpret history, or significantly expand the understanding of the human condition" (McDowell, p. 26-77). As one contemplates the future of land-grant universities and the role of extension in their outreach activities, McDowell proposes engaging more parts of the universities under extension as one strategy for broadening the extension portfolio. McDowell provides scenarios from universities and/or extension services to illustrate how some have implanted new organizational or administrative structures or are experimenting with new programming or new types of partnerships. Further, in his Justin Morrill Lecture presented at the National Association of State Universities and Land-Grant Colleges annual meeting, Martin Jischke, Purdue president, states: "the idea of the engaged university is very powerful, but has to be reconceptualized in a more modern way by: 1) broadening the extension and outreach missions beyond agriculture, veterinary medicine and family and consumer sciences; 2) connecting student learning to the engagement mission, and 3) broadening the research agenda to be more interdisciplinary and problem-focused".

Common Ground and its subsequent action implementation plan is a valuable tool that can be used by Extension agents, campus-based faculty and administrators to help colleagues "catch the vision" for aligning faculty research interests with Extension's programmatic needs, ultimately implementing many of Jischke and McDowell's suggestions. Thus, Common Ground provides a strategy to articulate Virginia Cooperative Extension's (VCE) unique ability to leverage state, local, regional and national resources in order to deal with complex family, community and societal issues. VCE is Virginia's front door to bringing science-based programs and curricula to local communities and strives to build health, wealth, and connectivity through collaboration with state/local agencies, non-profits, foundations, and businesses.

How it Works/Methods/Steps

The Common Ground Action plan provides implementation guidelines that can be followed by faculty and administrators as well as students and volunteers. The guidelines include suggested action steps for administrators and faculty at all levels. They also provide potential outcomes which articulate the benefits of developing new partnerships and collaborative ventures.

Results to Date/Implications

To date, the Common Ground concept has facilitated partnerships between Extension Family and Consumer Sciences and faculty with non-extension appointments. These partnerships have resulted in successfully competing for a NIH grant to develop a Dining with Diabetes program; a CYFER grant to do intergenerational programming and develop a program entitled "Fit Extension", a behavior change program incorporating exercise and healthy eating.

In addition, other departments within Virginia Tech's College of Agriculture and Life Sciences have developed department specific applications of Common Ground. These departments include: Human Nutrition, Food & Exercise; Agriculture Leadership and Community Education; Agriculture Economics; and Horticulture.

Implications: Common Ground calls for visionary leadership in leveraging the resources of Extension and the land-grant system. Partnering with VCE strengthens existing partnerships and builds new relationships. For example, VCE's Extension agents, research faculty, program assistants, volunteers and students work together to strengthen families, youth and farms in Virginia communities by helping them develop essential life skills. Through this integrated partnership process, VCE:

- Identifies critical community and agency issues;
- Develops science-based solutions; and
- Provides education that positively impacts the lives of Virginia's families and youth

Future Plans/Advice to Others

In order to position the land-grant institution and extension for future sustainability, it is important to identify the research interests of all faculty and align those research interests with Extension's programmatic needs. Doing so is win-win and helps stakeholders understand the public/private value of research, education and outreach in terms of equipping constituents from all walks of life to develop essential life skills. Thus, equipping administrators, agent/specialist faculty, volunteers, and students to be prepared to answer the question: "Why should an agency, foundation or corporation partner to support Virginia Cooperative Extension Programs" must be a continuous process and part of everyone's job.

Partnership Outcomes

Common Ground illustrates and communicates the unique strength and public/private value of the Land-Grant system and Extension to stakeholders. It also fosters an invaluable, strong, viable network, allowing us to focus on important societal issues, such as protecting the environment, creating a safe/affordable food supply, promoting nutrition/health, encouraging youth development and community viability, sustaining agriculture, and finding new energy sources.

Costs/Resources Needed

Communication and marketing resources were engaged to design the Common Ground document and action plan. There were also internal time and effort costs associated with identifying faculty to provide partnership examples related to research, teaching or outreach.

Next step: market Common Ground to faculty and administrators as a tool to position the land-grant system and Extension for future sustainability.

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Creative Use of Technology to Encourage Human Connection and Increase Ag Literacy: #AgItForward

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Creative Use of Technology to Encourage Human Connection and Increase Ag Literacy: #AgItForward

Introduction / Need for Innovation

Networking and face-to-face communication is critical to facilitating human connection. Each year approximately 60,000 students from across the country attend the National FFA Convention (The National FFA Organization, 2014) and have the opportunity to make these connections. These fortunate students are able to see how the FFA, and agriculture in general, vary across our nation. They are able to establish relationships with other members, chapters, universities, and industry professionals. Unfortunately, less than 10% of FFA students will have this opportunity (The National FFA Organization, 2014). Students now rely heavily on social media to gain information about FFA and to create relationships with students across the country

One of the goals of the National Research Agenda (Priority Area 2) is to increase the use of new technologies and social networking for communication to target audiences (Doerfert, 2011, p.17). Many school districts have policies that restrict the use of social media networking sites (Williams, Warner, Flowers, & Croom, 2014). However, it is apparent that both secondary and postsecondary students are increasingly adopting applications like Instagram for online communication. Faculty and students use social networking in similar ways (Caldwell, 2015). However, Murphrey, Rutherford, Doerfert, Edgar, and Edgar (2012) found that students do not recognize the educational value. Bumguardner, Strong, Murphrey, and Dooley (2014) indicated a similar perception about the educational benefits of blogging. This project illustrates one way to leverage student interest in social media for educational purposes in a manner consistent with the National Research Agenda.

This project, entitled "#AgItForward," was created to give FFA members the opportunity to make human connections, become more literate about agriculture and form meaningful relationships with members across the country by utilizing both traditional and online communication tools. Approximately 72% of American teens use social networking (Bowen, R.D., Stephans, C.A., Childers, C., Avery, E.J., Stripling, C.T. (2013) and its use continues to increase. However, few students are familiar with the process of traditional post mail correspondence or formal letter writing. This project blends new, popular forms of social media with traditional, post mail pen pal methods to expand the reach of participating FFA chapters by leveraging the connective power of social media. Activities promote public support of "agriculturally literate people making personally informed decisions about agriculture related topics" (Doerfert, 2011 pg. 12) by engaging individuals in asynchronous conversation.

How it Works

Traditional pen pal methods were combined with popular social media in the form of Instagram, Facebook, and Twitter. Participating FFA chapters are required to send formal letters to two other chapters to initiate a pen-pal relationship and spark interest in the program. Recipients send letters back to their pen pals and at least two additional schools to further increase participation. Chapters that choose to participate can use Instagram to facilitate widespread, rapid communication targeted at all other participating chapters.

Initially, an Instagram account and informational website were developed. The website provides participating chapters with information, templates and instructions to complete formal letters. It also provides links to a survey site used to collect information about each chapter. To begin the process, San Luis Obispo FFA (California) mailed letters to each state officer team in September 2014. The Chapter also prepared a video clip and Instagram post to help students develop their own Instagram accounts to promote their chapters.

Once a school receives a letter, their first step is to print out the logo sheet, two instruction pages and two blank letter templates. Next, they plan and complete a community service project. They take a photo of themselves during the project, and include the #AgItForward 'logo'. They upload this photo to their chapter Instagram account and include #AgItForward. Instagram uses the hashtag (#) symbol to organize these posts into a group of photos that can be searched by students and FFA advisors. The photo is also mailed back to the school that sent them their letter with the signed logo sheet. This photo is included in two new letters mailed to the schools assigned in the original letter. One of letters sent is sent to a chapter in their state and the other is sent to a chapter out-of-state. #AgItForward chair reposts the same photo and description of the event along with key information taken from an online survey.

Results to Date / Implications

Currently there are 1,090 followers to the #AgItForward account. Six state officer teams and forty-six chapter officer teams that have completed the process. The geographic extent of participation ranges from Alaska to Puerto Rico and Hawaii to New York. California Polytechnic State University, San Luis Obispo served as the first collegiate FFA program to complete the process. Several middle school FFA programs also follow the Instagram account. In October 2014, a Facebook page was also set up to promote this site to primarily the older generation and community members not on Instagram**.** Further, the National Association of Farm Broadcasting with FFA News and RFDTV conducted a radio interview on January 20, 2015 with the project leaders to share the success and promote the project.

Future Plans

A new collegiate version will allow their programs to promote their schools to numerous high school students across the country. The information provided will help promote possible agriculture majors and career choices in agriculture. A new addition to the posts are 15 second agriculture literacy soundbites titled "#AgInOurArea." All schools following @Agitforward are invited to video tape a 15 second clip about agriculture in their community to upload to the #AgItForward instagram site. They can also provide additional information below the video clip. This provides students a chance to practice public speakings skills, connect with their community, and inform other about agriculture in their area. There have been 25 videos posted.

Costs / Resources Needed

Costs to implement the project were minimal with initial start-up costs related to supplies (i.e., letters, envelopes, mailing labels, and stamps) costing approximately $100. The wix.com website, Instagram and Facebook are free. Resources included time, smartphone/computer, and engaged students. Instagram is a free mobile application available to anyone with a smart phone and data plan.

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Innovative Poster

Cultivating hybrid vigor for innovation in school-based agricultural education through online professional development episodes

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Cultivating hybrid vigor for innovation in school-based agricultural education through online professional development episodes

Introduction/need for innovation or idea

Several studies have shown that professional development that addresses discipline-specific concepts and skills has been shown to both improve teacher practice, as well as student learning (Blank, de las Alas & Smith, 2007; Cohen & Hill, 2001; Saxe, Gearhart, & Nasir, 2001). Teachers themselves report that their top priority for professional development is learning more about the content they teach, giving high marks to training that is content-specific (Darling-Hammond et al., 2009). Because the growth of knowledge, practices, and technology in agriculture education are continually and rapidly evolving, programs focusing on professional development for teachers must provide teachers with up-to-date, adequate, and in-depth opportunities to learn and collaborate on school based agriculture education total program operation and innovative practices. Professional development opportunities for educators today are still relatively limited to seasonal workshops and conferences. While this can be the preferred model for district administrators when looking at continuing education requirements, agriculture education teachers welcome ways to replace that of traditional ongoing professional learning opportunities. To provide the agriculture teachers of Pennsylvania with unique web-based professional development programs, the Penn State University Center for Professional Personnel Development sponsors two online webinar series that occur once a month during the fall and spring semesters. The webinars provide convenient, flexible options for agriculture educators, also making teaching and learning possible any time and in any place.

How it works/methodology/program phases/steps

The webinar series was established to offer Pennsylvania agriculture teachers, Penn State University Agricultural and Extension Education majors, and Pennsylvania Association of Agricultural Educators members the opportunity to engage in two uniquely designed online professional development opportunities focused on the total agriculture education program and highlighting the work of outstanding agricultural educators from across the nation in innovation of program delivery. *"Thursday Technical Updates"* is a webinar series put on once a month on a Thursday for an hour in the afternoon via Adobe Connect. The presenter is asked to spend 30-45 minutes discussing one component of the agricultural education program in which the webinar is focused and the remainder time answering questions and engaging in collegial, collaborative discussion. The series was designed to address the total agricultural education program providing a webinar for each component each semester. Content presenters are Pennsylvania agriculture teachers who have shown exemplar contributions in the area of SAE, FFA, and classroom instruction.

The "*Teach Ag! Great Teacher Chat"* webinar series' primary goal is to harness new distance technologies to allow for current Pennsylvania agriculture teachers, Agricultural and Extension Education (AEE) majors, Association of Agriculture Educators to expand their professional network to include outstanding agricultural educators from across the nation by participating in a monthly chat session about programmatic philosophy in delivering the total agricultural education program. A secondary goal is to allow innovation in program delivery in Pennsylvania by promoting the sharing and exchange of ideas among current agricultural educators who are members of the Pennsylvania Association of Agricultural Educators with these dynamic agents of change from other locales. [i.e. HYBRID VIGOR].

Presenters for the "*Teach Ag! Great Teacher Chat"* are Agriculture teachers who have been recognized for their outstanding contribution by professional organizations related to agricultural education (ACTE, NAAE, National FFA, etc) to spend 30-45 minutes discussing their professional outlook and the remainder time answering questions from participants. The series occurs once a month on a Monday for a total of an hour. Both programs occur via Adobe Connect hosted by faculty in the Penn State University Agricultural and Extension Education Teacher Preparation Program. Webinars are archived for future instructional & professional development use with access to digital archives being provided to Pennsylvania Association of Agricultural Educators members. Previous speakers/presenters are also invited to attend future webinars if they wish!

Results to date/implications

Professional development via online webinars has created a new model for professional development for Pennsylvania agriculture teachers. Developing online professional development webinars has advanced opportunities for teachers to witness the practice and reflections of their colleagues in agriculture education within and outside of Pennsylvania. The faculty faces challenges in presenting the webinar series during a time convenient for all teachers. Attendance varies due to scheduling conflicts, topic relevancy to individual needs, or individual comfort utilizing technology. The webinars are recorded and teachers are provided a link to visit, however, the faculty cannot track how often the links are visited. Teachers have expressed their appreciation of the content shared and its applicability to their programs. Presenters have included agriscience teachers from California, Idaho, Louisiana, Ohio, Oregon, New Jersey and Pennsylvania Example Topics include: Using The Ag Experience Tracker (AET) Online Recordbook ; Best Practices for National FFA Convention ; Exploring Small Animal Health Careers for your students ; Meeting the Needs of Diverse Populations while utilizing Land Labs ; Personal Professional Development: What is your plan? Engaging the community in discovering student success for student with special needs Technology in Agricultural Education & Middle School Programs; Engaging School & Community in FFA Activities; and Industry Partnerships with large CTE program

Future plans/advice to others

Future plans being considered by the host faculty is to implement more evaluative methods of the presented webinars on participants' perceptions about the changes in their knowledge, skills, and practices. Future plans are to also collect more data from agriculture teachers on their specific needs/wants to determine presentation topics. The host faculty are also considering utilizing the NAAE National Workshops to guide selection of teachers to present. Advice to others who may wish to develop a similar platform for professional development would be to identify the topics the webinars will be focused on, and then utilize the US AG ED list serve to solicit volunteers to present.

Costs/resources needed

Costs are minimal and mainly fall into the time category for organizing and facilitating the webinars. Presenters need to be contacted well in advance to determine webinar date and allow for ample preparation time. The faculty member's time is used to conduct the actual event. The webinar series are offered online to Pennsylvania agriculture educators and may be accessed free of cost. The recorded webinar is archived and shared over the state list serve, access to the recorded webinars is based on membership to the Pennsylvania Association of Agricultural Educators.

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Innovative Poster

Cultivating self-directed learning: Early Field Experience Reading Program for Teacher Candidates

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Cultivating self-directed learning: Early Field Experience Reading Program for Teacher Candidates

Introduction/need for innovation or idea

Student personal and professional development is an area of increasing importance in teacher education preparation programs. The practitioner of the future needs to be able to reflect and self-assess his/her learning in order to take intentional steps toward developing and improving their teaching competency. Many view the development of reflective practice as the foundation for the highest professional competence (Cole & Knowles, 2000; Jay, 2003). Hatton and Smith (1995) define reflective practice as the use of higher-level thinking, such as critical inquiry and metacognition, which allow one to move beyond a focus on isolated facts or data to perceive a broader context for understanding behavior and events. In order for agriculture education student teacher candidates to develop a reflective mindset, the (State University) Agriculture Education teacher preparation program has implemented a summer reading program for the incoming student teacher candidates. To encourage thoughtful and balanced assessment of their selected readings, students are required to submit a reading reflection. The program is designed to actively involve the student in his/her education by writing self-reflective blog posts throughout the summer focused on the reading text selected. Through this program, students will apply higher-level thinking to broaden their understanding of teaching practices. The purpose of the Summer Reading Program is to also provide teacher candidates with "food for thought" as they embark on their preservice professional development, specifically addressing dispositions of successful educators and stimulate the teacher candidates informed opinions about ideas presented in the text and to consider how they affect their interpretation. Reading reflections offer an opportunity to recognize – and perhaps break down – the teacher candidates' assumptions, which may be challenged by the text(s).

How it works/methodology/program phases/steps

The incoming student teacher candidates are required to take an early field experience course the fall of their senior year. The students are provided a list of texts that center on educational practices, educational research, teaching inspiration, practical teaching techniques, and innovative ideas for teaching. Students are required to select a text prior to the end of the spring semester of their junior year. The course instructor must approve the selected text. The assignment associated with the reading program is for students to read the text in stages and post reflective blog posts. Along with posting their own blog posts, teacher candidates are required and encouraged to read and comment on their peers reflections to foster conversations to expand their knowledge, skills, and dispositions. The first third of the book is to be read by the middle of June. A reflective blog post on the first third of the book must be posted to the teacher candidates dedicated NAAE Communities of Practice sub-space, where they post comments on their peers' posts. The second third of the book is to be read and reflected upon by the middle of July. Again, a reflective blog post must be uploaded and thoughtful responses to their peers' reflections are required. The final third of the book is to be completed and reflected upon by the middle of August. As required for the other two reflections, students must post their reflective blog post and comment on their peers' reflections as well. A final blog post is required to be posted by the first day of the governing class. The final reflection encourages students to reflect on the entire reading and answering the question, "How is/has this reading going to impact me as a teacher?" The final reflection is posted on the NAAE Communities of Practice sub-space and teacher candidates post comments on their peers' reflections. Teacher candidates receive points based on their timeliness, quality, and fulfilling all requirements. The course instructor posts comments to all students blogs to provide feedback and encourage more reflective thought.

Results to date/implications

The reading program began with a predetermined text selected by the course instructor, *The Courage to Teach* by Parker Palmer. However, student feedback revealed students preferred to have the option of selecting their own text. A suggested reading text selection list was created and provided to students to review that included title, authors, brief description, and a web link of texts deemed appropriate for the assignment. Students have been receptive of the change. The blog posts have provided students the opportunity to familiarize themselves with the NAAE Communities of Practice website and navigate the site successfully. The goal of uploading reflective blog posts to have students expand their thinking beyond the texts and perceive a broader context has been underwhelming. The course instructor has seen that many students lack deep reflective thought beyond regurgitating the text contents. The instructor also faces the challenge of tardy submissions.

A current 2015 teacher candidate and her cooperating teacher decided to read the selected text, *Lean In: Women, Work and the Will to Lead* by Sheryl Sanderg, together. As a result, the cooperating center's FFA is hosting a stakeholder meeting to gather visionary women together to take action to empower the next generation of female leaders. The book inspired the cooperating teacher and the teacher candidate to create a Lean In Circle during the school year that will meet monthly to connect influential women with the school's female students to share life experiences, open eyes to unthought-of opportunities, and drive a cultural shift in young female minds. The two are currently planning a meeting for the Lean In Circle Advisory team to shape the program for the 2014-2015 year.

Future plans/advice to others

Future plans are to continue the summer reading program/assignment. Since its inception, a new text that offers great information and is written with unique style has emerged as a text that may benefit all teacher candidates. The Agriculture Education teacher preparation instructional team at (State University) will review the text and consider removing the option of selecting a text and assign the specific text, "*Teach like a Pirate: Increase student engagement, boost your creativity and transform your life as an educator* by Dave Burgess. The instructional team is also evaluating the pros/cons of providing guiding questions for their reflective posts.

Costs/resources needed

Each teacher candidate is responsible for obtaining his or her selected text for the assignment. The cost incurred differs depending on format in which they purchase, whether it be the actual book or digitally. The cost, however, can be avoided if students borrow from the university library. Each student must also create a profile on NAAE Communities of Practice to access the respective sub-space created for their teaching cohort.

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Innovative Poster

Developing pragmatic research consumers through action based research project in agricultural education teaching internships

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Introduction/need for innovation or idea

Reflection is of vital importance to the teaching process (Buehl & Fives, 2009; Canning, 1991). At the preservice level, this habit of mind is cultivated through the coursework at the university and through conversations held with cooperating teachers in whose classrooms the preservice teachers are placed. The necessity of critical reflection in teaching situations also requires that teachers have, as a habit, the ability to gather relevant data to better understand the nuanced differences for practices that work versus those that do not and the reasons for each, for this is how knowledge and experience through the art of teaching are created (McNiff & Whitehead, 2010). To help develop critical reflection in student teachers, the addition of action research can be a means to cultivate such practices. Deemer (2009) reports that students utilizing action research projects as a component of their classes experienced a better appreciation and understanding of methodically exploring a variety of issues related to education. Taking the approach of action research means that there is a structure and plan in place for the manner in which student teachers will gather their information, analyze it, and develop subsequent action plans. Depth of understanding is the end goal for anyone hopeful of being highly effective in the classroom. This is a fundamental and necessary component that the experience of student teaching should offer future teachers through the cooperating teacher's classroom (Weasmer & Woods, 2003).

How it works/methodology/program phases/steps

Student teachers at Penn University conduct their student teaching internship during the spring semester of their senior year. During this internship, student teachers are required to complete a series of assignments that will assist in their development as an educator and consummate professional. Developed to enhance reflection and understanding, an Action Research Project was designed and implemented into the internship. In addition to learning how to conduct Action research, major components of the Action Research Project was to provide opportunities for student teachers to identify targeted students, develop a plan to improve student achievement, implement the designed plan, and observe and describe the effects of the plan, documenting the effects on student performance. Additional objectives of the Action Research Project were to 1) Utilize multiple sources such as journals, lesson plans, examples of student work, and checklists. 2) Engage in personal reflections about the plan, its implementation, teacher behaviors, student behaviors, and the effect or lack of effect on student achievement. 3) Share results with AEE instructional faculty/staff and cohort through a poster presentation.

Teacher candidates were provided an assignment description that clearly outlined the purpose of the project. A short presentation was provided by a member of the faculty instructional team to define Action Research and articulate the objectives and desired outcomes of the assignment. Along with the assignment outline, students were provided four worksheets that would help facilitate and guide the Action Research Project. Teacher candidates were required to begin the Action Research process fairly early in their internship, working with their cooperating teacher to investigate classroom concerns and identify a classroom problem or area of change. Candidates were expected to share their proposed project to the faculty instructional team by a predetermined deadline. This allowed the faculty instructional team to measure candidate and cooperating teacher comprehension of the assignment, as well as keep students on schedule to collect and analyze data prior to the completion of their internship. Teacher candidates were encouraged to utilize the provided worksheets that assisted in identifying a classroom problem, developing an Action Research Plan, and designing an implementation. Completion of the provided worksheets and a final Poster Presentation were the items evaluated for credit. A reflective blog entry solely on the Action Research Project at the end of the semester was also evaluated for student to receive full credit.

The poster presentation was assigned as a way in which each teacher candidate could present their respective project. The posters were created in PowerPoint. The poster dimensions could not exceed 24 inches x 24 inches. The student was responsible for creating, printing, and bringing the poster to the Post-Internship Seminar held on Penn State University campus. The poster included the teacher candidate's problem statement, implementation schedule, a short narrative on how the problem was identified, the action research plan, implementation, data, results, and solutions. Posters were displayed at the Penn State University Teach Ag! Banquet!

Results to date/implications

Following the first year of implementation at Penn State University, the Action Research Project has proved to challenge and stretch the teacher candidates. Teacher candidates recognize the importance of communicating openly with their cooperating teachers to assist in identifying a classroom problem to research. The Action Research Project has promoted deep reflective thought by teacher candidates on classroom environment, student behavior, and teaching strategies. Teacher candidates and cooperating teachers have expressed frustration with not fully understanding the purpose for the assignment in and of itself. The faculty instructional team has provided coaching on the assignment individually and through online professional chats. Teacher candidates have also expressed distress when designing and preparing the final poster.

Future plans/advice to others

The mixed feedback from the teacher candidates of its first year being implemented indicates that some work needs to be done of the faculty to articulate the need and importance of the project. The Action Research Project will be utilized in future years with more time devoted to presenting examples of Action Research projects that have been conducted by in-service teachers. A recommendation would be to invite an in-service teacher who is confident and successful in conducting Action Research to present to the teacher candidates. In addition, teacher evaluation process in [state] are evolving to require teachers to complete a "Student Learning Objective (SLO) Form". Feedback from cooperating teachers indicates that the action research process aligns with SLO process which will increase felt need in candidates.

Costs/resources needed

The main cost associated with the Action Research Project was the cost of the final poster. This cost is absorbed by the teacher candidate. The teacher candidates should estimate a total cost of between $30 - $50. A large amount of time was also allocated to designing, instructing, and coaching the Action Research Project for the teacher candidates by the faculty instructional team. Following the summation of the student teaching internship, the faculty instructional team met to evaluate the experience and make adjustments for the upcoming year.

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Innovative Idea Poster

Do It For The Vine: Micro-vlogging for Review and Reflection in an Introductory Agriculture Course

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Do It For The Vine: Micro-vlogging for Review and Reflection in an Introductory Agriculture Course

Introduction/Need for Innovation

The integration of Internet technologies in the classroom continues to grow and has a positive impact on student's college academic experiences (Jones, 2002). As these technologies, including social media, continue to grow and improve and access to these technologies increases, it can be beneficial for university faculty to harness these technologies in the classroom (Dunlap & Lowenthal, 2009). A Pearson Education study found that 83% of college students regularly use a smartphone (2014). This finding opens up another avenue of technology that university faculty can utilize in the classroom.

At Fort Hays State University the Animal Science (AGRI 111) course is currently offered in a three hour lecture format without a laboratory component. Without this laboratory component, students receive less hands-on experiences and thus the learning experiences of visual and kinesthetic learners can be hindered. An innovation was needed to help increase hands-on learning experiences for students without taking away from in-class lecture time.

Vine, a micro-vlogging application available on smartphones, was chosen for students in AGRI 111 to document their out-of-class learning experiences. "Micro-vlog posts are a way of sharing short bursts of information, the visual/audio version of 140 characters" (Merritt, 2013). Students were encouraged to utilize the University farm and staff as well as their own farms and ranches to document their understanding of course topics throughout the semester. These *Vine* videos were then available throughout the remainder of the semester to be utilized for review and reflection of course content.

How it Works/Methods/Steps

Vine is a free application available on *Android, iOS,* and *Windows* smartphone platforms (vine.co, 2015). This application allows users to create and edit six-second videos and share them online through the application. The first step is having students download the free application and set up an account if they are not currently a user of the application. If all students in the course do not have access to a smartphone, grouping students may be necessary to ensure participation capabilities.

For this specific innovative idea, students in AGRI 111 are required to create five *Vine* videos throughout the course of the semester. Each video must depict current topics being covered in the course. The students receive a grade for their videos based on video quality, originality, and accuracy of information delivered in the video.

Like the microblogging application *Twitter, Vine* utilizes hashtags. A hashtag is "a word or phrase preceded by the symbol # that classifies or categorizes the accompanying text" (Merriam-Webster's online dictionary, n.d.). In this innovative idea, students were additionally required to utilize three hashtags as well as a description when posting their *Vine* video. Two of the hashtags were more general, thus allowing for those looking for University related information and agricultural related information to find the videos created by this course while the other hashtag was course specific. The course specific hashtag made the grading process easier because all videos were grouped together in one location through this hashtag.

Results to Date/Implications

Vine was utilized in AGRI 111, an introductory agriculture course in the Fall 2014 semester. This course is comprised of 14 freshmen and 8 sophomores. The entire course is offered through a face-to-face delivery method in a traditional classroom and does not have a laboratory component. The instructor introduced the innovative idea early in the semester to allow students the opportunity to download the application, become comfortable with the program, and to brainstorm ideas. Additionally students were divided into pairs to work together throughout the semester, as two students did not have access to a smartphone.

The first due date was assigned and students had the choice of any topic covered up to that point of the semester to utilize as the topic for their *Vine* video. Additionally, the instructor posted a sample *Vine* video as an example for the students. On the due date of the assignment, students complete peer participation evaluations, which factored into their grade for the assignment. This process continued for five total *Vine* videos per team throughout the semester.

At the conclusion of the semester a survey was distributed to assess students' perceptions toward *Vine* in the classroom. A majority of the students liked the idea of using social media in the classroom and enjoyed doing the videos in teams rather than alone. When asked to rank the usability of the application, 77% of the students said the application was easy to use. While a small number of the students utilized their own videos as well as the videos of other students for study purposes, the majority chose not to use this study method. Seventy-two percent of the students felt that *Vine* should remain a part of the course in future semesters.

Future Plans/Advice to Others

Future plans for the use of *Vine* in AGRI 111 include the addition of requirements such as the use of live animals and actual production processes in two or more of the *Vine* videos throughout the semester. Students will be able to utilize the University farm and staff to aid in these requirements if they do not have access on their own family farms or ranches. These additional requirements could better provide for greater student understanding of the course content since this course does not have a laboratory component. It is advised to monitor peer participation throughout the semester and reassign groups if the need arises to ensure equal participation within teams.

Costs/Resources Needed

Vine is a free application available to *Android*, *iOS*, and *Windows* smartphone users. With an ever-increasing number of students who own a smartphone, most students already own the required resource that is needed. While it is advised that the instructor have a smartphone, it is not required as *Vine* videos are viewable online, therefore evaluations can be conducted on a personal computer.

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Poster type: Innovative

Engaging international student organizations to develop global competency in students of agriculture

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Engaging international student organizations to develop global competency in students of agriculture

Introduction

In an increasingly globalized world, many university campuses have become progressively diverse. In the past 15 years, the number of international students on U.S. campuses has grown 72% (IIE, 2014). People who once lived on the other side of the world are now students on our campuses and in our classes. There are many studies that focus on the experience of international students on campuses, but very few studies focusing on the effect of international students on domestic students (Leask, 2009). Anecdotal evidence suggests that simply inhabiting the same campus and attending the same classes does not lead to meaningful interaction between domestic and international students. International students bring a diversity of perspectives to campus, which could be shared with domestic students to facilitate global learning; however, international students remain an underutilized resource on many campuses leading to continuing isolation of international and domestic student networks on many campuses (Williams and Johnson, 2011). Thus, the question remains, how can faculty facilitate significant and meaningful interaction between domestic and international students to advance learning and capacity for global agricultural issues?

Methodology/Project Phases

Faculty members from the <college of agriculture> at [NAME] University formed relationships with international student organizations through networking with international students majoring in agriculture. While there is difficulty at times in recruiting international student volunteers to participate in activities, long-term personal connections with international students and international student organizations have been found to be productive. Expressing a shared value in the importance of sharing diverse culture and perspectives with domestic students between faculty members and international students has led to an enthusiastic response in collaboration.

Instructors created a space within formal learning experiences to give international and domestic students the opportunity to interact. In an introductory orientation course designed for first year students in the major, a course session was designed with the following learning objectives: 1) Define intercultural communication 2) Discuss importance of intercultural communications in agricultural programming and 3) Apply intercultural communication skills. To accomplish the learning objectives, the instructors invited in members from two different international student organizations representing two different cultures to engage in “speed dating” with domestic students where each of the 21 students in the class were paired with an international student. Prior to the international student “dates” arrival, students brainstormed possible questions that would be appropriate to ask international students and defined acceptable behavior for the activity. Upon arrival to the class, international students were paired with enrolled students. To address potential anxiety, the “speed dating” intervals began with just two minutes and increased in length as the students grew more comfortable with interacting with each other.

Similar interactions have been facilitated in other classes, with varying goals depending on the course. In the Spanish for Agricultural Sciences program, the international students were brought in specifically to practice agricultural Spanish with domestic students. In embedded courses, international students from the target country have attended class to share information about their culture and country. International students have also been included in outreach events with global learning objectives. For example, [NAME] University hosts a summer program for secondary students investigating future careers in agriculture. During the international agriculture section of the course, a group of Malaysian women were welcomed into the class to teach the students a traditional agriculture dance honoring the rice harvest. The dance activity facilitated conversation between the participants, and gave the domestic students the opportunity a safe space in which to explore a new culture and a new language.

Results

Student feedback has been overwhelmingly positive. While some domestic students initially hesitant to engage in the activities, their uncertainty is quickly overcome once the activity begins. International students have commented that they “love to share their culture” with domestic students and are quick to volunteer for future activities. The logistics of finding willing international students to volunteer in activities is difficult as experience indicates international students are hesitant to come to an activity in a new environment, especially when it is facilitated by an unknown person. Some students are very shy about their English language abilities and are afraid of speaking in front of a large group. These challenges were overcome by networking and relationship building with individual students and international student organizations. This is a continual process as students graduate and new leadership is elected to student organizations on an annual basis.

Future Plans

Future plans for the integration of international students into <college of agriculture> activities are currently being investigated. A dedicated task force recently held focus groups with domestic and international students, as well as surveyed current administrative resources. There is interest in starting a co-curricular organization to facilitate non-formal interactions between domestic and international students. It should be noted that superficial contact between domestic and international students can induce negative feelings without adequate preparation (Jon, 2012). New activities should be approached with caution and trialed on a small scale.

Cost/Resources Needed

No costs beyond expected educational expense were incurred. Ideally, tokens of appreciation would be purchased to be shared with international student volunteers.

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Poster Type: Innovation

Evaluating the Usability of Websites: An Introduction to Heat Maps

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Evaluating the Usability of Websites: An Introduction to Heat Maps

Introduction/Need for Innovative Idea

While agricultural communicators are trained in developing communication materials to help communicate a message, often the communicator develops a communication material based primarily on their design preferences (Ann, 2014). However, communication materials, and especially websites, should be designed based on how the target audience uses the website and values the information they find on the website (Ann, 2014; Dimas & Redish, 1999).

Usability testing is an evaluation technique measuring how easy a target audience member can learn the information on the website and then make use of the information on the website to accomplish a task (Dumas & Redish, 1999; Goodwin, Davis, & Telg, 2014). These tests evaluate users' perceptions of ease and value in order to find out the usefulness of the website and the potential improvement that could make the website more effective and efficient to both stakeholders and the public (Dumas & Redish, 1999; Goodwin et al., 2014; Rubin & Chisnell, 2008). One way agricultural communicators can measure the usability of their websites is by using heat maps embedded in online surveys. In an online survey, a heat map, or image of a webpage, can be presented to the respondents with a heat map question. The question can request the respondent click on the webpage image to determine numerous usability functions (Qualtrics, 2014a). The researcher can also record how long the task takes to complete in order to figure out the degree of functionality associated with the website (Qualtrics, 2014a). The importance of this innovation is that heat maps allow researchers to gather information and determine the ease of use of the website for respondents. Researchers can use this information to improve communication strategies targeted toward website use and value. This innovation meets research priority 2 of the National Research Agenda, New Technologies, Practices and Products Adoption Decisions as it aims to determine the usefulness of systems that facilitate the decision-making and adoption process by individuals and groups (Doerfert, 2011).

How it works

This methodology works inside an online survey platform such as Qualtrics, AirMagnet Survey, and SurveyGizmo. Using the heat maps in Qualtrics as an example, the first step is to develop an audience based research question to evaluate how well the user finds information. For example, questions may include the following: please click on the area where your eye went first when you looked at the page, or please click on the area where you are most likely to go for more information. In this step, screen shots of the webpage should be taken and be included in the question.

When using Qualtrics, the researcher would select heat map as the question type. After the question type is selected, select the "choose graphic" button to upload the webpage screen shot into the survey (Qualtrics, 2014a). In this step, the survey question should be added in the question box, such as "please click on the area where your eye went first when you looked at the page." In this step, the researcher has the option to select how many clicks are allowed for the respondents to make on the image. If "1" is selected, even though the respondent may click more than once, only the first click will be recorded (Qualtrics, 2014a). In order to evaluate how long it took the user to find the information, a timing question should be added to the survey. A timing question should be added directly before the heat map question to record how long a respondent takes to click on a page and how long a respondent spends on a page (Qualtrics, 2014b). This question will be hidden from respondents. In order to evaluate the value of the information on the website, other questions should be included in the survey to evaluate the user's perceptions. For example, respondents could be asked their level of agreement on a scale from 1 = *Strongly disagree* to 5 = *Strongly agree* with statements about how they value elements on the website, such as navigation, color scheme, and information. The researcher can add regions to the webpage screenshot image. Custom region shapes can be drawn around certain areas of the image (e.g. logos, links, navigation bars) before or after the respondents complete the survey. Additionally, these regions can be altered based on responses.

Data will be recorded as the respondents complete the survey. In survey reports, a heat map image will be created displaying where the respondents clicked on the image (Qualtrics, 2014a). Once regions are defined, a table will be produced displaying the amount of clicks in each of the regions. Additionally, the timing question will collect four pieces of data: first click, last click, page submit, and click count for each respondent.

Results Using Heat Maps and Implications

This procedure was recently used in a study to evaluate the usefulness of a website. The website was designed to provide educational resources regarding invasive species transferred on agricultural products to international travelers. The study used heat maps to determine the usefulness of the website on mobile, tablet, and desktop computer platforms. The perceived value of the website was determined through questions about user's general perceptions of the website, perceived navigation experience, and perceived quality and quantity of information. It was found that respondents generally focused on certain website elements, such as buttons with larger text and highlighted objects. The results showed click timing varied between the three platforms, with desktop computers using the most amount of time for respondents to make a decision. These results show areas where communicators need to focus their attention to improve usability, such as emphasizing important areas with larger buttons, text, and highlights. Additionally, respondents took less time with the platforms that had less information on their webpages. While there is value in the information on the homepage, the homepage should be concise and simple to attract users to the most important place in a shorter amount of time.

By using a heat map as a tool to evaluate communication materials, communicators can understand how their target audience uses the information found in specific communication materials. By understanding how a communication material is used by a target audience, communicators can suggest recommendations or change the communication material to fit the needs of the target audience. Usability evaluation tools, such as heat maps, have the ability to improve communication messages and strategies between information senders and receivers; therefore, these usability tools can communicators to provide communication strategies and services that are more targeted to the usability needs of their target audiences.

Costs and Resources Needed

In order to use heat maps to perform a usability test, the researcher will need access to a website, access to an online survey platform such as Qualtrics, and access to respondents. Although there is no cost for these materials, a communicator may hire a company to distribute the online survey to a specific target audience to gain a specific amount of completed responses for a cost. The cost depends upon the demographics of the target population.

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Exposing Students to Laboratory Instructional Experiences in Agricultural Education

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Exposing Students to Laboratory Instructional Experiences in Agricultural Education

Introduction/Need for Innovation

According to Shinn (1987), the effectiveness of an agricultural education program is directly linked to the ability of the educator to teach in the laboratory setting. Unfortunately, the experience of students in agricultural education can be limited and may not reflect direct contact with food and fiber production (Leising & Zilbert, 1994; Seburn, Leising, Portillo, & Igo, 2005; Slusher, 2009). This trend suggests numerous pre-service teachers do not possess the technical subject matter knowledge and skills necessary to implement effectively the Agricultural Food and Natural Resources (AFNR) Career Pathways represented in school-based agricultural education. In Oklahoma, the primary career pathway is animal science; however, power, structural and technical systems and plant systems pathways are also popular choices among secondary students (Oklahoma Department of Career and Technology Education, 2013). Therefore, to equip pre-service teachers in the areas associated within these career pathways, the faculty at Oklahoma State University developed a course regarding the basic laboratory skills necessary to implement the common career pathways highlighted in school based agricultural education programs in Oklahoma.

Across the country, school-based agricultural educators have the unique opportunity to provide course instruction in a variety of settings. The location that often leads to hands-on instruction and application of material is the educational laboratory. Today, laboratories are an avenue for students to practice the content or skills taught in the classroom and apply those concepts to a real world situation (McCormick, 1994). Nationally, school-based agricultural educators report having the most access to a greenhouse and/or mechanized agricultural facilities (Shoulders & Myers, 2012) in their school setting. Agricultural educators across Oklahoma use these laboratory settings on a regular basis to complement classroom instruction (Franklin, 2008; Phipps, Osborne, Dyer, & Ball, 2008). As such, they should be able to employ the skills associated with each laboratory.

How it Works

The course is designed to promote skill acquisition and agricultural content knowledge in pre-service agricultural education teachers. A four-week *block* is utilized to complete two, three credit hour courses, a methods course and the laboratory management course. The *block* is held at the beginning of the student teaching semester, prior to the 12-week student teaching internship. The block experience exposes students to a variety of career pathways, i.e., power, structural and technical systems (metal and wood working), animal science systems (sheep, goats, equine, cattle, and hogs), and plant systems (greenhouse work and experiments). In addition, students create a mock Agri-Science Fair project. Class sessions are designed to feature a different career pathway, and assignments assess students' progress in the specified areas. Class sessions are held five days per week for a total of four hours each day.

Subject matter experts are identified by the course instructor and asked to facilitate a session that highlights a specific skill that supports a career pathway. Students engage in sessions via questions, and active participation in application activities, i.e., fitting and exhibiting livestock (cattle, sheep, goats, swine, and horses), driving and backing a pickup truck and gooseneck trailer through an obstacle course, propagating plants, designing a research project, and utilizing basic wood and metal tools to create a unique item from scrap wood and metal. All of these applications are related to the knowledge and skills needed to effectively implement the AFNR Career Pathways represented in school-based agricultural education programs.

Results/Implications

As a result of the four-week experience, pre-service teachers have a better understanding of the technical skills needed to be a successful agricultural education teacher in Oklahoma. Within each experience, student's role-played the part of the laboratory instructor. For example, each designed authentic rubrics for wood and metal projects in the agricultural mechanics laboratory. Each *teacher* had between 3 to 5 *students* for whom they were responsible for teaching. They disseminated their rubrics, overviewed and demonstrated the skill(s) to be learned, stressed safety of operating the various pieces of equipment needed, and facilitated and assessed the assignment. For livestock-type laboratories, each teacher demonstrated various skills to his or her students, such as snaring swine, fitting cattle, bracing sheep, shearing goats, and saddling horses. In addition, each student participated in six different plant experiments in which they developed and tested hypotheses, collected data, and presented their findings to each other, as per guidelines emulating the Agriscience Fair CDE. Students also completed fictitious purchase orders (POs) and designed the physical surroundings of a greenhouse with specific attention to the sprinkler system and overall flow they hoped to attain. Although they likely need additional time and experience to refine their skills, they are now able to perform the basic functions associated with laboratory environments within the school system. The multiple iterations associated with each student playing the role of teacher allowed for various types of skill development, which are necessary to be an effective laboratory instructor in Oklahoma.

Future Plans

Due to the success of this course, it will be maintained as a key component of instruction during the student teaching semester. However, to accommodate additional skill development over a longer period of time, the course will be expanded to a semester-long seminar course. The change of format will allow faculty to interact with student teachers throughout the semester of their internship for *just-in-time* training regarding pertinent questions that arise.

Cost/Resources Needed

Student participants in the course were required to pay their normal academic tuition and laboratory fee ($44.45) for the course. Guest lecturers consisted of those who had extension appointments or were interested in serving the department for the common good. These individuals donated their time to teach aspects of the class, and many of them provided the supplies necessary to perform the application component for which they were assigned to lead. Specific supplies purchased by the department included cattle show sticks, scotch combs, rice root bristled brushes, livestock shampoo, hog whips, pink oil, tail adhesive, halters, and orange rubber cones. The department also leased two pickup trucks for the trailer backing experience.

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Innovative Idea

Game-Based Learning: Getting Student's to go 'Kahoot' for Assessments

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Game-Based Learning: Getting Student's to go 'Kahoot' for Assessments

Introduction

The Entertainment Software Association (ESA, 2014) posited that game-based learning has become an effective method of education in the classroom. With the increasing popularity of gaming, educators are interested in the effects digital games have on students in the classroom (Entertainment Software Association, 2014). Utilizing game-based tools in the classroom can boost cognitive learning among the average performing students by as much as 12% (D'Angelo et al., 2014). Research suggests that the traditional classroom has begun to see a transformation to a game-based learning pedagogy to better engage and meet the needs of students around the world (Tapscott, 1998).

"Kahoot, a game-based classroom response system, that builds quizzes, is used by teachers, students and businesses to empower educators and captivate learners" (Kahoot, 2014). This response system has the opportunity to engage students and provide friendly competition among peers. At the post-secondary level, Kahoot can be used to allow instructors to gauge student performance while providing immediate feedback to students. The immediate feedback allows students to gauge their own performance and see where they can improve before exams and advanced assignments are administered (Conoley, Croom, Moore, & Flowers, 2007). Immediate feedback allows educators to determine the quality of questions they are asking and gain a better understanding of the progress their students are making (Kahoot, 2014).

How it Works

Kahoot is an audience response system that allows teachers to create quizzes, surveys, or discussion assignments. Students participate via a smartphone, tablet, or computer. Once teachers create an assignment, a pin is created and students input the pin to participate. Students receive points for a correct answer and the speed in which they selected that option. Instructors can utilize Kahoot to conduct formative assessments, review for examinations, or conduct pre-tests to gauge student's prior knowledge about a particular topic. Post-tests could also be conducted and compared to pre-test results to measure growth among the students knowledge base.

Table 1

Steps to Setting Up a Kahoot Account and Creating Your First Assignment

Step	Activity	Description
Step 1	Create your own Kahoot account	Navigate to www.getkahoot.com and click, "get my free account." Proceed to provide Kahoot with your role as a teacher or student, valid e-mail address and username.
Step 2	Create new Kahoot	Click on quiz under the "Create Kahoot" column and begin creating the quiz for your classroom.

Step 3	Fill out quiz	Type your question for the class in the “Question 1” textbox, followed by typing four answers in the “Answer” textboxes.
Step 4	Select correct answer and upload optional image or file	Select the correct answer to the question by clicking, “correct” under the answer textbox. You also have the option to upload an image or file to the question.
Step 5	Complete Quiz	Continue steps 3 and 4 until you have the desired amount of questions to complete your quiz. When complete, click “Save & Continue.”
Step 6	Settings	Select the language, settings, audience and cover photo for your quiz and then complete the quiz by clicking, “done.”
Step 7	Students take quiz	Have students take the quiz by providing them with a pin. After each question, students receive immediate feedback.

Results to Date

The utilization of Kahoot in the classroom has yielded positive comments from many students including pre-service teachers enrolled in AgEdS 488 at Iowa State University. One student noted that the response system was easy to understand while being feasible and effective at the same time. Pre-service teachers integrated the response system when they were completing student teaching because it was an innovative assessment strategy that garnered student excitement about learning. Secondary students expressed positive comments regarding Kahoot, the immediate feedback, and friendly competition.

Future Plans/Advice to Others

Continuous evaluation of the effectiveness of this tool in the secondary and post-secondary classroom should occur. When preparing to use Kahoot, make sure that all students have the needed resources (e.g., phone/ tablet/ computer) in order to avoid students feeling ostracized. Creating and sharing resources (i.e., quizzes) within Kahoot between pre-service and in-service teachers could allow for a substantial resource bank to be established. Examining the other features available in Kahoot (i.e., discussion and survey features) could also serve as a useful tool in the secondary and postsecondary classrooms.

Costs/Resources Needed

All of the quizzes included with Kahoot are offered for free to any individual. Learners in the classroom using Kahoot must be able to access a smartphone or tablet that has a web browser (Kahoot, 2014). If Wi-Fi is not available, Kahoot can operate from data plans on smartphones/ tablets. Data charges vary between providers and should be examined before prolonged use. If a computer is being used in a classroom setting, a projector would also be useful to share the results with the classroom as a whole.

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Innovative Idea

Graduate Extension Scholars Pilot Program: Preparing the Next Generation of Agricultural Scientists to Engage in Quality Outreach

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Graduate Extension Scholars Pilot Program: Preparing the Next Generation of Agricultural Scientists to Engage in Quality Outreach

Introduction/ need for innovation

Expectations for high quality outreach components of competitive federal research grants are on the rise. Unfortunately, this is typically not part of graduate training (even at land-grant institutions), leaving research faculty members underprepared for this component of their projects (O'Meara & Jaeger, 2006). Furthermore, graduate students in life sciences disciplines in a college of agriculture were less likely to engage in extension and outreach activities when compared with their social science peers (Bagdonis & Dodd, 2010), leaving them at a disadvantage. These graduate students have a sophisticated understanding of cutting-edge research in their disciplines, but lack training on communicating it to educators and youth.

4-H youth development agents and secondary agriculture teachers are highly skilled at developing engaging educational activities for youth, but lack access to emerging research in agriculture. Additionally, these two groups of educators have limited opportunities for collaboration and it has been shown that collaborations that do exist can focus primarily on livestock shows and fairs (Murphrey, Harlin & Rayfield, 2011). Collaboration on curricular efforts has the potential to be mutually beneficial by providing resources that can be used by educators in either setting, thus maximizing the impact of outreach efforts.

The new Graduate Extension Scholars program in the College of Agriculture and Life Sciences (CALS) at Virginia Tech represents an innovative, collaborative approach to graduate education that addresses these issues and integrates and enhances current efforts by the Virginia FFA and 4-H organizations. The CALS Strategic plan highlights the importance of working with local schools to enhance STEM education in the context of agriculture and this program meets this need. This project is also in direct alignment with the 4-H Science mission mandate and is complementary to the work that is already being done in this area.

Program phases

The goals for this program are to 1) increase graduate student capacity for engaging with stakeholders to develop high-quality educational programs for youth, 2) encourage partnerships between CALS researchers, secondary schools, and communities in Virginia, and 3) expand youth awareness of and interest in STEM research opportunities in agriculture. These goals are addressed through the following program phases:

1. Formation of a planning team and securing funding for the pilot of the Graduate Extension Scholars program (Spring 2014).
2. Recruiting of graduate students in CALS to participate in the pilot program (Spring 2014).
3. Collaborative development of graduate seminar by planning team (Fall 2014).
4. Formation of curriculum development teams consisting of a graduate student, a 4-H agent and a secondary agriculture teacher (Fall 2014 – Winter 2015).

5. Educational program development (Winter-Summer 2015). Curriculum teams work collaboratively to develop, pilot, and revise classroom-based and out-of-school-time educational programs for youth in their county that are based on the graduate student's research. Project leadership works with the teams to ensure that programs are consistent with the overall goals of 4-H programming and secondary agriculture curriculum frameworks in [State].
6. Dissemination of curricula (Summer 2015; Winter 2016). Graduate students, along with their team members, share their educational programs at the Virginia Association of Agricultural Educators annual conference and the Virginia Cooperative Extension winter professional development conference. Curriculum teams prepare their projects for publication on the new Graduate Extension Scholars website.
7. Evaluation of the program (Summer 2015).

Results to date/ implications

Phases 1-4 have been completed to date and curriculum development is currently underway. The innovative approach of this project is highlighted in the composition of the planning team that was established. Project leadership with expertise in STEM education in agriculture and 4-H youth development presents an exciting opportunity to forge partnerships between these two groups in Virginia. The inclusion of extension and research faculty in the life sciences on the planning team ensures that activities are consistent with expectations for graduate training. Finally, the team includes an agricultural education faculty member with program planning expertise to guide development in the pilot year.

Four graduate students were recruited for the pilot cohort and each student was paired with a high school agriculture teacher and a 4-H youth development agent in the same or a neighboring county. These teams were developed through utilization of personal connections of planning team members and identification of counties with an expressed interest in the topic of the graduate student research projects (horticulture industry best management practices, biofuels, silvopasture, and plant pathogens). Each team held an initial planning meeting led by the program director and the graduate students have made initial site visits to observe the educational environments, meet the youth they will be working with, and begin planning their educational module with their partners. Modules have been outlined and will be based on problem-based learning, design challenge, and inquiry-based learning models.

Future plans

Educational program development and piloting will continue through Spring 2015 and resulting products will be disseminated to constituent groups beginning Summer 2015. The pilot program will be evaluated in Summer 2015 and results will be used to inform future iterations of the program. Plans are also underway to recruit a new cohort of graduate students for 2015-16 and the program leader is working to garner institutional support for the long-term continuation of the program.

Costs/ resources needed

This work was funded by an internal Community Viability mini-grant for $22,000 awarded by the College of Agriculture and Life Sciences at Virginia Tech. The majority of grant dollars provide support to graduate student participants to allow them release time from their research to devote to this project. Additional funds were used to provide honoraria for participating teachers and agents, supplies for the development and delivery of educational modules, travel for graduate students to make site visits, and summer salary for an agricultural education graduate student to conduct a program evaluation.

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Improving Preservice Teachers' Technical Content Knowledge through Virtual Labs

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Improving Preservice Teachers' Technical Content Knowledge through Virtual Labs

Need for Innovation

Online education has expanded beyond simple lecture courses to encompass laboratory courses as well (Grizzle, Saxton, Snow, & Edmonds, 2008; Reuter, 2009; Smesny & Bellah, 2012). These virtual labs allow traditional or non-traditional students access to the experiential learning experience via partially or completely online learning modules, to be completed at the time and pace of the individual student (Peterson & Keeley; Sommer & Sommer, 2003). Numerous studies have demonstrated that students enrolled in online laboratories perform just as well as students in physical classes (Peterson & Keeley, 2012; Reuter, 2009; Smesny & Bellah, 2012; Sommer & Sommer, 2003).

It is widely understood that agriculture teacher preparation programs are responsible for educating future secondary agriculture teachers in educational techniques, as well as in the agricultural disciplines that they will later teach (Barrick & Garton, 2010). However, as the general population becomes further removed from agricultural production, the ability of a teacher education program to supply preservice teachers with "a breadth of knowledge and skills [and]…enough depth in the subjects they teach to be considered experts in the field" (Barrick & Garton, 2010, p. 37) within a limited number of credit hours is becoming more difficult. Modular virtual laboratory experiences in technical agriculture content areas may increase students' knowledge without increasing their course load.

How It Works

The author will describe the online plant science laboratory model used at [University]. While the laboratory modules recently completed their pilot phase with a group of students outside of agricultural education, future plans include their use with preservice teachers. The virtual modules are hosted on the Blackboard online course delivery website and consist of weekly labs containing introductory videos and assignments. Each lab utilizes previously developed online simulations available for free use by the general public. These simulations allow students to conduct experiments without limitations on time and materials. A free mobile application is also utilized to assist students in learning plant identification, and an alternative assignment was provided for students who did not possess compatible mobile devices. Two hands-on activities were also included, allowing students gain tangible experience in plant science by dissecting a live flower and planting seeds and documenting their growth. Discussion post assignments are utilized to encourage students to interact with fellow virtual learners. A teaching assistant monitored the students' performance each week and maintained regular communication with the students.

Results to Date

A total of nineteen students enrolled in the pilot lab. Informal feedback from the students has been positive; labs and their instructions have been clear, and most students have reported an increased interest in specific plant science topics, including evolution of plant species, plant anatomy, and the life cycles of plants. The pilot was particularly useful in identifying labs whose instructions were unclear or whose feasibility for use in an educational setting was limited. For example, the teaching assistant had difficulty identifying students' work in the app-based assignment due to the app's lack of usernames on posts. Students also expressed difficulty in locating seeds for their hands-on lab because of the time of year.

Advice to Others

The pilot virtual lab course has resulted in the authors' positions regarding advice to others developing virtual labs, as well as advice to those interested in using virtual labs to increase preservice teachers' technical content knowledge. With regard to those interested in developing virtual labs, developing assessment rubrics for assignments before the lab modules are launched has been invaluable in grading assignments, as students have proven to be creatively diverse in their completed work. Availability of live plants, flowers, and seeds may be a limitation depending on the time of year the lab is offered, in which case students should be made aware of possible complications. Keeping in frequent communication with students allows the instructor to be aware of problems with the technology utilized and distribute "Frequently Asked Questions" emails to alleviate confusion. However, creating clear and concise assignment directions at the onset is highly recommended. Finally, conducting a pilot lab is recommended, as the pilot for this project proved invaluable in editing labs for preservice teachers' future use.

With regard to those interested in using virtual labs to increase preservice teachers' technical content knowledge, the pilot lab modules proved that numerous plant science lab simulations were readily available and accessible for students at no cost. Therefore, it is a realistic endeavor for a teaching assistant or teacher educator to conduct an online search and collect these available lab simulations for students' use. While this pilot allowed students to complete the labs for course credit, a list of labs could easily be offered to preservice teachers to enable them to gain "hands-on" virtual experiences in plant science for no additional time or monetary cost on the part of a teacher educator. Similar to a massive open online course, the list of labs could be offered to preservice teachers, who could in turn focus strictly on the labs dealing with topics in which they feel they are less knowledgeable. The authors plan to use the virtual plant science lab list as a MOOC with preservice teachers in Spring 2015.

Resources Needed

Because this lab utilizes simulations and activities that are already available for free use, the instructor should not have to develop new simulations. However, a teacher educator or other individual knowledgeable in the content area must have the time and technical knowledge to conduct an internet search, engage in the virtual labs, and collect those beneficial to preservice teachers. Preservice teachers also need access to the internet and to items needed in the labs; a list of requirements for each lab may be helpful in assisting preservice teachers with lab selection.

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Incorporating Experiential Learning Principles into a Methods of Teaching Agricultural Mechanics Course to Develop Pre-service Agriculture Teachers' Classroom Management Competencies

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Incorporating Experiential Learning Principles into a Methods of Teaching Agricultural Mechanics Course to Develop Pre-service Agriculture Teachers' Classroom Management Competencies

Introduction

Agricultural mechanics instruction is a foundational tenet of school-based agricultural education programs (Anderson, Velez, & Anderson, 2011; Burris, Robinson, & Terry, 2005; Pate, Warnick, & Meyers, 2012). As agricultural mechanics technology is consistently updating and changing, experience in this content area is a must (Wells, Perry, Anderson, Shultz, & Paulsen, 2013). In order to more fully and successfully engage students, pragmatic teaching and learning experiences are required. Thus, agriculture teachers should be prepared to successfully engage students in the content area and actively manage both the classroom and laboratory environments (Phipps, Osborne, Dyer, & Ball, 2008).

In order to develop a firmer grasp of appropriate content and pedagogical techniques, hands-on experiential learning is recommended. As experiential learning is a foundational tenet of agricultural education (Roberts, 2006), such principles can also be appropriately used in an agriculture teacher education course to more fully develop classroom management competencies. As early-career teachers often struggle with classroom management (Phipps et al., 2008), perhaps providing additional experience in this area would be useful for pre-service agriculture teachers.

Agricultural education students at Iowa State University are required to successfully complete the Methods of Teaching Agricultural Mechanics course during their pre-service training. This course is designed to provide pre-service teachers with basic agricultural mechanics content knowledge coupled with sound pedagogical strategies. The technical content within this course includes instruction in mechanics laboratory safety, woodworking, welding, electricity, and small engine maintenance and repair. The pedagogical content covered within this course includes laboratory safety rule development, grading rubric development, mechanics laboratory planning, lesson planning, and content delivery strategies. Thus, pre-service teachers are provided a basic background in agricultural mechanics content while learning methods behind developing and implementing agricultural mechanics laboratory procedures and curricula.

How it Works

Students enrolled in the course were required to teach two lessons during the semester that directly pertain to the aforementioned agricultural mechanics content. The first lesson, grounded in basic woodworking, was taught by students in pairs. Each lesson was designed to cover at least 25 minutes of class time with 10 minutes for lesson questioning and critique by peers and the course instructor. The second lesson, small engines mechanics, was taught by students on an individual basis and was designed to span at least 50 minutes of class time with additional time for questioning and critiquing. During each lesson, course students were asked to simulate an actual secondary agriculture classroom, thereby helping to further simulate the actual teaching experience. As a result of this occurrence, the students often began to respond naturally to the lesson content in ways that would be expected of secondary students (i.e., boredom, disruption, excitement, interest, engagement, etc.).

Based upon students' responses to the lesson, the instructing student(s) were required to react in ways appropriate to a secondary classroom setting. In many instances, student disruptions were relatively minor and quickly corrected with a verbal warning. However, some behavioral issues escalated quickly. In one instance, a student left the work area during a small engines lesson and began to turn on all of the welding machines and ventilators in the facility, creating an excessive amount of noise and significantly diverting the flow of the lesson. Perhaps increased supervision could have prevented such an occurrence. It should be noted that in order to help maintain the fidelity of the classroom environment, the course instructor simply observed and allowed activities to occur organically. The final result of the student disruptions and responses to each instructor and his/her lesson was a deeper understanding of the experience of actively practicing and maintaining effective classroom management, a skill often lacking in early-career agriculture teachers (Phipps et al., 2008).

Implications

The broadest implication of these additional experiential learning exercises in classroom management was students' conceptualizations of the essentialness of effective engagement and classroom management. During a discussion session at the final course meeting, most students reported this to be the single greatest challenge to their teaching lessons during the semester. Most students reported that their experiences will be useful as they prepare to enter into student teaching and, subsequently, their own classrooms. However, some students expressed hesitation at the use of the student disruptions, citing that practicing teaching an often unfamiliar content area (agricultural mechanics) was stressful enough without the added burden of student-related issues. However, as Phipps et al. (2008) indicated, the first year of an agriculture teacher's career is often the most stressful, as learning new content, maintaining effective classroom management, and keeping students engaged is a primary (and in some cases career-changing) challenge that must be overcome if an agriculture teacher is expected to survive in the profession.

Future Plans & Advice to Others

It is expected that the course instructor will continue to implement this experiential learning approach during future offerings of the course. As the course is offered during both the fall and spring semesters, many pre-service teachers have the opportunity to enroll in the course and more fully comprehend a realistic classroom management experience. The authors of this poster recommend that other teacher education courses at Iowa State University adopt this approach. Other institutions should examine the possibility of adding this experiential classroom management exercise into agricultural teacher education program curricula.

Costs

Other than the expected cost of compensating the course instructor, no additional costs were incurred as a result of implementing these classroom management learning exercises.

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Innovative Poster

Innovative Idea

Incorporating the Flipped Classroom Approach into an Agricultural Communications Classroom

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Incorporating the Flipped Classroom Approach into an Agricultural Communications Classroom

Introduction/Need for Innovation

The complexities of the 21st Century require instructors to be innovative thinkers when developing and delivering courses in postsecondary education (Conner et al., 2014). The National Research Council (2009) recommended transitioning from passive to active learning environments to meet the needs of learners. Active learning requires students to do meaningful activities and think about what they are doing, which can lead to improvement in students' thinking and writing skills (Prince, 2004). A flipped classroom stimulates active learning (Conner *et al.*, 2014). In the flipped classroom, students are assigned to view course content in the form of video lectures, PowerPoint presentations, Web-based tutorials, and such outside of class time instead of receiving the traditional in-class lecture. Therefore, time in class is available for discussion and application of the content (Mason, Shuman, & Cook, 2013). Basically, this approach switches classwork and homework. "The intent is to create a more collaborative learning environment where students are focused on working through problems with both the guidance of their teachers and the support of their peers" (Findlay-Thompson & Mombourquette, 2014, p.64). The flipped classroom has yielded both positive and negative outcomes. It has prompted varying levels of student satisfaction (Mason, Shuman, & Cook, 2013; Missildine, Fountain, Summers, Gosselin, 2013) and may or may not improve grades (Ferrari & O'Connor, 2013; Findlay-Thompson & Mombourquette, 2014).

Agricultural communications graduates need to be skilled writers and equipped with related competencies such as grammar, spelling, and punctuation (Clem, 2013; Morgan, 2010). However, these subjects have acquired reputations for being arbitrary and boring (Larsen-Freeman, 1997). The question arises, "How can educators adapt instruction to engage students in these 'boring' subjects while preparing them with skills employers expect?" This poster narrative describes the use of a flipped classroom structure to answer this question.

How It Works

In an effort to maximize in-class time dedicated to reviewing topics related to writing mechanics and editing, the instructor adopted a flipped classroom approach. This particular agricultural communications course is junior-level and designated as writing-intensive. The instructor completed the steps below to structure the flipped portion of the class:

1. Video lectures are recorded for the following topics: Grammar & Spelling, Punctuation, Concise Writing, and Associated Press Style. Lectures ranged from 30-45 minutes and a PDF of the PowerPoint slides was provided for taking notes. Relevant chapters in the required textbook were identified to encourage students to explore additional examples.

2. Students were instructed to watch the videos prior to a specific date. To encourage this, they were assigned a 10-item online assessment related to the corresponding topic area.
3. During class, students worked in groups of four to complete 50-item worksheets. They could use notes, books, online resources, and group discussion to answer the questions.
4. This process was completed during four class periods to address the four lecture topics.
5. Students with the highest worksheet scores were rewarded with extra credit points.
6. At the end of the process, a day was dedicated to addressing commonly missed questions, and students completed a comprehensive editing exercise to review all of the concepts.

Results to Date

To attempt to improve this classroom structure for future offerings, students from the spring 2015 semester (N = 31) provided some feedback on an anonymous form. Overall, students' perceptions of the flipped portion of the agricultural communications course were positive. The majority (n = 17, 54.9%) agreed that this approach to learning these topics was more effective than traditional lecture while 10 (32.3%) students neither agreed nor disagreed. Multiple students said they appreciated having the ability to learn the concepts at their own pace and at a time convenient for them. One student said, "I liked that I could pause the videos and dig deeper into concepts that I did not understand." Students also said they felt more prepared for class. One student said, "It gives students time to absorb information and be more prepared in class with questions, ideas, and knowledge of material." The opportunity for group work was another advantage students reported. They said they enjoyed doing the in-class group activities and working together improved their learning. A student said, "I liked working on assignments in groups because it helped me grasp some concepts better."

Although most students seemed to appreciate this classroom structure, a few students did mention difficulties. One student said, "The flipped classroom approach may make it more difficult/less convenient for students to ask questions." Another student said, "Sometimes remembering to watch the videos was hard. I felt like it was a little longer homework time than most classes."

Future Plans/Advice to Others

Based on student feedback, it appears the flipped classroom structure is an effective and well-received approach to reviewing essential writing topics. This course will continue using this course content design in the future with some changes to address students' concerns. Specifically, a discussion feature will be added in Blackboard so students can ask for clarification during the online lectures. Students also need reminders to watch the online videos and complete the online assessment before each class period. For others considering this course structure, it is important to allow adequate time for planning and development. This semester was the third semester this approach was used, and it still has room for improvement.

Costs/Resources Needed

The instructor recorded the class lectures in an on-campus studio using Mediasite®. The videos, accompanying PowerPoint notes, and online assessments were hosted in BlackBoard, the learning management system. The instructor used multiple grammar and writing textbooks to prepare the videos, assessments, and in-class activities. Producing the content prior to the first implementation did require additional planning and preparation time for the instructor; however, the content is now developed and only needs to be occasionally updated. Students need a computer with Internet access in order to watch the videos and take the assessments.

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Integrating Fundamentals of Agriscience Through 4-H Record Books

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Integrating Fundamentals of Agriscience with 4-H Record Books

Need for Innovation

The ever increasing need for STEM integration has been well documented in recent literature (James & Marrett, 2011; Moore & Smith, 2014; Singer, 2011). Lack of multidisciplinary experiences render students unprepared to enter today’s competitive workforce (Casner-Lotto & Barrington, 2006; National Research Council, 2009a). Agriculture provides innumerous multidisciplinary connections, making youth programs such as 4-H and FFA ideal platforms for agriscience and STEM integration (Melodia & Small, 2002; Wooten, Rayfield, & Moore, 2013). Although agriscience research opportunities in Virginia have increased in recent years, participation rates have been slow to climb. This could be caused by a number of factors including time constraints, insufficient dissemination of information, or general lack of interest. In an effort to further emphasize agriscience content knowledge and provide opportunities for further inquiry while minimizing the additional workload required of 4-H Volunteers and Extension Agents, an effort to modify pre-existing record books utilized by the Virginia 4-H Horse program has been initiated.

How It Works

Currently, the Virginia 4-H Horse program requires youth to complete an annual record book on all current project animals as a qualification for the State 4-H Championship Horse & Pony Show. Given recent participation rates of more than 500 youth annually, modifications to the required recording process would efficiently work towards heightening agriscience awareness in this community without unnecessarily increasing volunteer workload. Although the current curricula being utilized for record books effectively details basic aspects of equine ownership, it is relatively simplistic and does not require students to think critically about equine care and management. While proper record keeping is undoubtedly an important skill, the proposed curricular changes will also encourage students to reflect on how to approach common problems, as well as how current practices might be improved.

This project aims to rectify this pitfall in three key ways. Given that record book curriculum for the Virginia 4-H Horse Program is already undergoing a revision process, project associates are working to coordinate with staff and volunteers to increase agriscience and STEM connections throughout the curricula. This will benefit youth participants by bringing more attention to the numerous real-world implications present in equine care and management. Secondly, this project is working to develop an optional addendum to current Virginia 4-H Horse Program record books that will allow students interested in agriscience to further develop their knowledge of how STEM disciplines impact and interact with the equine sciences. More specifically, this addendum will require students to reflect on the disciplinary origins of common equine practices, as well as how further incorporation of multidisciplinary knowledge might be used to improve current practices. Lastly, the pre-existing workload of program volunteers and county level extension agents must be taken into consideration, as they are most likely to provide support to the program participants completing updated record book curricula. Consequently, project associates are working to implement educational opportunities for these individuals in order to help ensure that local leadership within the Virginia 4-H

Horse Program is comfortable with assisting youth throughout the updated record book process.

Implications

Although implementing the curricular changes outlined above will only reach a limited population of Virginia 4-H participants and volunteers initially, it provides an ideal starting point that project associates can continue building upon in the future. The efforts of this project to heighten youth awareness of the innumerous connections between agricultural and STEM disciplines is vital in assisting youth to become more prepared for the competitive and multidisciplinary job market they will be entering. These types of curricular changes work towards answering the National Research Council's (2009b) call for increased critical thinking abilities and transferable skills.

Future Plans

At this time, preliminary project planning has been completed, and areas for improvement have been identified in current Virginia 4-H Horse Program record books. Project associates will continue working with Virginia 4-H Horse Program staff and volunteers to revise record book curricula through the spring, and plan to enter the publication process during the summer of 2015 so as to implement the updated curricula for the 2015-2016 4-H year. Record book addendums will also be revised, published, and implemented during this timeframe. Virginia 4-H Horse Program participants will have the opportunity to submit their updated record books for judging at the 2016 Virginia 4-H Championship Horse & Pony Show. After revisions to Virginia 4-H Horse Program's record books are successfully implemented, it is our intention to work towards implementing similar changes in the Virginia 4-H Livestock Program and other factions of 4-H throughout the state.

Costs/ Resources

Additional costs of this project are minimal because we are working within the existing structure of the current record books. Personnel time to identify and develop revisions is the only resource required.

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Poster Type (Idea)

Legacy Leadership: A New Leadership Development Program for Florida Department of Agriculture Employees

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Legacy Leadership: A New Leadership Development Program for Florida Department of Agriculture Employees

Introduction / Need for the Innovation

The Florida Department of Agriculture and Consumer Services (FDACS) sought a partner for developing and providing a new leadership development program to support and encourage the continued leadership and professional advancement of its most effective and promising leaders. Selected FDACS employees have completed the Certified Public Manager program, but the agency expressed a need for a new, more advanced leadership development program for its highly valued agency administrators. The goals of the program were to develop managers in the agency who possess leadership qualities that will create lasting impacts in the agency and to elevate the leadership skills among agency managers. Rather than a leadership program that inspired agency employees to become leaders, the agency sought a program especially designed for those who were already recognized by their peers as leaders and whose motivation and skills would support their continued advancement and that of FDACS.

How it Works / Methodology

The Institute of Food and Agricultural Sciences (IFAS) at the University of Florida was approached by FDACS about providing a new leadership development program for its division directors, assistant division directors, and bureau chiefs. This would be the first-ever leadership development program for these leaders provided by this state agency. IFAS had been delivering a similar leadership development program for its newly appointed and aspiring unit leaders and administrators for more than 10 years, and an agreement was reached to deliver the program. FDACS designated two individuals in its human resources division to join with the three-member team in IFAS in designing and delivering the program. FDACS took full responsibility for the participant selection process and used an internal nomination and committee selection procedure. In the words of the commissioner of agriculture, “only those that demonstrate true legacy leadership” were selected to participate in the program. The commissioner presented the program as a high level, prestigious leadership development opportunity for carefully selected administrators in the agency and coined the program name “Legacy Leadership.”

The curriculum was based on an FDACS internal needs assessment. Executive managers, division directors, assistant division directors, and bureau chiefs rated the need for bureau chiefs to receive additional training in more than 100 job performance areas identified by the agency’s personnel division. The bureau chiefs provided a self-rating, and the other groups rated the bureau chiefs in these performance areas. The skills which were rated as needed by the bureau chiefs by at least half of the participants in each of the four groups became the curriculum focus of the Legacy Leadership program. IFAS and FDACS leaders then worked together to design the format and duration of the program. The 21 participants of the program completed four, two-day sessions during the 2014 calendar year. These sessions were held in February, May, August, and November on the university campus, at a research and education center, or in the State Capitol Building. The state agency personnel office provided instruction on human resources topics for three to four hours in each session. The remaining instruction on leadership topics was provided by 11 different IFAS faculty members. The leadership sessions focused on leadership fundamentals, employee development, and organizational leadership. The commissioner of agriculture met with the Legacy Leadership participants at their first session and provided a highly inspirational message about their value to the organization and its strong desire to make a significant investment in their continued professional development through the Legacy Leadership program. A graduation event was held in the Cabinet Room of the State Capitol Building at the conclusion of the last session. This event was presided over by the agriculture commissioner, and each participant received a specially designed, framed certificate and leadership pyramid.

Results to Date / Implications

The four Legacy Leadership sessions were delivered in 2014 as planned. Feedback from agency leaders and participants was extremely positive. Over 90% of the participants rated each session as “Excellent.” Comments included the following: “honored to be here, a transformational program for this agency, wonderful, extremely relevant topics, excellent presenters, valuable information, great organization, awesome speakers, excellent meeting facilities, top quality training.” Many similar comments were provided by the participants. The presenters agreed that this was one of the most engaged and appreciative groups with whom they had worked. Participants often brought their own leadership challenges into the discussion, and the highly interactive sessions helped them formulate leadership strategies in their division or bureau. During the course of the program, numerous participants were promoted within the agency. In addition, the agriculture commissioner assembled the Legacy Leadership members on several occasions during the year to assist him in identifying potential responses to a situation or opportunity in the agency. Evidence suggests that the Legacy Leadership program has invigorated the leadership environment in FDACS and successfully launched some of it most effective leaders on a continuing leadership development journey.

Future Plans / Advice to Others

FDACS asked IFAS to deliver the program to a second cohort in 2015, and 23 FDACS employees have been selected participate. Their first session was held in March 2015. Only slight adjustments are planned in the 2015 curriculum, given the highly favorable feedback received on the 2014 program. In 2015 a clear point person in FDACS and IFAS will serve as the program leads and partners in managing all aspects of the program. In addition, FDACS will receive an estimated budget for the duration of the program and purchase most program materials in advance.

Costs / Resources Needed

All participant expenses were paid by FDACS, including travel, meals, lodging, books, and assessments. FDACS also paid for the instructors’ overnight lodging when sessions were held away from the university campus. The agency intended for the program to be a “first class” leadership development experience for its selected leaders, so the program developers were able to purchase a wide range of books and assessments for program participants. All program presenters contributed their time to the program. The total cost of the program was approximately $18,500, all of which was paid by FDACS.

Meeting the Challenges of Managing Volunteers in the Digital Age: Facilitating the Mentorship of African Agribusiness Entrepreneurs

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Meeting the Challenges of Managing Volunteers in the Digital Age: Facilitating the Mentorship of African Agribusiness Entrepreneurs

Introduction

At Oklahoma State University (OSU), a digital portfolio was used to develop, organize, and promote mentorship opportunities as part of the *2014 Empowering Aspiring Entrepreneurs for Economic Success: A Professional Fellows Program for Kenya, South Africa, and Uganda* at OSU. "Creating professional relationships and mentoring experiences among U.S. entrepreneurs and mid-level, up-and-coming agricultural entrepreneurs from Kenya, South Africa, and Uganda" (Edwards, Sitton, and Cartmell, n.d.) was the primary aim of an exchange program for 23 professional Fellows and their volunteer mentors in 2014. The program participants (Fellows) represented agribusiness entrepreneurs, educators, and textile/food professionals. An essential part of the program's success was establishing relevant internships involving intensive mentoring. The mentoring aspect of the program relied on volunteers that highlighted small business planning, food security management, and international agricultural trade.

White, Meyers, Doerfert and Irlbeck (2014) stated, "[the] Internet has had a significant impact in how agriculturists get their information and how they communicate. The use of user-generated media, especially social media, now provides agriculturalists free and practically instantaneous channels through which to engage with their audience members" (p. 72). This finding supports what McKee and McKee (2012) indicated as the "new breed of volunteer . . . [they] communicate faster and more efficiently, mobilizing the masses more than ever before . . . They are tech-savvy, have multiple obligations, desire flexibility, and do not want to be micromanaged" (p. 23, 132).

Attracting and informing potential volunteer mentors was a critical motivator for developing a digital resource for recruitment, training, and future reference purposes in regard to participants of this project. One online tool identified to facilitate engagement between OSU team members, volunteer mentors, and Fellow mentees was the development of a digital portfolio. This device provides an easy, efficient way to post and update critical documents, links, and multi-media content into an accessible online resource that addresses the information needs of these *new volunteers*. It can be used to promote a program, organize critical documentation, share information within a team or workgroup, and serve as a training resource that can be accessed anywhere via the Internet.

How it Works

To facilitate the development of a digital portfolio, a free online application called *LiveBinders* was identified as a system that could be tailored to fit the volunteer recruitment and training efforts needed for the Fellows program as well as future projects. Using online templates, *LiveBinders* users can easily upload documents and photos to develop visually attractive, useful resources. Developers and their intended audience(s) can access the digital resources immediately. Currently using any component of the *LiveBinders* site is free. Many examples are posted for use in producing professional portfolios to serve a number of purposes.

Results/Findings

Developing materials to facilitate communication among the Fellows and their mentors both during the US-based mentorship as well as in the future was a primary responsibility of the program's graduate assistant. The digital portfolio aligned well with the program team's goal to encourage use of social media and Internet communication capabilities to enhance ongoing collaborations long-term. In the future, existing materials will be updated and enhanced. As well, additional resources and pictorial records of the project will be added for use by Fellows, their mentors, and university team members. Fifteen different types of documents were developed, formatted, and included in the Volunteer Mentor Portfolio (VMP):

Fellowship Group Photograph
Mentee-Mentor Contact Information
Mentor Descriptions and Goals
Mentor Evaluation Framework
Mentor-Mentee Collaboration E-mail
Mentor Orientation Training Agenda
Mentorship Experience Goals
Mentor Recruitment Brochure
Mentor Thank You Letter
Program Description
Program Mission and Objectives
Program Policies and Procedures
Volunteer Certificate Sample
Volunteer Mentor Application
Volunteer Mentor Letter

Future Plans/Advice to Others

The *LiveBinders* online system has unlimited possibilities for use in community, public, private, and school environments.

- Consider the goals of a program and its participants – items such as brochures, pictorial displays, background information, and applications to name just a few of the many promotional materials that can be used to market a program to potential volunteer mentors;
- Acknowledging the contributions of grantors, sponsors, and participants goes a long way to building social capital and enduring involvement in the program;
- Using colorful templates, readable font styles, and including important symbols such as flags, historical information, and maps in digital portfolios give volunteer mentors and mentees the background and knowledge to succeed in building relationships from the beginning of their experience that stand to last long-term.

Resources/Costs

Program knowledge, volunteer qualities, time, and openness to experiment with digital capabilities are primary resources needed to build a *LiveBinders* online portfolio. It is beneficial for global communication, teaching and promotion of relevant programs and their volunteer management activities. In the case of this project, a portion of a half-time graduate research assistantship was used to develop the VMP. This online resource supports the US Congressional mandate of "increasing mutual understanding between people of the United States and other countries . . . and thus assisting in the development of friendly, sympathetic, and peaceful relations" (Harrison, Cecchini, Aabye, & Ettinger, 2014, p. 5).

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“Movie Night”: Using Collaborative Reflection for Microteachings

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“Movie Night”: Using Collaborative Reflection for Microteachings

Introduction

Reflection is an integral component of any teacher’s qualities because it allows teachers to grow from their previous experiences. The context of such reflection can be in-service or pre-service teaching. In-service, for example, may make current teachers adjust their teaching style if their students are not retaining the necessary information to successfully complete the course. However, pre-service reflection for students in agricultural education can be more difficult. As teacher education continues to incorporate teaching laboratories for pre-service teachers to gain experience, the need for reflection also continues to grow. Epler, Drape, Broyles, & Rudd (2013) recommended that pre-service teachers reflect to better help them learn from those laboratory experiences. However, if the student continuously critiques his/her own teaching practices, the reflection may become misleading, uninformative, or even a hindrance to professional growth. Instructors of pre-service teachers should yearn for their students to cognitively analyze and understand their teachings; therefore, collaboration may be an additional venue for reflection. Collaborative reflection stimulates deeper thinking (Epler, et al., 2013). When students come together and collaborate on each other’s teaching experiences, it brings multiple vantage points to the forefront. Allowing certain aspects of one’s teaching to be discussed with others can be a tremendous advantage because a peer’s comment might bring a new perspective to his/her teaching practice. Overall, collaborative reflection leads to better teaching outcomes (Baird, 1992, p. 33).

How It Works

Undergraduate agricultural education students who are enrolled in AEEE 3201: Methods of Teaching Agricultural Education are required to participate in microteachings. A microteaching consist of preparing a lesson plan and teaching a certain portion of that lesson plan using a specific teaching method (typically one recently learned in lecture). The instructor of the course provided each student with a recorded video of his/her microteaching and made that video available online for self-reflection. The students were asked to review his/her microteaching and select aspects of the microteaching he/she did well as well as areas for improvement. Students would take note of these strong and weak characteristics and take this information with them for their post-conference with the instructor.

As a group, students enrolled in this course decided to dedicate one night per microteaching to watching a critiquing each other’s microteaching videos. During “Movie Night”, the students would all sit down around a television and watch each video, one by one. While watching, critiques would be discussed, and the video might be paused to critique a specific action. At the conclusion of each video, the individual whose microteaching was evaluated would have the chance to hear his/her peers’ feedback— both positive and negative. Everyone, including the person’s whose microteaching just finished playing, would have to give one positive aspect of the teaching as well as one critique. For the remaining microteachings, students would utilize this feedback system to improve their ability to teach an agricultural lesson.

Results to Date

Students who participated in this voluntary feedback workshop demonstrated positive progress toward teaching successful lessons. Both the instructor and peers saw a positive difference in students' attitudes towards microteaching activities, including more well developed lesson plans and teaching performances. All students who were involved say they enjoyed the experience "Movie Night" gave them. Chelsea Sutherland, currently a junior in Agricultural and Extension Education and Evaluation at LSU, said she "liked that feedback could be given in real time and the group paused to have conversations at any specific point during the videos." Although students gave overall comments at the end of each video, quality feedback could be given during the video about a particular action. All students who participated in this innovative idea received an "A" letter grade in AEA 3201 and admitted to feeling more confident about teaching in a classroom situation. The majority of the "Movie Night" group was satisfied on how it operated and the results from evaluating their microteachings as a group.

Future Plans/Advise to Others

Daniel Moreno, a junior enrolled in the program, believes that the "Movie Night" was particularly successful because it focused on an already tight knit group of students. It is crucial that the individuals in the reflection group are willing to accept critical feedback. It is not always what students want to hear about their performance, but it is necessary for their improvement and ability to teach youth. The comments given by peers are typically how they truly feel about a certain aspect of the other students' performances and should not be misinterpreted as being destructive in any way. For this reason, it may be implemented as an optional assignment because not all students are equipped to handle these types of comments. If implementing this with a class who do not already know each other well, additional activities would need to be conducted to help students learn how to give constructive feedback and to help them be more comfortable with their peers.

Cost/Resources Need

"Movie Night" was a very simple activity to implement—it's cheap or typically free for a group of college students! Students simply bring a computer to a member of the group's house/apartment, attach a HDMI cable to the television, and watch the microteachings in no particular order. Each participant of the group was responsible for his/her own copies of evaluations as well as writing utensils for note taking. All items needed for this innovative idea are readily available and easily accessible. Depending on the resources available to students, some programs may consider making movie night a department event that could use university resources to allow students to collaborate informally.

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**New Technology Meets Traditional Home Visits:
Using Instagram to Engage Secondary Agricultural Science Students**

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New Technology Meets Traditional Home Visits:
Using Instagram to Engage Secondary Agricultural Science Students

Introduction / Need for Innovation

"Being an effective agriculture teacher goes beyond classroom teaching" (Robinson & Haynes, 2011, p.47). Agriculture teachers are expected to be educators, FFA advisors, livestock supervisors, career development event coaches, and supervised agricultural experience project supervisors. Finding new ways to encourage and promote student success is crucial to the continued success of a program. One of the goals of the National Research Agenda (Priority Area 2) is to increase the use of new technologies and social networking skills for communication to selected target audiences (Doerfert, 2011, p.17). In order for agriculture education teachers to adapt to an ever-changing educational environment, they must possess the skills necessary to integrate technology into their classrooms (Williams, Warner, Flowers, & Croom, 2014). This innovative project uses current social media trends combined with the traditional concept of a home visit.

How it Works / Methodology

At the beginning of the school year, parents are sent home a letter explaining the purpose of a home visit and they are also informed about it at Back to School night. Students work with the teacher to arrange a time and date for the home visit to occur. The teacher will come to the student's home or desired location. The student, parent(s), and teacher discuss information such as the class he/she is enrolled in, interests, hobbies, sports, siblings, class organization, contact information, possible SAE projects, FFA interests, and more. This initial home visit serves as the foundation for the student's involvement in the classroom, with their SAE project, and with FFA. The practice of making home visits enables teachers to build personal relationships with students (Robinson & Haynes, 2011). During the visit, a unique photo is taken with the teacher and the student; often times the picture is taken with something fun from their house (e.g., pet or specific place). The parent takes the photo and is informed that this is for the teacher's home visit Instagram post highlighting their son/daughter. If they have any issues with their child's photo being posted on social media, the picture is not taken. No parent has expressed disapproval of this process to date.

Immediately following the home visit, the creative Instagram photo is posted and student bio written so that information about the student is recorded promptly, alleviating the need for additional paperwork at school. The post will include creative Emoji's which are "picture letter characters" used to provide creative fun to numerous social media outlets such as Instagram, Facebook, Twitter, Snapchat, Tinder, Google handouts, WhatsApp, and much more (Apple Inc., 2015). These small characters are extremely popular in the age groups spanning junior high to high school. The post will also include hashtags to any significant areas of involvement such as #saeprojects or career development event teams like #noviceparlipro. The student's personal Instagram account is tagged if they have one and if their parents want to see the post a screenshot of the post can be texted or emailed to the student. Each home visit is numbered to keep track of the order and given the hashtag #SLOFFAHomeVisits to promote the home visit with the community and to highlight information about that student in a supportive, inventive way.

According to Instagram statistics, there was an 85% increase in its usage among teens ages 16-19 in 2013 and currently 51% of the class of 2014 uses Instagram daily (Ramblings, 2015). Using the #SLOFFAHomeVisits keeps a record of all the students for future recruitment and retention strategies. This one photo with their teacher posted on social media is powerful. Friends, peers, parents, and community members see this as a commitment from the teacher to the student. Instagram posts also serve as record keeping documentation for each student. It is a modern day student data sheet that draws students to involvement using a student's preferred communication technology. The teenagers in this millennial generation are tech-savvy, community-minded individuals who prefer to communicate via text messaging, blogging, Facebook, and other more social types of media (Bowen, Stephans, Childers, Avery, & Stripling, 2013).

Results to Date / Implications

"Technology has the potential to improve education but only if it is applied with purpose and consideration of the audience" (Murphrey, Rutherford, Doerfert, Edgar, & Edgar, 2012, p. 56). Since August 2014, 70 freshmen home visits been conducted and documented via the Instagram post hashtag method. All of these students have a current Supervised Agriculture Experience project and are active in the FFA chapter's activities. Eighty percent of the students who received a home visit have participated in at least one public speaking contest and 40% joined Career Development Event teams. All have indicated future participation in agriculture courses.

This innovation serves as a direct way to "improve student engagement and learning, and increase our academic discipline's knowledge of approaches that influence the practice of technology diffusion" (Bumguardner, Strong, Murphrey, & Dooley, 2014, p. 32). Since September 2014, the teacher's Instagram account has received over 125 new followers including parents, students, community members, FFA officers, and other agriculture teachers. Home visit posts have become an 'exciting' highlight for each student and many people in the community are thankful to learn about key components to agricultural education via the student's interests. These posts help promote public support of "agriculturally literate people making personally informed decisions about agriculture related topics" (Doerfert, 2011, pg. 12).

Future Plans

The 2015-2016 school year registration process takes place each March. The Instagram posts will be used as a recruitment strategy along with a post card reminder mailed directly home to parents. The post card will have suggestions for courses based on the information gained at the home visit and posted to the instagram account. The posts will also be uploaded to the chapter website as class records for these students as they progress through the FFA program.

Costs / Resources Needed

The use of Instagram is free. A district vehicle with gas card was provided for transportation to homes when necessary. The school district gas card was made available when using a personal vehicle. Photographs of the Instagram posts were used to make a #SLOFFAHomeVisits bulletin board for our department. The cost of printing was under $10.

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Poster Type: Innovative

Nonlinguistic Representation of the Ag Ed Philosophy

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Nonlinguistic Representation of the Ag Ed Philosophy

Introduction/Need for Innovation

Too often students are asked to read and reflect on a text passage without having to take it to the next level. In an effort to engage higher order thinking (Bloom et al., 1956), students need to do more than simply read text. They must be asked to think about the text to create a deeper meaning. The use of creative thinking should be encouraged and fostered. Creative thinking involves "putting together information to come up with a whole new understanding, concept, or idea" (Morre, 2015, p. 380).

No two students are the same in any classroom. The use of differentiated instruction is a practice which is encouraged by all teachers to help meet the needs of all students (Tomlinson, 1999). Differentiated instruction can take place by modifying the instructional delivery or the assignments (Moore, 2015). While this type of instruction has typically been used when teaching students with special needs, all students can benefit from differentiating instruction (including gifted and talented).

One way to accomplish differentiation is through the use of creative assignments. Nonlinguistic representations are helpful in the college classroom because most of the content is delivered orally or in text form (Marzano, Norford, Paynter, Pickering, Gaddy, 2001). Students' use of such representations help stimulate and increase brain activity (Gerlic & Jausovec, 1999). The use of pictures or pictographs for students to convey comprehension is a practice which should be encouraged and supported (Marzano et al., 2001).

Efforts must be made to meet the diverse learning needs of students, while at the same time asking them to think at a higher level. These items can be accomplished through the purposeful design of course assignments. One such assignment is the nonlinguistic representation of a philosophy.

How it Works/Methods/Steps

Students were taught about the history, development, and philosophy of agricultural education. Students were asked to read and critically think about the nine components of the philosophy of agricultural education (Phipps, Osborne, Dyer, & Ball, 2008). They were then asked to create a visual representation of their interpretation of the philosophy.

A brief description of the nine components of the philosophy of agricultural education (Phipps et al., 2008) include: 1.) Places emphasis on the individual learner, 2). Instructional programs and student learning activities must reflect the dynamic and ever-changing industry of agriculture, 3.) Important responsibility in career guidance and counseling, 4.) Believe in the importance of citizenship and leadership development, 5.) Agricultural education should be accessible to students having a wide range of academic and social skills, 6.) Benefits students in a variety of ways, 7.) Community oriented, 8.) Progressive learning experiences, 9.) Believe in the essential components.

Students were instructed to use minimal text when creating their graphic. They could hand-draw or use computer software to create their nonlinguistic representation. In addition to the visual, they were also asked to write a short explanation to more clearly communicate their graphic to the viewer.   Students were assessed on how well the illustration conveyed the philosophy, level of originality, creativity, as well as the clarity statement.

Results to Date/Implications

Students in [class] completed this assignment as a follow-up to a poorly answered test question regarding the philosophy of agricultural education. The goal was to encourage them to think more in-depth about the philosophy. Students created several unique and inventive visualizations of the agricultural education philosophy (Figure 1). Several students drew their interpretation of the philosophy while others used a computer program to assist in the creation of their nonlinguistic representation.

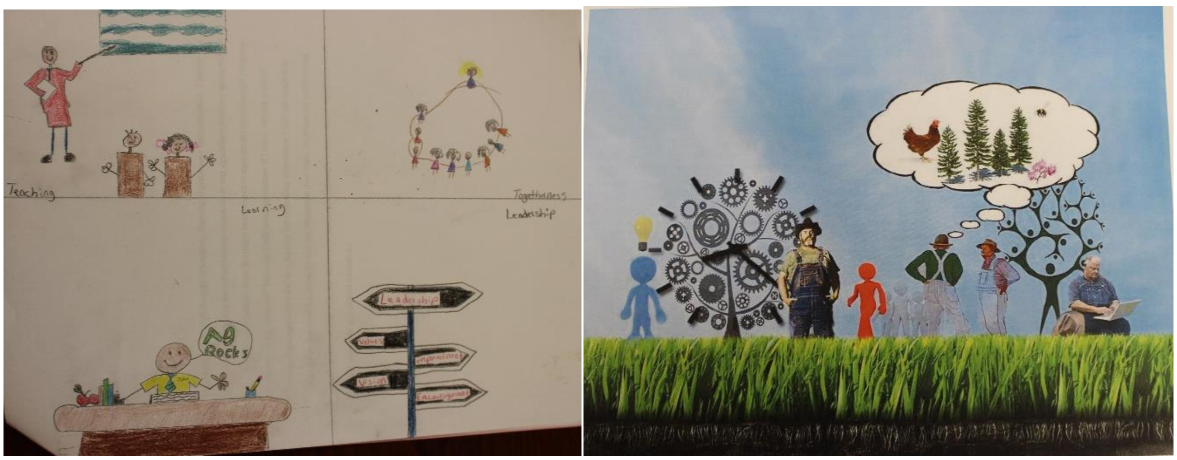

Figure 1. Student examples of their interpretation of the agricultural education philosophy.

Students appeared eager to finish this assignment and their level of artistry was impressive. Some students wanted more direction and an example to look at, but we felt it was important that they only use their own imagination to create their final product.

Future Plans/Advice to Others

This assignment has been added as a regular assignment in the course. Students will be encouraged to create the assignment using as much creativity as possible. They are able to describe their picture/pictograph in the supplemental paragraph. Students may struggle with this assignment because there isn't a correct answer. The process of asking them to critically think about the philosophy is very important to developing higher order thinking skills. Additional text excerpts could be used to create other nonlinguistic representations of their interpretation and application of material.

Costs/Resources Needed

There are no costs associated for this innovative idea, but the students may incur costs depending on the type of product they create. A copy of the philosophy is required. This course requires the purchase of the textbook so they already have incurred that cost.

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Providing an International Learning Experience for Undergraduate Students without Leaving Home

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Providing an International Learning Experience for Undergraduate Students without Leaving Home

Introduction/Need for Innovation or Idea

Agriculture students should possess knowledge and attitudes of international awareness and global competence (Irani, Place, & Friedel, 2006). "Many scholars see globalizing [or internationalizing] the undergraduate experience as an increasingly important university goal" (Bruening & Frick, 2004, p. 90). According to Bartell (2003), many universities across the United States and in Canada emphasize internationalization in their degree programs. "International literacy has become critical to our cultural, technological, economic, and political health. International competence in an open world of permeable borders has become a generalized necessity rather than an option" (Bartell, 2003, p. 49). The current growth, complexity, and competitiveness of the global economy drives higher education institutions to create more dynamic opportunities to face the challenges of the changing environment by equipping their graduates with necessary skills, attitudes, and knowledge (Sporn, 1996).

As part of a project funded by the U.S. Department of State, 11 Kenyan, South African, and Ugandan entrepreneurs participated in a month-long training program at [University] during the fall semester of 2014. Most were agricultural and agribusiness entrepreneurs. During their stay in the United States, the *Entrepreneur Fellows* received instruction on entrepreneurship and small business development. They were also engaged in numerous cross-cultural activities, including historical tours and interactions with U.S. students at the [University] campus.

How the Program Works(ed)

The American Council on Education's (1995) Commission on International Education stated that universities across the United States must offer an authentic educational environment without boundaries if the nation and its people are to thrive in the environment of the 21st century. Bartell (2003) stated "[g]overnment-to-government foreign assistance projects as funneled through domestic universities have had a negligible effect on the internationalized culture and structure of these universities" (p. 49). However, citizen exchange programs funded by U.S. government agencies and conducted by higher education institutions could contribute in the effort to create international awareness and global competence among undergraduate students, including those studying in the agricultural sciences and natural resources.

At [University], a grant-funded project provided opportunities for undergraduate students to improve their international awareness and global knowledge without leaving campus. Project team members who were faculty members and graduate students invited the *Fellows* to participate in their courses, including AGCM 4113, Feature Writing and Editing for Agricultural Publications and AGED 4713, International Programs in Agricultural Education and Extension.

The AGCM 4113 students conducted interviews allowing them to learn about the *Fellows* while practicing their interviewing skills. In AGED 4713, students rotated among the *Fellows* in small discussion groups. (Students had read *The Bottom Billion* [Collier, 2007], which discusses *traps* facing many African countries; it provided a context for posing questions.) After the small group discussions, the students were asked to reflect on what they learned through an online threaded-discussion by responding to an initial prompt: “In one or two paragraphs, writing complete and grammatically correct sentences, explain the most important *take home message* you gathered from your discussion with the African Entrepreneur Fellows whom you met. Discuss why that was (is) important to you.” Students were required to respond to another’s post.

Results to Date/Implications

Selected statements describing students’ reflections on their interactions with the African Entrepreneur Fellows follow:

“Meeting with the Africa[n] Entrepreneur Fellows was a great experience that I thoroughly enjoyed. [It] really helped me to better understand agriculture in Africa.”

“After meeting with the African Fellows, two "take-home" messages that really stood out to me were the importance of perceptions in agriculture and women's empowerment. I loved hearing how each fellow had a plan for their business and how each plan changed agriculture in a good way.”

“I feel that it was interesting meeting with the entrepreneurs last week. I was a great way to better understand agriculture in other developing countries and how they are changing the way they do agriculture.”

“The most important message I gathered from the African Entrepreneur Fellows is that even though they come from very different environments they are still passionate about the same things as me. We all share a passion for developing youth, so that we will continue to progress and solve the world’s problems.”

“I think the main ‘take home message’ that I noticed was that these guests were here to learn more about ways they can promote agriculture and farming to their youth.”

Student testimonies and related themes will be shared during the poster presentation session.

Advice to Others

Educators can explore international perspectives more authentically in their courses by involving international visitors and facilitating online discussions and/or reflective journaling (Hubbs & Brand, 2005) complementing the interactions. Opportunities should be sought to engage international visitors in the learning of undergraduate students studying agriculture, including those preparing to be agriculture teachers, Extension educators, and communicators.

Resources

These innovative learning experiences relied on a funded project, so no direct costs were incurred. The interactions took place during class time and should be accounted for within the framework of the courses involved. The online discussion was supported by a university-provided *Desire-to-Learn (D2L)* platform that supports all courses at [. . .] University.

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Public Service Announcement: Spreading Farm Safety Awareness Through The Use of the Mobile Application, Glide

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Public Service Announcement: Spreading Farm Safety Awareness through the Mobile Application *Glide*

Introduction

Courses in agricultural production are becoming common in colleges of agriculture at the college and university level (Thompson, 2009). Agricultural educators must place emphasis on their students' safety when students participate in these courses (Daniels, 1989). AGEDS 450 is the senior level capstone course in which students enroll during their final year of a production agriculture-focused curriculum at Iowa State University. AGEDS 450 provides an experiential-learning facilitated laboratory that allows students to gain the practical experience of managing and operating a typical Midwestern farm (Trede & Andreasen, 2000). As stated by Crunkilton, Cepica, and Fluker (1997), a capstone course allows students to integrate previously learned subject matter with new information to solve real world or simulated issues. Experiential learning activities are integrated within the five required components of a capstone course which include team work, problem solving, decision-making, critical thinking, and communication (Andreasen, 2004). Students must work together and make decisions to sell commodities, purchase inputs, and maintain resources on the farm (Trede & Andreasen, 2000). Since students are managing a working farm, they are exposed to the hazards farming can pose.

Ranked as one of America's most hazardous occupations, farming has one of the highest accident rates in the United States, stemming from farm machinery and equipment, storage bins, silos, and animals (DeRoo and Rauitainen, 2000). Farm safety educational programs are utilized to educate, convince, and persuade farmers to participate in safe behaviors (Ambe, Bruening & Murphy, 1994). One excellent way to promote farm safety is to conduct public service announcements. As stated by O'Keefe and Reed, (1990), public service announcements (PSAs) are created to influence public beliefs, attitudes, and behaviors concerning situations that are of great importance to a community, while informing citizens of possible solutions to these situations. One potential platform for delivering PSA's is through the use of social media. Social networking has become popular with educators as an instructional tool since society has rapidly embraced social media (Settle, Telg, Irani, Baker, Rhoades, & Rutherford, 2011). Glide, which has over two million active users, is a walkie-talkie styled application that records a video and sends it to a user's contacts while simultaneously alerting the contact that they have received a recording (Olson, 2013). Though it is mainly utilized for social communication, it has been tested by the instructor and graduate assistant for educational purposes in AGEDS 450. Could the integration of the mobile phone application, Glide, be utilized to develop PSAs in an agricultural capstone course to help students recognize and prevent potential safety hazards and also educate their classmates about these situations?

How It Works

Students utilized Glide to develop PSAs that were distributed to their classmates via personal mobile devices and/or classroom iPads to educate each other about possible safety hazards that have arose during experiential learning activities and performing weekly tasks on the farm. The videos were saved within the application which allowed the students and instructor to review the videos in class. For students who did not have access to classmates' cell phone numbers or for the students who did not want to provide personal numbers, Glide provided a PIN number that allowed contact through the application. Glide allows the user to email the videos they have created to their intended recipients, provided the recipient has Glide to view the videos. Table 1 outlines the steps in creating a Glide account and the downloading of the application to send PSAs to students to educate them on potential farm safety hazards.

Table 1

Steps to Utilizing Glide to Develop Public Service Announcements for a Capstone Course

Steps	Activity	Description
Step 1	Download and install the free application	Download Glide from either the Apple Store or Google Play, depending if the user has an iPhone/iPad or Android. Follow instructions that allow the user to utilize Glide.
Step 2	Add classmates and teacher	Students use each other's contact information, or the anonymous PIN and the teacher's contact information.
Step 3	Begin recording videos	Students identify potential hazards on the farm, record five minute videos describing the hazards and how to remedy them, and send the video to their class members and instructors.
Step 4	Review videos	Recipient of videos may review videos multiple times after receiving. This allows the teacher to grade for content and can even make room for discussion via Glide.

Results to Date

A questionnaire was developed and distributed to the students to assess their perceptions about using Glide within an educational setting. The majority of the students responded favorably to the application and found it user friendly and beneficial to use. Some students indicated that they were more inclined to adopt safe farming practices if they were able to view friends and family modeling safe behaviors through the use of Glide. Anecdotally, the students were highly engaged in this activity providing an alternative teaching method to utilize when covering safe operating procedures. Some students mentioned sharing their videos with friends and family that were actively engaged in farming.

Future Plans/Advice to Other

Safety and privacy is very important when users share information through the Internet. Two users can only interact via Glide when both parties have the application installed on their device. The use of Glide encourages enhancement of team work, communication, decision making, problem solving and critical thinking between students during the collaborative team-based assignment naturally found in a capstone course. The instructor of the course plans to continue to implement this project in AGEDS 450. This activity could easily be adopted for use in several agricultural education related courses; including in an agricultural mechanics course when covering tool usage or in a teaching methods course when preparing interest approaches.

Cost/Resources Needed

Users who plan to utilize this application will need either a smartphone or a tablet that has a wireless connection. The application is downloadable from both the Apple Store for iPhones and Google Play for Androids. Other than the personal charges that the user will incur from owning a smartphone, which may include data usage, the application is free to download and use. The application is also usable via other devices such as an iPod touch.

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Stepping Outside of Comfort Zones Through the Use of Service Learning

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Introduction

Priority four of the National Research Agenda states that learners should be engaged in active learning environments, one that will prepare them for careers in the 21st century workforce. Service learning does just that by engaging students in an experiential setting while promoting student learning, student development, and community engagement (Bringle & Hatcher, 2000; Markus, Howard, & King, 1993, Sax & Astin, 1997). Within the "Teaching Diverse Learners" course, students are exposed to the history and education of diverse populations while emphasizing the planning and facilitating of teaching strategies to assist those with special needs become successful in the agricultural classroom. A service learning project was created to allow students to work with a local program designed for teens and adults (friends) with development disabilities. Andreasen, Seevers, Dormody, and VanLeeuwen (2007) and Elbert and Baggett (2003) both reported that agricultural teachers needed more skills related to working with individuals with special needs and disabilities. In a survey provided to recent graduates of the department, these beginning teachers wished they were better prepared to work with special needs students. As a result of this finding, the department created the course with a hands on lab designed to specifically allow students to work directly with individuals with disabilities. Hopes were that students would be better prepared and more comfortable to work with these students once they become teachers.

How It Works

This lab setting was perfect for the above mentioned course, but for those universities that lack a specific course focused on diverse learners, a smaller scale version of this service learning project can be implemented in a methods course, curriculum course, FFA course, or SAE course. The first step is to identify an organization or group that allow students to spend lab sessions working with the "friends" (the particular center that we work with calls all of their participants "friends"). Our organization was found after reading an article in the local paper and the instructor contacting the center directly. During lab time, students and instructor develop small agricultural projects such as building raised beds, planting vegetables and flowers, making birdfeeders, painting, and other agricultural projects that allow students to work directly with the friends. The students work with a group of three or four friends to complete the various projects. Materials are purchased so that each participant or group is able to complete the activity. For the first two sessions, the instructor plans out the activities and explains modifications needed that will be completed by students and friends. After the first two sessions, students work in groups to develop and implement a lesson plan with modifications for the next labs. Students reflect after each lab session on what went well, changes, and their overall thoughts on what occurred.

This is classified as service learning since both the participants and friends are benefitting from the experience (Furco, 1996). These pre-service teachers learn valuable skills related to working with individuals with special needs that will one day be used in the educational setting. The friends learn lifelong skills through the activities that either benefit the center or the individual projects that are taken home by the friends.

Results

Elbert and Baggett (2003) found that prospective teachers in teacher preparation programs need to develop skills to work with disabled students. Upon reading reflections and students completing both a pre and post survey, student comfort level increased and students felt better prepared to make modifications to lesson plans and classroom activities. "I was nervous about talking and working with the friends and these individuals came up and were really excited. It sort of made me think how I should be more like that" (Student A). As an instructor, I noted that students were excited about lab sessions and truly developed a bond with the friends at the center. Student B said "When we left the center, all the friends were sad. It made me feel like I made a difference and learned a lot at the same time." Many students were like "Student B" discussing the giving back component while learning. Concluding thoughts from the past two years illustrate Bringle and Hatcher's (1996) findings that new life is brought to the classroom, the real life setting increases student interest, and teaching is more enjoyable while the learning is enhanced. The most rewarding factors were reading the reflections and seeing statements such as Student C's statement: " No one friend is similar. They all have a variety of strengths, gifts, talents, and knowledge. Realizing this made me think about all the great things these students could do in a classroom. It would be such a joy to teach them." This is what learning not only service learning is all about.

Future Plans/Advice to Others

While the center is a great location for students to work directly with the friends because of the vast differences in special needs, the instructor hopes to expand the lab sessions to include other locations. Communication has been initiated with an organization that works with students who are blind in addition to another organization that works with English as a Second Language learners.

The key to this project is finding an organization that truly values volunteers and is willing to help with the organization of activities. The center provided supplies and supervision for the friends; however, the supervisors allowed the students to be the main instructors. Because of the possibility of inclement weather, always have an alternative inside activity. A few of the organizations that were contacted saw the service learning project as more of a hassle for them; in these situations it's important for instructors not to give up because there are organizations that value opportunities for their participants. Before visiting the center, one class was spent discussing the fears of the students. Students will have fears and is important they are discussed to help decrease the nervousness of the student.

Costs

Luckily, this class does have a small budget that allows for supplies to be purchased. Overall, approximately two hundred dollars covered the cost of the materials for the entire semester. The university greenhouse and horticulture department were contacted and happily donated all of the plants that were used in the raised beds and for beautifying the center's campus. Students and departmental faculty provided the gardening tools. Students were transported to the organizations campus by university vans. Field trip locations were all free with lunches provided by the organization. The majority of the costs were all directly related to the activities; however, the instructor did spend several hours outside of the workday and personal gas money picking up supplies.

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Innovative Poster

Teach Ag! Avengers: Heroes in agricultural education recruitment

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Teach Ag! Avengers: Heroes in agricultural education recruitment

Introduction

The National Research Agenda: American Association for Agricultural Education 2011-2015 provides the context for public educational reform initiatives and establishes research priority areas for public school agricultural education. As one of its priority areas, the research agenda calls for a readily available supply of qualified workers (Doerfert, 2011). Specifically, the research priority area indicates that a need exists for: "Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century". The key outcome identified for the priority area is to prepare enough professionals for careers in agriculture; including agricultural education teachers.

As documented for over two decades (Camp, 2000; Camp, 2002; Kantrovich, 2007; Kantrovich, 2010), there is a nation-wide shortage of agricultural educators entering the classroom. Foster, Lawver, and Smith (2015) indicated that 86 full-time and 10 part-time positions were available on September 15, 2014. While teacher preparation programs may be preparing enough quality educators to fill these positions, some graduates decide to not enter the classroom. There is some disagreement on what it takes to be a quality teacher. However, there is much agreement that a quality teacher is important to providing a quality education to students (Bransford, Darling-Hammond, & LePage, 2005). First, however, individuals must know about the opportunities to become a teacher. Therefore, a need was identified for a program that empowered current agricultural education teacher candidates to become the driving force in sharing the benefits of becoming an agricultural educator. Out of this need came the Teach Ag! Avengers.

How it works

Investing in our students to further develop their skills and abilities, while leveraging peer recruitment, provides a win-win scenario. The program first needed to be branded to be identifiable by students and stakeholders. The university has an "ambassador" program and the college has an "advocate" program, thus the specific program level was named "Avengers". The primary objectives of the TeachAg! Avenger program are:

1) To effectively recruit current secondary students to major in agricultural education.
2) To effectively recruit current post-secondary students to major in agricultural education, pursue double majors or post-baccalaureate certification.
3) To serve as the representative "face" of the <University> Agricultural Education Teacher Education program at State and National Agricultural Education functions.
4) To serve as the student representative of the <University> Agricultural Education Teacher Program for college and university functions.
5) To ensure that <University> Agricultural Education has an appropriate social networking presence (Facebook, Twitter, Blogs, etc).

Selection is a competitive application process. To represent the multiple campuses of the university system and the varied points of development, program planners sought two representatives from each grade level (i.e. freshman, sophomores, juniors). All students selected must be declared AEE majors with intentions to teach secondary agricultural education.

A timeline for implementation was as follows:

August	Call for applications released
September	Applications Due

October	Interviews/Selection
November	Orientation/Professional Development
Spring & Fall	Complete Tasks/Report
Following December	Final Report Due
January	Incentive Payment made

Students are expected to create, conduct or represent at events for *<University>* agricultural education; however, only one Avenger can "claim" any event. For example: the State FFA Convention may involve all six Avengers, but only one can have credit for conducting that event. In order to receive the incentive payment, each avenger must complete a minimum of 5 events.

Results to Date

Students established a mission, vision, and set both programmatic and personal development goals for the experience. The mission developed was: "*The purpose of the <University> Teach Ag! Avengers is to cultivate awareness for agricultural and extension education."* The Vision developed was: *"Through our passion as positive agents of change, <University> Teach Ag! Avengers will empower individuals through involvement in agricultural and extension education; inspiring them to discover their career potential to influence and participate in the future of agriculture."* Programmatic goals include:

1) Conduct 30 unique events promoting AEE in the 2013-14 calendar year.
2) Involve 30 other undergraduate AEE students in the programming in the 2013-14 calendar year.
3) Establish *<University> Ag Ed on five different social networking platforms.*

All goals were accomplished. *<University>* currently has a presence on: Instagram, Twitter, Facebook, Pinterest, Tumblr and YouTube.

Future Plans/Advice to Others

<University> fully plans to continue the program in the foreseeable future. Plans include expanding the financial incentives of the program to be able to provide each student with some specific technology that would assist in them engaging students through social networks, i.e. tablet computing. In addition, further collaboration between existing student advocacy groups at the college and university level will be developed to provide professional development to the students. When designing programs like this, it is critical that the students see significant professional development benefit and it not be a one way street of benefits only towards the academic program.

Costs/Resources Needed

The primary costs related to this program are essentially a reallocation of existing funds that were earmarked for student recruitment and undergraduate student wage labor. Currently, program budget is $8,000. Each student is provided a $500 scholarship for completing five unique events over the course of the year. The remaining funds are distributed through students submitting requests for hourly wage for events at $10/hr and mileage reimbursement. In addition, some funds were set aside to provide students with brand clothing (a collared logo shirt), business cards, and professional development training each semester. Costs of attending state and national events for agricultural education youth organizations were subsidized through in-kind exchange of labor and services.

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Innovative Poster

Teach Ag! Genius Hour: Cultivating passion and innovation (#TeachAgGenius)

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Teach Ag! Genius Hour: Cultivating passion and innovation (#TeachAgGenius)

Introduction

"In the future, illiteracy will not be defined by those who cannot read and write, but by those who cannot learn and relearn" (Juliani, 2015). This educational experience was designed as a mash up of the following education efforts and initiatives to help cultivate creativity and passion in aspiring agriscience educators: TEDtalks; Genius Hour; Lightening Talks; #EdCamps; and Unconferences (Wetrrick, 2014). There is an imperative to develop agriscience teachers who can cultivate the requisite 21st century learning and innovation skills identified as the four "c's" of *creativity, critical thinking, communication and collaboration* (Partnership for 21st century, n.d.) needed in our future agriculture stakeholders. Technology has transformative effects on student engagement and our teachers need to have the digital literacy to harness that power (Pahomov, 2014). When looking at motivation, control leads to compliance; autonomy leads to engagement (Pink, 2009). This "innovative idea" addresses the question of: *How are cultivating an environment in our teacher education program that empowers ownership and autonomy of professional development and maximizes capacity to develop 21st century learning and innovation skills in future students?*

How it works

Teacher Candidates who were enrolled in a Methods course with an accompanying weekly two hour lab were selected as the first time participants in the #TeachAgGenius Hour.

Timeline

- *August 25th.* First Day of Semester. Students made aware of pending Teach Ag! Genius Hour.
- *Month of September.* As novel ideas were shared pertaining to basic course concepts, students are reminded of Teach Ag! Genius Hour.
- *October 3rd.* Student provided specific parameters for assignment. Email requesting involvement sent to following email list serves: [State] Agriscience Teachers, US Ag Ed National, American Association for Agricultural Educators, Association for Career and Technical Education Research, and [Institution] college wide faculty
- *October 7th*. Reminder email sent to digitally engaged influencers requesting involvement
- *October 8th*. First PSU Teach Ag! Genius Hour. Three sessions (aligned with lab sections).
- *October 9th.* Follow up thank you to list serves and invitation to collaborate in 2015
- *October15th.*Reflective blogs due on experiences as standard operating procedure for course.

Student Parameters of Assignment: Students were provided the following instructions one week prior to the event:

1) Prepare a 2-3 minute presentation related to education that inspires innovation that YOU want to talk about with your peers and the nation. This is YOUR mini "Ted Talk"
2) Presentations will be video recorded.
3) Tweet your "Ted Talk" idea to the #TeachAgGenius at the start of your lab session.
4) Have 20 copies of a one-page handout/learning artifact about "Ted Talk" idea.
5) Each student will present their idea in a "Lightening" talk format and we will spend the remaining time available engaging in topics via discussion.
6) Must attend assigned lab section, but you are welcome to attend as many as you wish!

Day of Implementation: On day of the Teach Ag! Genius Hour, signage was posted inviting all to participate. A table was positioned near the door to allow participants to pick up handouts and sign in. In the classroom, seating was arranged to be in a circle to promote collaborative conversation. A side project was set up to project the Twitter back channel communication to the hashtag (#TeachAgGenius). Students each presented their 3 minute "Ted Talk" to start the lab session. Following all ideas presented, students engaged with ideas (or "geeked out") in discussion: online or face to face.

Results to Date

This was implemented in Fall 2014 with 19 teacher candidates. *"It was empowering to listen to different perspectives on education and how our role as future teachers can positively impact my school, my community, and my students! All the new ideas propelled me to really think!"* –2015 Teacher Candidate; *"If you are offered a seat on a rocket ship, do not ask what seat. Just Get On."* - 2016 Teacher Candidate

Six of Eighteen Topics Shared

1) Utilizing Community Gardens to increase Civic Engagement
2) International Youth Development in Ag!
3) Placed-Based Education
4) Developing GRIT through #AgEdu
5) Instagram in Agricultural Classrooms
6) 3-D Printing in Agri Education: the #MakerMovement

Example External Stakeholders Involved Digital Conversation

Agriscience Teachers: IA, OR, PA, MI, WI
Publications: Education Week & Farm and Dairy Weekly Newspaper
Global Teacher Education
Marcellus Shale Gas Cooperative
Universities: Idaho & Iowa State

Future Plans/Advice to Others

In 2015, this experience will be further integrated into the methods course for agricultural teacher preparation as an interest approach to problems-based learning and inquiry-based instruction. Invitations will be extended earlier to hopefully engage agricultural teacher preparation programs across the nation in this asynchronous collaboration activity as a day of #TeachAgGenius. To improve potential impact, the following adjustments will be made:

1) *Timeline of Implementation:* Students will be asked to identify topics in class on Monday prior to lab day. Students will be asked to post their "Ted Talk" as a 2-3 minute YouTube video to the hashtag #TeachAgGenius by Tuesday at noon. By Tuesday at 8pm, students will be asked to have entered into a shared collaborative google document five twitter accounts of experts/stakeholders and three hashtags pertaining to the issue.
2) *Day of Implementation:* Their will be a shift of focus from "presenting" to more action work session or allowing space for innovation. Therefore, candidates will be tasked with bringing a younger AEE major (non-student teacher) to have fun engaging in the work session. Online engagement will still be encouraged with projected back-channel conversation, but candidates will be encouraged to work with personal digital devices, flipcharts, and post it notes on whichever idea they are most excited about!

Costs/Resources Needed

No additional costs and/resourced were needed beyond standard educational equipment.

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Innovative Idea Poster

Teacher Professional Development: Modules of Instruction for Students with Disabilities

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Teacher Professional Development: Modules of Instruction for Students with Disabilities

Introduction

The 1975 Individuals with Disabilities Education Act (IDEA) provided free appropriate education to all students with disabilities (Katsiyannis, Yell, & Bradley 2001). This act has since been reauthorized under the Improvement Act of 2004. The [STATE] Department of Education recently required teachers, whom apply for renewal of a Professional Certificate, to have earned 20 of their 60 professional development hours or at least one hour of college credit focused on the instruction of students with disabilities (STATE DOE, 2014).

Professional development is a continual focus for teachers as they incorporate new technologies and strategies into their classroom. Further, as teachers enhance their lessons to meet additional district and state requirements they often incorporate differentiated instructional practices. However, many teachers struggle to differentiate instruction for all learners, including diverse students (Dixon, Yssel, McConnell, & Hardin 2014). There is not a one size fits all approach to instruction, but there is a need to provide a foundation where agriscience teachers can access resources to help meet the students' needs in a responsive and supportive learning environment concerning diverse learners.

Few preparation programs provide teachers a foundation for curriculum and instruction and application for students with disabilities (Dixon, Yssel, McConnell, & Hardin 2014). Moreover, agriscience instruction presents some unique facets of instructional capacity for diverse learners. The creation of professional development tailored to agriscience teacher needs that addresses specific accommodations in the laboratory (land/agricultural mechanization/classroom) is warranted for the safety and effective instruction of learners with disabilities. To meet this need, agricultural education extension programs should provide professional development that prepares teachers through a digital framework. This will aid in offsetting professional certification requirements and further teaching expertise by providing examples in context for the agriscience teachers to incorporate specific strategies into their classroom.

How it works/methodology/program/phases/steps

Professional development modules were created based on the federal legislation concerning students with disabilities. Modules provide 20 hours of professional development or up to 3 hours of college graduate credit central to teaching students with disabilities. The asynchronous modules are designed to prepare agriscience teachers with tools and resources for differentiating instruction with exceptional students and provide in-context examples. During the modules, videos provided teachers with practical applications of the material and enable the development and implementation for the following topical areas:

- Differentiate instruction for curriculum content
- Assess and evaluate lessons
- Demonstrate various approaches
- Apply specific strategies, techniques, and methods
- Plan and implement individualized instruction

- Assessment and instructional planning
- Teaching procedures

The consistent need of agriscience teachers understanding of effective and beneficial instruction of students with disabilities caused for the creation of the modules. Instructional time is dedicated to focusing on how agriscience teachers could effectively instruct and implement strategies for learners with disabilities into their classroom and laboratory settings. Teachers are required to complete various modules that incorporated technology as they became better prepared to properly facilitate learning with students with disabilities that are unique to agricultural education settings.

Modules contain background information on the topic, effective strategies to utilize in a learning context, video segments of effective use of strategies, assessment of outcome measures, and additional resource links for supplemental learning. Specific modules developed/in development to maximize students' potential and engagement in the agriscience classroom are: history/background/federal regulations, autism spectrum disorder, deaf or hard or hearing, dual sensory impaired, emotional/behavior disability, intellectual disability, language impairments, orthopedic impairment, other health impairment (ADHD, Asthma, ADD), specific learning disabilities (dyslexia, dysgraphia), speech impairment (fluency, phonemes, voice), traumatic brain injury, and visually impaired. Once the modules have been completed teachers showcase adaptations to lessons plans based on their actual learners within their classroom. Feedback is provided by the course/module instructor. Once final feedback is provided, college credit (in the form of a letter grade) or a professional certificate indicating 20 hours of professional development in the area of instruction of students with disabilities is awarded.

Results to date/implications

Anecdotal evidence suggested that teachers who have completed modules are more comfortable with and prepared to facilitate, demonstrate, and instruct students with disabilities in classroom and laboratory settings. Further, the teachers are providing a highly effective responsive environment that meets the needs of diverse learners and enhances student learning potential. Agriscience teachers suggest that learning through an online self-paced system meets their professional development needs and is cost effective.

Future plans/advice to others

Further professional development on specific topics that have a state-wide impact in the educational community should be examined through an online application with faculty feedback on implementation into local school-based programs. The online submission and feedback aids in the connection of teacher education faculty to maintain relevance and connections to agriscience teachers throughout the state. Furthermore, the connections lead to better working relationships between the university, department, and the agriscience teachers.

Cost/resources needed

Resources needed to complete the professional development modules include: website capability (design and delivery), identification of topical areas, teachers and faculty feedback on effectiveness during development, district feedback to ensure modules address needs, and video equipment.

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The Five Essential Elements of Supervised Agriculture Experience Programs

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The Five Essential Elements of Supervised Agriculture Experience Programs

Introduction/Need for Innovation

Supervised Agriculture Experience (SAE) programs can have extensive educational and motivational value (Phipps, Osborne, Dyer, & Ball, 2008), but the focus of SAE has shifted from production agricultural experiences to more broad applications in and about agriculture. "Understanding Agriculture: New Directions for Education" outlined a direction for SAE that includes SAEs with more diversity.

SAE involvement varies widely among individual programs, but does not reach the goal of having every student involved in a SAE project. Historically, student SAE participation ranges from around 30% in New York (Penrod, 1985) to 68% in Florida (Arrington & Price, 1983). More recently Lewis, Rayfield and Moore (2012) reported that 46.1% of students in their study had an SAE project. Wilson and Moore (2007) found that less than one third of North Carolina agriculture teachers had more than 75% of their students participating in a SAE program.

One of the reasons for the lack in SAE participation may lie in the teacher's ability to convey the concept of an SAE project to students (Osborne, 1998). Some criticisms of SAE projects is the lack of definition for SAE, and that the focus has not shifted from production-oriented practices as quickly as the classroom/laboratory instruction and FFA components of school-based agricultural education (SBAE) (Dyer & Osborne, 1995). Bird, Martin, and Simonson (2013) articulated the need for a shift in the focus of SAE by stating

> Practitioners should strive to help students realize the value of SAEs as a means to learning knowledge and career skills within an agriculture context that can be later transferred to contexts beyond agriculture. Simply put, educators should help students find value in SAEs beyond a plaque and a paycheck (pg. 42).

Jenkins and Kitchel (2010) recommended agriculture teachers should help students form SAE goals to guide each student's program. Robinson and Haynes (2011) highlighted the importance in identifying how agriculture teachers are evaluating programs. According to goal progress feedback theory (Hattie & Timperley, 2007), part of the theory of social cognitive theory (Bandura, 1986), when individuals cannot obtain reliable information on their own, feedback from others can raise self-efficacy, motivation, and eventually lead to goal achievement. The purpose of this work is to provide a model to agriculture teachers to guide students as they develop goals for their own SAE program and assist students and teachers evaluate SAE programs with the overall goal of increasing the quality of students' SAEs.

How it Works: Explanation of the Model

To accomplish this goal, the "Five Essential Elements of Supervised Agricultural Experience Programs" are identified, operationally defined and placed on a continuum. The instrument is intended to be a tool for agriculture teachers to have a dialogue with their students about the current status of their SAEs and how they can set goals and make improvements to their SAEs.

It is not intended to be an evaluative tool to grade SAEs in its current form. However the model could be adapted to serve the purpose of evaluation and allow teachers to grade SAEs.
The five essentials of a SAE are based on the 16 assumptions about SAE reported by Barrick and Estepp (2011). What makes these five assumptions unique is amount of autonomy the student has over these factors in their SAE program. The other 11 factors are recommendations for the teacher. The Five Essential elements of a SAE programs are technical skill acquisition, level of commitment, size and scope, life skill development, and money earned/invested.

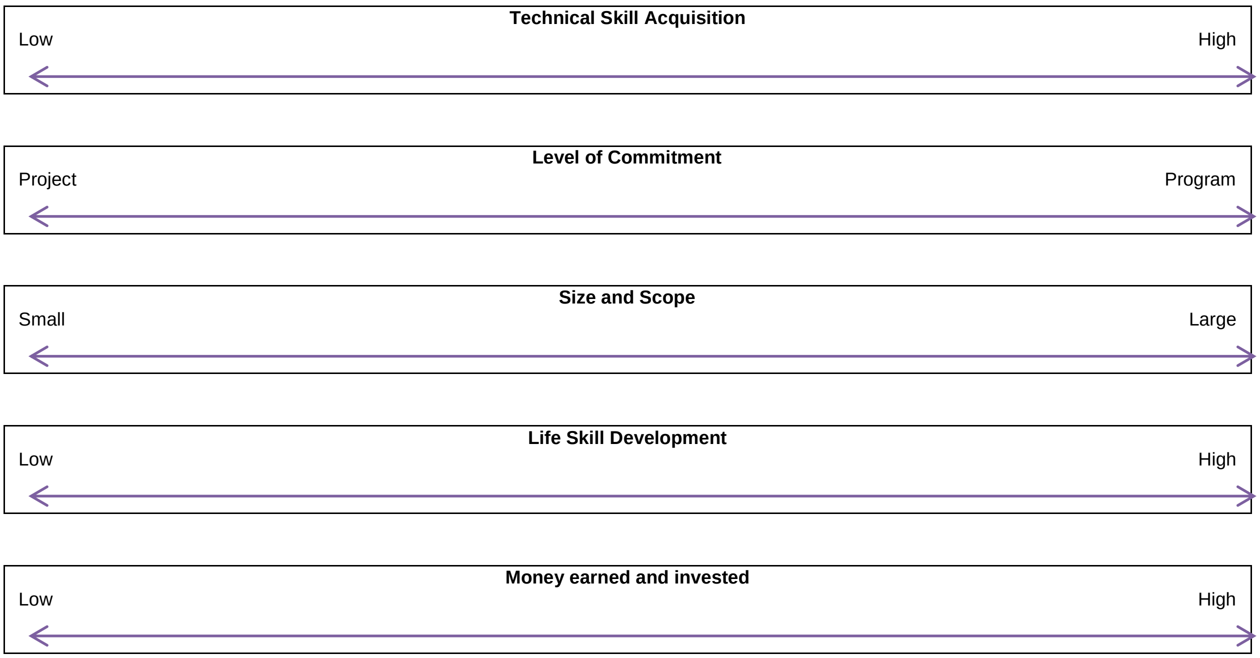

Figure 1. The Five Essential Elements of SAE Programs

Results to Date
The model was presented to a preservice agriculture teacher education course at the University of Florida. The students in the course expressed frustration with the idea of implementing SAE for all students. Some of the students' frustrations were alleviated after the model was explained. According to one student, "I think the model is great, I think I will use it to have students rate their own SAEs before I do a visit and we can have a conversation about ways to improve their SAE." Another student claimed. "I like the model because it shows that not every student has a perfect SAE, but they can improve in their SAE." She added as a criticism, "I wish it were a rubric that I could use to evaluate their SAE's, but I see why that is difficult."

Future Plans/Advise to Others/ Resources Needed
The SAE model will be presented to various professional groups so the authors can receive feedback and input from a variety of professionals in the field. The final model will be published in the Journal of Agricultural Education as part of a philosophical paper about student goal setting in SAE. Teacher educators and individuals involved in professional development will be encouraged to use the model to explain SAE goal setting to in-service and pre-service teachers. The model is a free resource for SBAE teachers and teacher educators to use to explain the important elements of SAE. To complete this project funding will be required to design a

visually effective version of the model. Funding will also be needed to provide professional development to agriculture teachers.

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Poster Type (Innovative Idea)

Using Google Analytics to Assess the Use of Online Resources in Agricultural Education

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Using Google Analytics to Assess the Use of Online Resources in Agricultural Education

Introduction/Need for Innovation

Agricultural education continues to be ever changing and adaptive in nature. Correspondingly, agricultural educators must learn to adapt and adjust to changing technology and teaching methods. This reality, in tandem with Priority 2- Technologies, Practices, and Products of the National Research Agenda of AAAE, encourages the profession to look for new, innovative approaches to deliver the viable content of the industry. In July of 2014, a new, progressive agricultural education online resource called "Explore SAE" was launched. Assessments of innovative resources are typically completed through survey analysis; however primary data on how users accesses and utilize the online system may offer greater insight.

How it Works/Methodology

According to Google Analytics, this service "generates detailed statistics about a website's traffic and traffic sources, measures, conversions and sales" (2015). The service collects data by storing some basic information from a user. Whenever an HTTP request occurs on a search, information is collected through JavaScript, the programming language and the code of the web. This information typically includes items such as the computer making the request, the hostname, the browser type, and language (Google Developers, 2015). Google analytics takes this information and stores it into a server. From here, the data is analyzed and interpreted to address a specific aspect of a web page. Some of the metrics that Google Analytics captures that may be useful to agricultural education online resources are browser use, duration and views of specific pages, overall page views, and seasonality. Website managers can use analytics to determine specific factors of website use and develop improvements for both use and navigation. The intent of the researchers is to utilize Google Analytics as an innovative evaluation tool for online resources within agricultural education, using Explore SAE as the context. Specifically, these Google Analytics relate to Explore SAE program stakeholders by providing insight on who the individuals are visiting the website, what specific SAE resources and pages are being utilized and when the website traffic seems to be in the most demand. According to Explore SAE, part of its vison is to "offer educational resources to assist agriculture instructors in connecting student interest to SAE opportunity" (2014) Through the use of Google Analytics, the creators of Explore SAE can collect and interpret data that describes the usage of the online resource, audience, and user behavior.

Results to Date/Implications

Usage of Online Resource

Since the websites inception in late July of 2014, Google Analytics reports that Explore SAE has received 205,371 (65.04%) unique page views (the number of individual users who have looked at the webpage, and does not include repeat users) with total views topping out at 278,577 (69.68%). This measure is important to determine growth and reach with new users to the website. Additionally, use of page and duration on page is an important factor for the Explore SAE creators to assess. From the data collected since the websites launch, we determined that the most views occur on the home page (15.58%), as compared to where the most time is spent which occurs on the SAE Resource page (2:03 minutes).

Audience

Similarly, the users of Explore SAE were described as 68.36% new users and 31.64% returning users. Also, Google Analytics reports that 81.68% of the viewers of Explore SAE view the site from a desktop computer versus a tablet (10.43%) or mobile device (7.89%). Additionally, browser use is an important factor to insure web and computer compatibility with Explore SAE Users. By understanding the user's browser preference, the web manager can better meet the compatibility needs of the user. The following browsers were most commonly used by Explore SAE users: Google Chrome (46.06%), Internet Explorer (22.69%), Safari (18.60%), Mozilla Firefox (10.38%), Android Browser (0.96%), and Other browsers (0.71%).

User Behavior

Furthermore, seasonality is an important factor to evaluate. The peak uses of Explore SAE occurred on September 7, 2014 and January 4, 2015, with the greatest range of views occurring in late August through mid-October which offers insight into second use. It can be determined that use of the resource occurs at the beginning of school semesters and much of the access is seen on the SAE builder tool, a resource that helps students determine what kind of SAE best meets their interests. The researchers also determined that there is little difference in duration and views among the four SAE categories users can learn more about. Perhaps this is an indication that when instructing students on SAE, or students self-exploring SAEs, the website helps deliver a balanced approach to category content.

Future Plans

Explore SAE creators and program stakeholders will continue to utilize Google Analytics. Important data and user demographics can be gained from utilizing the statistical analysis that Google Analytics provides. Using this innovative evaluation system will help determine what locations on the website are most utilized and explored by the users of Explore SAE. On the other hand, pages that do not receive as much web traffic or views can be evaluated to determine effectiveness and usefulness to the agricultural education instructors and students who utilize this online resource. Furthermore, Google Analytics can be used to evaluate other necessary online resources within the profession. These may include different sections of the National FFA website, searches for articles in the Journal of Agricultural Education, and a variety of other online teaching resources such as Instructional Material Service (IMS), MYCAERT, and CEV Multimedia. More research should be conducted to determine how Google Analytics can be useful to online resources within the profession and how this data compares with other web searches across the discipline and beyond. Perhaps research can be conducted concerning duration time on a page as it relates to SAE knowledge retention. Google Analytics may also help in professional development efforts to determine what online resources agricultural education instructors most often request.

Cost/Resources Needed

Google Analytics is a free service to owners of a specific web domain. It can be accessed by the manager or creator of the website. Analytics reports are continuously updated and evaluated to provide evaluators with the most recent data to most effectively manage their web domain. Signing up for Google Analytics is a simple 3 step process involving signing in with a google account, providing some basic demographic and contact information, and providing the website address on which Google Analytics will conduct statistical analysis.

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Poster Type: Innovative

Utilizing Celly Technology to Encourage Student Participation in an Undergraduate Agricultural Education Classroom

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Utilizing Celly Technology to Encourage Student Participation in an Undergraduate Agricultural Education Classroom

Introduction/Need for Innovation

The use of mobile technology has great potential in the realm of higher education (Engel, Palloff, & Pratt, 2011). "Technology provides the means for students to take responsibility for their choices in relation to participation in the teaching and learning interaction" (Richard & Lenarcic, 2007, p. 676). The usage of mobile phones is high among students and does not seem likely to change (Richard & Lenarcic, 2007). Strong, Irby, and Dooley (2013) found that most students coming into higher education already have a wealth of knowledge and experience as well as positive outlooks towards mobile technology.

One of the major problems in academics is, "how to remind students using technology to increase the uptake of curriculum resources outside of the traditional classroom" (Richardson & Lenarcic, 2009, p. 844). SMS (short messaging service) technology can be used in education as a means of assisting students with vital skills such as time management, self-organization, and information management and communication (Richard & Lenarcic, 2007). SMS text messages are generally short and simple which is more preferred by current generations (Richardson & Lenarcic, 2009). *Celly* is a technology which can be used to encourage student interaction and participation in and out of the classroom by utilizing SMS text messages, iPhone/Android app features, and internet access to send reminders to students.

How it Works/Methods/Steps

First, a unique account name, or cell, must be created with *Celly*. There are a couple of account options for educators so it is important to understand your teaching situation and style in order to choose the package best suited for you and your class. There is a free account which allows for an unlimited number of members and 1000 SMS texts per month per cell (cel.ly, 2011). After creating an account you can choose to make it an open or private cell as well as a curated, open, or alert-only chat (cel.ly, 2011).

Secondly you should invite students to join the cell by having them text *Celly*'s number, 23559, with a message containing the unique cell name (cel.ly, 2011). If the cell is set-up as a private cell a request will be sent to you asking permission for the students to join (cel.ly, 2011). Once permission is given, *Celly* will use text prompts to guide students through their initial set-up in the system by having them create usernames and preferred method of receiving messages.

Third, you should begin scheduling notifications through the online website. You can schedule polls and reminders to be sent out at a certain time and date (cel.ly, 2011). After the messages are scheduled, you are able to see the messages in order, edit, and/or delete messages if there is a need to do so before it is sent out.

Results to Date/Implications

Celly was utilized in AIS 3333, Presentations in Agricultural and Life Sciences, during the Spring 2014 semester. This course utilized a flipped classroom approach that required students to watch recorded lectures via PowerPoint and complete assignments before each class. This allowed the instructor to facilitate classroom activities, student presentations, and in-depth discussions of concepts students learned prior to class. The course consisted of 25 undergraduate students and was delivered in a traditional classroom format.

The students were introduced to the technology at the beginning of the semester by having them to send a text message to *Celly*'s phone number, 23559, containing the course's unique cell name, @PresentationsS14. Once the students were given permission to join (private cell only), the system prompted the students through text messages to create usernames and preferred style of receiving notifications. A "test" question was used to ensure they could receive messages.

Celly was utilized throughout the semester to send reminders to students about assignments, due dates, as well as any upcoming presentations. *Celly* was also used for students and instructors to correspond quickly through private messages. Mid-semester, students were given a short questionnaire asking how useful they perceived *Celly* to be and for suggested improvements. Students responded very positively to the technology and the only request received was to send the reminders out earlier. The messages were being sent at 5:00pm the day before class, so we changed the time to 10:00am the day before class.

The students completed a second questionnaire at the end of the semester that asked how helpful *Celly* had been in reminding them of assignments, reaching the instructor outside of class, changing the time of the reminders, and if they would recommend *Celly* to other teachers. Students responded with very positive feedback and indicated they did find *Celly* helpful in reminding them of due dates and reaching the instructor. They also indicated changing the time was very helpful and they would also highly encourage other teachers to utilize *Celly*.

Future Plans/Advice to Others

It is recommended that instructors utilize the *Celly* app for sending/receiving messages and utilize the *Celly* website to schedule reminders. Instructors should be aware that *Celly* updates often. If you are using the *Celly* app, it will need to be updated throughout the semester in order to utilize new/updated features. Also, if a cell is being curated, responses from students will only be received by the curator and admin. The rest of the group will not see the message. Instructors also need to be cognizant of which cell they are sending a message too. It can be easy to send a message out to the whole class when you meant to send a message to just one student.

Costs/Resources Needed

There are three options for purchasing a *Celly* account. The *Celly* Basic package is free, the *Celly* for Leaders package is $15 per month (only $5 for k-12 educators), and the *Celly* for Enterprises package is customized pricing for larger organizations (cel.ly, 2011). All three packages allow an unlimited number of members and scheduling of polls and reminders (cel.ly, 2011). *Celly* Basic provides 1000 SMS texts per month per cell and unlimited messages to members with the *Celly* app, email, or web (cel.ly, 2011). *Celly* for Leaders allows the creation and tracking of quizzes, better scheduling, and more poll options (cel.ly, 2011). *Celly* for Enterprises provides mass alerts and enterprise integration (cel.ly, 2011). For a typical college classroom most instructors would do well with the *Celly* Basic option. Instructors and students will need to have one of the following in order to utilize *Celly*: a cell phone (with SMS capabilities), smartphone (for *Celly* app and SMS texts), or Wi-Fi/internet access if a cell phone is not available.

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Utilizing Endowment Funds to Enhance Community Viability

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Introduction

Rural communities in the United States are historically vulnerable areas; often underfunded, underserved, and underdeveloped. The current federal funding gap between metropolitan communities and rural communities negatively affects development opportunities in those rural communities. Three years ago17.7 percent of people in rural areas were living in poverty, compared to the 14.5 percent in the metropolitan areas (Farrigan, Hertz, & Parker, 2014). Poverty in rural areas affects how the general public views those communities, often the tone of reporting about rural areas is that of disparity, rarely are there reports of positive development and economic growth (Kellogg Foundation, 2003). This lack of federal funding is causing local youth to move away, this causes a decrease in local leadership, economic development, and rural advocacy (Rural Youth Assembly, 2014). Youth are the future leaders of their communities, they have a unique perspective of understand what the community's needs are, it is important to community survival that they become local leaders (Ricketts & Place, 2009). To aid in rural community viability and rural advocacy, there must be partnerships between communities and institutions such as land grant universities, as well as rural agricultural industry. This type of partnership will improve economic development, local leadership, and create opportunities for youth and grassroots development organizations (Cooper, Kotval-K, Kotval, & Mullin, 2014).

In 2003, an anonymous donor contributed 2.2 million dollars to the Virginia Tech College of Agriculture and Life Sciences to establish a fund to enhance community viability in Virginia. The fund established an endowed chair in the college and generates operating funds intended to be used to enhance community viability. Since the inception of the endowment, the chair and the college have used the funds to establish programs such as the Virginia Agricultural Leaders Obtaining Results (VALOR), Leadership training for community government, and many other small projects.

How It Works

In 2014, the Community Viability Grant funded 5 initiatives that "leverage local agricultural partnerships to enhance community viability". Faculty in CALS (College of Agriculture and Life Sciences) as well as the larger community including agricultural businesses and extension could submit proposals for funding. Funded projects addressed essential community principles to enhance regional viability such as, building strong community leaders, addressing food security issues, supporting community food systems, and enhancing youth and adult education. The projects are tied into CALS research and resources, agricultural industries, and communities throughout Virginia.

Five proposals were awarded between $20,000 and $23,000 in October 2014. The projects chosen met the funding priorities in innovative and unique ways. The projects will be completed by fall 2015. The five projects include: Harrisonburg EATS (Everyone At the Table): A Food Systems Assessment and Planning Project for Harrisonburg City and Rockingham County; Food for Thought: An Edible Education Partnership Enhancing Programmatic Efforts through Involvement with CALS; Graduate Extension Scholars Pilot Program: Preparing the Next Generation of Agricultural Scientists to Engage in Quality Outreach; Creating a Regional Food

Systems Roadmap: Building a Multi-State Network and Leveraging Area Resources; Leadership Discourses for Community Partnerships.

These rural issues resonate with the Agricultural, Leadership, and Community Education (ALCE) department at Virginia Tech and its objectives as an educational department. The ALCE department seeks to enhance the lives of Virginia residents, support Virginia agriculture, and improve the vitality of our communities. In this vein of community service it was seen as essential to provide funding for projects that address rural community viability issues. The Virginia Tech Community Viability Grant is an innovative idea to promote partnerships between communities, the College of Agriculture and Life Sciences (CALS) at Virginia Polytechnic Institute and State University, and Virginia agricultural industry to achieve community viability. The Community Viability funding priorities are projects that address: rural quality of life, grass-roots advocacy, give rural communities a stronger voice, promote rural organization involvement, and help create ways to retain young rural talent.

Implications

Communities that are involved in the funded initiatives are already being positively impacted, and strong ties are forming between CALS, communities, and agricultural industry because of the Community Viability Grant. More importantly, these initiatives are creating community capacity that will help make sustainable changes for communities and their residents. Long term improvements in economic development, local leadership, and community food systems will enhance community vitality, and enrich the Virginia Appalachian region in positive ways.

Benefactors expect that the funds generated through endowments be utilized to meet the goals of the donor and the institution. Utilizing these funds to meet those needs continues to express the college and departments’ commitment to meeting the benefactors’ expectations. The benefactor is pleased with the use of the endowment.

This grant program model can be used by other universities or funding agencies to support and encourage development in other rural areas. The funding priorities of this grant are relevant to most rural communities, and this opportunity fosters creative solutions to community issues, and it improves the relationships between university, communities, and agricultural industry.

Future Plans

The Community Viability Grant will be offered again in coming years, and will continue to positively impact Virginia. There will also be a comprehensive evaluation of the grant and the funded initiatives to help make possible improvements and enhance the overall process.

Funding information

$109,000 for proposal funding with the expectations that funded programs will match 100% of the funds given. Matching resources can include personnel time, funds from other sources, and in-kind contributions.

Resources

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Innovative Idea

Utilizing GradeCam to Foster Immediate Feedback for Learners

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Utilizing GradeCam to Foster Immediate Feedback for Learners

Introduction

Conoley, Croom, Moore, and Flowers (2007) described effective teaching as the "process of setting instructional goals, conducting a series of processes to accomplish these goals, and assessing how the goals are accomplished" (p. 67). Assessment is a vital component of the educational process (Epstein et al., 2002). Providing feedback in the assessment phase allows students to gauge their performance and offers suggestions for improvement (Conoley, Croom, Moore, & Flowers, 2007). When presented with a multiple-choice type of assessment, students prefer immediate feedback (DiBattista, Mitterer, & Gosse, 2004).

Several methods exist to provide immediate feedback to students on assessments. Web 2.0 technologies can be an effective tool for providing immediate feedback. Grosseck (2009) concluded that utilizing web 2.0 technologies is advantageous because of the reliability in continuous usage, and a reduction in time and energy spent on managing information. Furthermore, Trilling and Hood (1999) concluded that student learning was enhanced with the utilization of telecommunication hardware and software. [University] provides a bubble sheet service, where assessments are completed, sent to a testing building and graded. Results are returned within one week of submission to the bubble sheet service. This option hinders the process of providing immediate feedback to students. Scantron$_{TM}$ machines can also be used but are bulky and would need to be carried to the classroom anytime a multiple-choice assessment was administered. The abundance of favorable research regarding immediate feedback to students led the instructor of AgEdS 450 at Iowa State University (ISU) to employ a web-based grading system known as GradeCam$_{TM}$.

How it Works

GradeCam$_{TM}$ can be utilized via a smartphone/ tablet application or on a computer with a document or web camera. GradeCam$_{TM}$ allows instructors to quickly and accurately grade multiple-choice assessments. Furthermore, it provides an item-by-item analysis of correct and incorrect answers, various graphical representations of responses, and a student grade report. Table 1 outlines the steps to creating a GradeCam$_{TM}$ account to begin providing immediate feedback on multiple-choice assessments.

Table 1.

Steps to Setting Up a GradeCam$_{TM}$ Account

Step	Activity	Description
Step 1	Create an account	Go to www.gradecam.com and sign up with a valid email account.
Step 2	Import students	Upload a CSV file with student ID numbers, first name, and last name.
Step 3	Print forms	Print blank forms or forms pre-filled out with student information from the website.
Step 4	Create an assessment key	Input the key to your multiple-choice assessment.

Step 5	Scan the assessment	Hold students completed forms in front of your smartphone/ tablet camera or a web/ document camera.

Results to Date

The free version of GradeCam$_{TM}$ has been utilized in AgEdS 450 at ISU for two semesters. GradeCam$_{TM}$ has eliminated delayed feedback on assessments and student grades are distributed by the end of the lecture period. After forms have been scanned by the GradeCam$_{TM}$ program, grades are immediately input into Blackboard Learn by the teaching assistant. Students have expressed satisfaction with the technology and appreciate the timely feedback. Students have stated that it allows them to keep track of their standing in the course.

Future Plans/ Advice to Others

The instructor for AgEdS 450 at ISU plans to upgrade to the paid GradeCam$_{TM}$ account next semester. When this upgrade occurs, the instructor will be testing the efficiency of uploading grades directly into course management systems (i.e., Blackboard Learn). Many university policies regulate the use of student identification numbers. It is recommended that care be taken in using full university identification numbers for students. Using the random number generator in Microsoft Excel may provide an effective way to eliminate the need for university provided student identification numbers.

Costs/Resources Needed

GradeCam$_{TM}$ can be used for free with limited capabilities. Two payment plans are offered through GradeCam$_{TM}$ and include; 1) $15 per month per teacher, or 2) $2.50 per student per year. The plans that cost money offer features such as importing grades into course management systems (i.e., Blackboard Learn), and integration of state or custom standards. If utilizing a smart phone or tablet for GradeCam$_{TM}$, data charges may be incurred that will vary based on provider. A document camera will be needed if the computer being used does not have a webcam built in. If a computer is being used and it does not have a built-in webcam, a document camera or similar product will be needed.

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Utilizing industry experts to enhance the agricultural mechanics instruction

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Utilizing industry experts to enhance agricultural mechanics instruction

Introduction

Agricultural Education teachers are expected to be competent in all content areas within agricultural education. However, agricultural education teachers continue to identify agricultural mechanics as a content area where additional training is needed (Shultz, Anderson, Paulsen, & Shultz, 2013). Burris, McLaughlin, McCulloch, Brashears, & Fraze (2010) indicated that agricultural Education teacher's confidence in teaching agricultural mechanics increased with experience. In order to increase confidence, a week long agricultural mechanics workshop was developed following the format utilized by Laboube, Burris, & Kitchel (2004). However, some issues that teacher education institutions may run into include the lack of expertise among faculty and access to tools and equipment that might be housed in other departments. The purpose of the workshop was to partner with industry leaders to assist beginning teachers develop the fundamental skills and management strategies to be successful in the operation of an agricultural mechanics laboratory.

How it Works

The instructor of the workshop started the process by identifying the essential agricultural mechanics skills that are critical for beginning teachers to possess as educators. An agricultural mechanics needs assessment was conducted to identify the areas of need among beginning teachers. After completion of the needs assessment the instructor needed to identify the companies that specialize in those content areas. In order to provide adequate instructional time and maximize the content areas covered the workshop was designed to cover one topic area per day over a five day span unless two topics could be covered in one day. For example on day one the teachers participated in an introduction to laboratory safety in the morning and a mock agricultural mechanics career development event (CDE) in the afternoon. The four skill areas tested in the mock CDE were aligned to the content areas that were being introduced on Days 2-5. Day Two focused on woodworking, Milwaukee tools provided a representative who covered the entire line of Milwaukee tools including tools that had not reached the market yet. The rep also demonstrated safety and proper use of each tool before the students were able to use the tools in the morning session. In the afternoon, the teachers were responsible for constructing a small woodworking project using the tools and equipment that was introduced in the morning session. The morning session of Day Three the participants received instruction from a local precision farming business focused on surveying and global positioning systems (GPS). The teachers then received instruction on basic electrical principles and applications in the afternoon session. Day four focused on welding; the participants received intense instruction on GMAW, SMAW, GTAW, and O-A welding processes. Lincoln Electric provided two instructors who covered two processes each in the morning and two processes each in the afternoon. Participants were broke into two small groups to get additional hands-on experience throughout the day. On Day Five, Briggs and Stratton provided three industry representatives to provide instruction on the introduction to small gas engines. The representatives also lead the participants through the tear down and reassembly process associated with small engines. Upon completion of the rebuild, the teachers were able to take their engines home.

It was critical to partner with industry leaders because the host institution did not have access to an adequate supply of tools and equipment at the time of the workshop. Additionally, the industry leaders provided instruction that meet industry standards. Most industry partners also provided additional equipment, tools and other teaching materials for the participants to utilize in their classrooms. Majority of the companies provided at least two representatives from their training department to deliver up-to date technical content in their respective fields. Some examples included Briggs and Stratton who provided three representatives, small engines and all of the tools necessary to disassemble and reassemble overhead valve small engines along with curriculum and teaching aids. Lincoln Electric provided two instructors, welders, and consumable materials along with curriculum and other teaching aids.

Once the topics had been identified, industry commitments had been secured and a calendar of instruction set, the next step in the process was to advertise for the workshop. A flier was developed and emails were sent across the American Association of Agricultural Educators, National Association of Agricultural Educators, and State teachers association listserv. The fiscal technician at the host institution handled registration and billing. A workshop fee of $500 could be charged to either the participant or the participants' school. Enrollment for the workshop was capped at 24 participants and it was filled on a first paid, first served basis.

Results to Date

The results of this workshop reinforced the results from Burris et al. with the confidence level among the students improving significantly over the course of the week. Several participants noted they would integrate several of the topics into their curriculum which they would not have taught prior to taking the course. Informal evaluations indicated that all of the students would enroll in the course if they had the opportunity to do it again. The participants' also highly recommend the course to other beginning teachers. The university has also been able to strengthen their ties with the industry leaders who were represented during the workshop. Several representatives have assisted in acquiring equipment for the department to enhance instruction. In the past two years the teachers have been able to take home over $30,000 in equipment, tools and other teaching materials to utilize in their classrooms.

Future Plans

The instructor has been in contact with additional industry leaders to provide training using their instructors and provide their equipment. The instructor intends to rotate topics on biennial basis in order to integrate multiple agricultural mechanics content areas within the workshop.

Costs/Resources Needed

The only cost to the host institution is the instructor's stipend. It is recommended that the host institution provide an agricultural mechanics laboratory or similar facility with proper electrical outlets and ventilation necessary for the topics covered. The companies that have agreed to participate in the workshop have provided state of the art equipment, tools and consumable products needed to conduct the training.

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Poster Type: Innovation

Who provides? Ag Provides: A Social Agricultural Awareness Campaign

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Who provides? Ag Provides: A Social Agricultural Awareness Campaign

Introduction/need for innovation or idea

Throughout the twentieth and twenty-first century, the world has seen a transition into a global urban society that is removed from the farm (Vilsack, 2014). Vilsack (2014) reported less than two percent of Americans are engaged in farming as their primary profession. The movement away from the farm has led to a decreased knowledge and understanding of the complexities involved in agricultural systems (Doerfert, 2011). However, consumer knowledge of the agricultural industry is imperative (Vilsack, 2014; Doerfert, 2003). Production needs, widespread urbanization, and policy changes are issues affecting agriculture (Kovar & Ball, 2013). The public must have an understanding of the agricultural industry to make sound voting, policy, purchasing, education, and career choice decisions (Doerfert, 2003).

The rise of urbanization in the United States, with less knowledge of agriculture, creates a need for an agricultural education entity to inform the general public about agricultural issues. Agricultural literacy can be defined as the "understanding of the food and fiber system [that] includes its history and current economic, social, and environmental significance to all Americans" (National Research Council (NRC), 1988, p. 1). The first research priority of the National Research Agenda, for the American Association of Agricultural Education (AAAE) is "public and policy maker understanding of agriculture and natural resources" (Doerfert, 2011).

In order for agricultural educators and communicators to educate the general public of agricultural issues, a platform must be created to reach a large audience. Although scholarly work is disseminated on these issues, it is questionable on how much of a message reaches the general public. Kovar and Ball (2013) recommended agricultural education research needs to place a priority on publishing research "utilizing specific agricultural literacy terminology in non-agricultural education and to market their findings" (p. 174). One possible solution to connect with the public is social media. Social media can be used to disseminate information to the public (Comm, 2009), and it can be used to generate a two-way conversation to engage the public in the topic (Jenkins, Ford, & Green, 2013).

Agricultural educators and communicators need to harvest the potential of social media to disseminate information about the agricultural industry. The importance of Ag Provides is its ability to inform the public about food, fiber and increasing agricultural literacy. This ongoing campaign sought to develop platforms that could be trusted by the consumer about the food and fiber products used by the consumers. Other institutions and organizations will be able to utilize the Ag Provides campaign in their communities, to educate the public on agricultural issues, and to increase the general consumers' agricultural literacy.

How it works/methodology/ program phases/ steps

Ag Provides was comprised of many facets, including Facebook and Twitter platforms, community service initiatives, and educational materials. Before initiating the campaign, the Ag Provides developers at Texas Tech University, contacted universities, high schools, and agricultural organizations around the nation, to further widen the audience reach. The schools and organizations which agreed to join the campaign were sent a media kit, including educational materials (i.e., how to get started guide, press release template, agricultural fact sheet, social media images, and food drive campaign information) to kick off their campaign. Next, an Ag Provides Facebook page and Twitter account were created and established on September 9, 2014. Social media provided an avenue for dissemination of information as well as evaluation through analytical tracking.

The Ag Provides campaign began on September 9 and concluded on October 2, 2014. During the duration of the campaign, a total of 58 informational posts were included on the Facebook page to educate the audience about agriculture in an unbiased manner. Along with the information provided by Ag Provides on social media, the campaign also encompassed a food drive. The food drive, ending on October 2nd, sought to counteract the effects on food prices affected by the animal activist campaign, "Fast Against Slaughter." The food collected by the various organizations and institutions involved in this campaign were donated to food banks in their communities.

Results to date/ implications

To benchmark the reach and success of the program, analytic tools were utilized to assess the social media domain and the food drive donation amounts were tracked. Universities involved in the Ag Provides campaign included Blinn Community College, Fort Hayes State, Iowa State University, Kansas State University, Mississippi State University, Oklahoma State University, Penn State University, South Plains Community College, Texas A&M University, Texas Tech University, University of Arkansas, University of Florida, University of Kansas, Utah State University, and West Texas A&M University. In regard to social media results, over 23,000 people were reached organically throughout the duration of the campaign. Over 20 countries were reached by the Ag Provides Campaign, with the most social media activity recorded in United States, Canada, Mexico, Ecuador, and Nicaragua. Texas, Florida, Kentucky, and Oklahoma were the states which recorded the highest levels of social media campaign activity. The date with the most social media activity was October 2nd, with 29,424 reached, both organically and through boosted posts, 419 likes, and 159 shares. With no plausible way to track the reach of shared social media, it can be implied the reach of Ag Provides was even larger than reported in this study. In regard to the amount of food collected for this campaign, approximately 1,000 pounds of food were collected at Texas Tech University, and the surrounding areas.

Future Plans/advice to others

To increase the agricultural literacy of Americans and the reach of this campaign, the Ag Provides Campaign will be held annually. To expand the campaign in the future, a website will be developed. Based on the response (e.g., likes and shares on Facebook) to the posts on social media, more informational posts will be developed before the next campaign. To increase the amount of informational post designed for the Ag Provides Facebook account, it is recommended that partner universities and organizations take an administrate role and contribute to the social media sources. To gauge the success of the campaign (e.g., activity on social media and amount of food collected), it is recommended that a campaign-wide recording system be implemented.

Costs/ resources needed

Generally, establishing social media platforms are not associated with any monetary cost with an exception of boosted post. The largest cost associated with this campaign is human labor which includes time spent creating and maintaining the social media, collecting the food donations, and delivering food donations to the local food bank.

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Poster Type: Innovation

Word-Phobia: Using Writing Apprehension as a Learning Tool in Agricultural Communications Classrooms

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Word-Phobia: Using Writing Apprehension as a Learning Tool in Agricultural Communications Classrooms

Introduction and Need for Innovation

Written communication skills are imperative in any field chosen by a college graduate; however, college graduates struggle to complete written communications proficiently (Belkin, 2015; Leef, 2013). Job candidates are failing to learn basic intellectual skills such as written communication in their current university curriculum (Belkin, 2015; Leef, 2013). In an effort to help improve students' writing skills, curriculum must be structured around emphasizing the importance of proper written communication (Lea & Street, 1998). While instructors might stress these skills, students may show a lack of motivation or confidence to write (Lea & Street, 1998). Writing Apprehension (WA) is one of the main factors hindering students' motivation and confidence to write (Lea & Street, 1998). WA refers to a student's fear, anxiety, and/or avoidance of writing in academic and professional settings (Daly & Miller, 1975; McCroskey, 1977). Daly (1978) reported WA as a major factor in how an individual views writing situations both academically and professionally.

While WA is a barrier, the knowledge of student WA can also be used as a teaching tool. If an instructor has knowledge of their students' WA levels, WA can be diminished by increasing the students' self-efficacy for writing (Martinez, Kock, & Cass, 2011). An individual's level of self-efficacy may be influenced by performance accomplishments, verbal persuasion, emotional arousal, and vicarious experience (Bandura, 1977). Mascle (2013) reported self-reflection helps students believe they have the power and capability to be a writer. Self-reflection activities provide a deeper interpretation of material, increase critical thinking, and allow students to learn how writing can be used in future careers (Hatcher & Bringle, 1997). Finding innovative means to improve writing skills in students is imperative to bridge the gap between classrooms and employers (Irlbeck & Akers, 2009). To help improve the writing instruction provided to students, instructors of a sophomore-level technical writing course at Texas Tech University used the writing apprehension test to better understand why students were apprehensive about writing. Further, self-reflection was used to address how classroom techniques impacted student WA.

How it works

In the first week of class, a pre-test consisting of 26 Likert-type questions was administered to students to identify their WA score (Daly, 1978). Daly and Miller's (1975) WA test is an established and tested measure that places an individual's writing score on a continuum between 26 and 135. The students indicated their level of agreement or disagreement with 26 Likert-type statements (1 = *strongly disagree* and 5 = *strongly agree*) regarding their attitudes, avoidance, and feelings about writing (Daly & Miller, 1975). Student scores were calculated via SPSS® Statistics version 22.0 and were given to students to review during a lecture discussing the meaning of WA scores. The higher the WA score, the more apprehension a student has toward writing. Students were then asked to write a short paragraph about their WA score and what this score meant to them as an introductory assignment for the course.

Additionally, self-reflection was used throughout the semester to help the students critically think about their writing assignments. Students reflected upon classroom techniques, writing projects, and changes in WA. After each writing assignment was returned, students were asked to complete a self-reflection regarding their project by identifying three things they had done well and three things that could be improved upon in their next project. Students were then asked to elaborate on how these aspects could cause people to think negatively and positively about their written communication. Additionally, students were asked to elaborate on how their written communication skills could be improved in their next assignment. Self-reflections also asked students to discuss how different classroom strategies such as feedback, writing assignments, class activities, and self-reflection impact the student's WA

Results to date/ implications

The self-reflections indicated students require encouragement to be comfortable with writing tasks. Students indicated feedback helps them understand writing mistakes and where improvement could be made. One student wrote, "I like constructive feedback because it shows me how I can improve not just where I went wrong." Further, self-reflection helped students realize how they could improve their writing in the classroom to benefit their futures: "The suggestions for revision that [instructor] made were thoughtful, and will influence my future writing. I will put more emphasis on sentence structure as a result of the feedback I received." Overall, students described how the course made them more comfortable with writing. Students expressed positive feedback, self-reflection, and multiple assignments contributed to minimizing their WA. One student explained:

> The assignments in this class have forced me to write, while simply bringing myself to do it seemed like the hardest part. Now I have more of a desire to write, as well as have others review my work. Reflection assignments also help me understand how to notice my improvements and stagnations.

Future Plans/advice to others

In the future, a post-test will be administered at the end of the semester to identify any changes in students' WA scores at the conclusion of the course. Theses scores will be used in future research to quantitatively analyze how WA changed during the course. The use of self-reflection will continue to be used to identify how WA changes throughout the semester. More self-reflection questions should be developed to connect writing in the classroom to real-world applications. Students must become aware of how future employers will perceive their writing ability. Additionally, students should reflect upon how the writing skills taught in the classroom will be transferred to writing in a professional setting.

While self-reflection is beneficial to the student, it can also help the instructor understand the students' needs. Instructors should develop questions to help understand how classroom techniques impact student WA and/or understanding of material. Further questions should be developed to generate information on how to engage the student. An assessment of WA and self-reflection activities should be integrated in all agricultural writing courses.

Costs/ resources needed

No costs are associated with using WA as a learning tool in a writing course. The instrument and scoring guide are available for free online. However, instructors must understand self-reflection is a timely process and should allow adequate time when incorporating self-reflection in the classroom.

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Research Posters

A Comparison of Academic Engagement Indicators between Female and Male Students at the University of [State]

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A Comparison of Academic Engagement Indicators between Female and Male Students at the University of [State]

Introduction/Theoretical Framework

Student academic engagement, one of the best predictors of learning and personal development, is defined as the time and energy that students devote to educationally productive activities (Carini, Kuh & Klein, 2006). Kuh (2003) stated that the premise of engagement is deceptively simple and even self-evident— when students study a subject more, they learn more about it. Chickering and Gamson (1987) identified seven principles of good undergraduate teaching practices: 1) student-faculty interaction is encouraged; 2) collaboration among students during learning is encouraged; 3) active learning strategies are encouraged; 4) prompt feedback is provided; 5) time on task is a priority; 6) high expectations are communicated; and 7) respect is present in diversity of talents and learning methods. The National Survey of Student Engagement uses student engagement data to discover areas where colleges and universities can improve the quality of the student experience (NSSE, 2013b; Chen et al., 2009). This data allows institutions to investigate and act upon results from various subgroups such as gender classification, fields of study, or activities. The purpose of this study was to describe the levels of engagement among students at the University of [State] and to determine if any significant differences ($p < 0.05$) exist between male students and female students.

Methodology

This study used data collected from the 2013 NSSE administration at University of [State]. The population (N = 7,994) included the freshman and seniors enrolled at the university during the 2012-13 school year (freshman = 4,408; seniors = 3,586). Randomly selected samples of freshman and senior students were asked to complete the NSSE assessment during the spring semester. The university's Office of Institutional Research reported response rates for freshman and seniors as 26% and 33%, respectively, compared to average response rates, 17% and 22%, for other institutions.

Students were assessed based on ten engagement indicators, which align with four overall themes. Academic challenge, the first theme, included higher-order learning, reflective and integrative learning, learning strategies, and quantitative reasoning as engagement indicators. Collaborative learning and discussions with diverse others are the indicators associated with the second theme, learning with peers. Engagement indicators associated with experiences with faculty, the third theme, included student-faculty interaction and effective teaching practices. Quality of interactions and supportive environment were the engagement indicators of the final theme, campus environment. In order to make comparisons between groups of students within intuitions, engagement indicator scores are assigned to each student based on a 60-point scale (NSSE, 2013a). The objective of this study was to determine if any significant differences existed between males and females based on their levels of engagement as indicated by the NSSE assessment.

Results

A majority of respondents were senior females (n = 543), followed by freshman females (n = 525), senior males (n = 479), and freshman males (n = 382). At the freshman level, females received significantly higher scores than males for two engagement indicators, with males scoring higher than females in one category. Females (M = 39.56) made significantly higher scores (p = 0.0134) than males (M = 37.19) in learning strategies. NSSE (2013c) found that, on a national average, females (M = 41.8) scored higher than males (M = 38.1) in learning strategies as well. For supportive environment, females (M = 38.55) received significantly higher scores (p = 0.0055) than males (M = 36.21). Nationally, female respondents' (M = 38.0) average scores were also higher than male average scores (M = 36.1) for the same category. The university's male freshman (M = 33.02) scored significantly higher than females (M = 25.82) in quantitative reasoning. Similarly, male freshman (M = 29.8) across the nation received higher scores than females (M = 25.3). For the seven remaining engagement indicators, there were no other significant differences found between freshman males and females.

At the senior level, males received significantly higher scores in two categories with females scoring higher than males in one category. Quantitative reasoning was the first category that senior males (M = 34.07) scored significantly higher ($p < .0001$) than their female counter parts (M = 26.51). Again, the national averages for male seniors (M = 32.5) in quantitative reasoning were higher than female seniors (M = 27.5). The second category that senior males (M = 35.92) received significantly higher scores (p = 0.0163) than females (M = 33.78) was collaborative learning. The national averages for this category showed a much smaller gap between the two groups with male seniors' scores (M = 32.0) exceeding females' (M = 31.5) by half a point. The final engagement indicator that showed a significant difference (p = 0.0066) was learning strategies, for which females (M = 40.46) received higher scores than males (M = 37.96). Senior females in the U.S. scored higher (M = 42.3) than males (M = 38.7) for the same engagement indicator. Respondents showed no other significant differences between males and females.

Conclusions/Implications/Recommendations

The intention of NSSE was for institutions to be able to identify opportunities to improve the quality of student experiences through assessment of engagement indicators. For a majority of the engagement indicators there were no significant differences found between males and females at the university. However, the results from this study did show that female students' scores were consistently higher than male students' in one engagement indicator—learning strategies. Similarly, males consistently received higher scores than females in quantitative reasoning. Both findings were consistent with national averages which reflected similar findings. This suggests that educators should be encouraged to develop opportunities for male students to improve in the area of learning strategies, and for female student to improve in quantitative reasoning. As indicated by Chickering and Gamson (1987), it is important that educators respect students in diversity of talents and learning methods along with providing opportunity for challenge, and active learning strategies.

The results showed that females at the freshman level were more likely to indicate a supportive campus environment, however, at the senior level this was no longer the case. Further institutional research should be done to determine what happens between freshman and senior year. Additionally, further research should be done to investigate the change in collaborative learning between freshman and senior year males. Senior males were more likely to indicate that they collaborated with others to master difficult material. While this result may be due to time and relationships that have been developed throughout the educational experience, this process should be encouraged among all students at the university.

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A Demographical Analysis of Diversity/Multicultural Training Among High School Agricultural Education Teachers Across Six States

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A Demographical Analysis of Diversity/Multicultural Training Among High School Agricultural Education Teachers Across Six States

Introduction

As the U.S. population continues to shift towards a diverse society, agricultural educators are continuing to see that change in the makeup of their students. From 1989 to 2009, the percentage of White students in public schools decreased from 68% to 55% and is predicted to decrease to 50% by 2019 (United States Department of Education, 2011a; United States Department of Education, 2011b). With a growing representation of Latino youth and stable representation of African American, Asian American, and multiethnic youth, agricultural educators must be prepared in terms of philosophy, pedagogy and curriculum to deal with the challenges of an increasingly diverse population while actively preparing this population to navigate the waters of agricultural education successfully (LaVergne, Jones, Larke, & Elbert, 2012). In order for agricultural education teachers to be prepared, one suggestion is an increase in diversity/multicultural training (LaVergne, Jones, Larke, & Elbert, 2012). This study sought to describe the selected demographical characteristics regarding diversity/multicultural training of secondary agricultural education teachers across six states.

Conceptual Framework

The conceptual framework that guided this research was based upon LaVergne's (2008) Diversity Inclusive program model. LaVergne postulates that diversity inclusion is an educational philosophy that welcomes all learners by engaging them in educational programs regardless of their race, ethnicity, or exceptionality. A diversity inclusive program is where the critical infusion of multicultural education, inclusion, and culturally responsive teaching takes place. Teachers and programs that are diversity inclusive have positive perceptions about (a) the benefits of diversity inclusion; (b) understanding that, because of past perceptions, pre-existing barriers may be reasons why students of color and students with disabilities are underrepresented, and (c) having an awareness of possible solutions to increase underrepresented group participation. The model is based upon the philosophical foundations of Salend's (2008) principles of inclusion, Bank's (2008) dimensions of multicultural education, and Gay's (2000) culturally responsive teaching theory.

Methodology

This study utilized descriptive explanatory research. Survey research methods were implemented to gather information to describe high school agricultural education teachers' perceptions regarding classroom diversity and inclusion. The population examined in this study was high school agricultural education teachers in [States] during the 2011-2012 school year (*N* = 1441). The sampling frames used were the 2011-2012 agricultural teacher directories as provided by each state's agricultural education supervisor. This list is updated annually and serves as the most exhaustive list of agricultural educators for each state.

The questionnaire was developed by the researchers with some questions being modeled after the LaVergne (2008) study on Texas agricultural education teachers regarding diversity inclusion in high school agricultural education programs. Survey implementation and data collection methods followed Dillman's (2009) *Tailored Designed Method*. A panel of experts with expertise in diversity and inclusion established content and face validity. Non-response error was addresses by comparing early respondents to late respondents on key demographic variables. No statistically significant differences were found between the two groups. Four hundred and thirty three agricultural teachers responded for a 30% response rate.

Findings

Approximately 59% of the respondents were male while 41% were female. Over 96% of the respondents indicated that they were White/European-American. Fifty-eight percent of the respondents had a Master's degree while 37% of the respondents had a Bachelor's degree. The highest percentage of participants (33%) was between 26-35 years of age. Thirty percent of the respondents had more than 20 years of teaching experience.

Only 39% of the participants had a diversity/multicultural education *course* during their undergraduate matriculation. In regards to diversity/multicultural education *training* (i.e., workshop, guest speaker, cultural immersion experience, etc.), only 33% of respondents indicated participating in such an event. In respect to diversity/multicultural training at the professional level, only 38% of respondents indicated receiving some form of training. The mean for diversity/multicultural education courses taken was 2.25 (SD = 2.42) while the mean for the number of diversity/multicultural trainings was 2.30 (SD = 3.34). Finally, a mean of 3.61 (SD = 4.88) was reported for the number of diversity/multicultural education trainings attended as part of participant's in-service professional development.

Conclusions/Implications

In general, diverse demographical characteristics exist between high school agricultural education teachers among the six states. The male to female ratio of participants (3:2) was greater than previous studies concerning gender makeup of agricultural education teachers across the country (Kantrovich, 2010). Sixty percent of the participants did not have any diversity/multicultural education training in their undergraduate matriculation. Based on the finding in this study, the researchers suggest a continuous increase in the exposure of undergraduate students to diversity/multicultural experiences. Increased training at the pre-service level would "ensure that agricultural educators are prepared to deal with the challenges of a diverse student population" (LaVergne, Larke, Jones, & Elbert, 2009, p.70). As previously mentioned, data of demographic trends denote that this type of training is warranted. If agricultural educators are to stay abreast of the demographic shift occurring in public schools, diversity/ multicultural education courses must be a vital part of the undergraduate curriculum.

Respondents in this survey were likely to have received more diversity/multicultural training in their professional occupations. One implication from this finding is that secondary schools have a vested interested in preparing agricultural educators for a changing population. Based on the implication, teacher preparation programs should collaborate with school administrators to examine possible partnerships regarding greater opportunities for pre-service diversity/multicultural education training.

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Agricultural Knowledge and Perceptions among Students Enrolled in Agriscience Programs in Texas Counties Bordering Mexico

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Agricultural Knowledge and Perceptions among Students Enrolled in Agriscience Programs in Texas Counties Bordering Mexico

Introduction

The cultural and ethnic landscape in the U.S. is rapidly changing; forecasts suggest that by the year 2030 one-quarter of the country's population will be Hispanic, whereas over half of the population in Texas is predicted to be Hispanic (National Research Council, 2006; Petersen & Assanie, 2005). As a result, demographics in public schools in the United States will change, thus requiring agricultural educators to focus on recruiting and engaging a more diverse group of students (Doerfert, 2011). Many secondary agriculture programs have already seen increased participation by Hispanic students; however, in comparison to the demographics of statewide secondary school enrollment Hispanic students continue to be underrepresented in agricultural education (Roberts, et al., 2006). Perhaps limited enrollment of Hispanics in agriculture has been a function of low agricultural literacy and perceptions of agriculture. Studies have shown minority students possess lower agricultural knowledge and more negative perceptions about agriculture (Bechtold & Hoover, 1997; Talbert & Larke Jr., 1995; Wiley, Bowen, Bowen, & Heinsohn, 1997), however, these studies are dated and it is plausible that newer generations of minority students might have different knowledge and perceptions of agriculture. Therefore, an investigation into the agricultural knowledge and perceptions of Hispanic agricultural students is warranted, and the purpose of this descriptive, correlational study was to determine the agricultural knowledge and perceptions of Hispanic and non-Hispanic students enrolled in secondary agriculture programs in Texas counties bordering Mexico.

Theoretical Framework

The theoretical framework that guided this study was information processing theory (Schunk, 2004). More specifically, this study was influenced by the portion of information processing theory that deals with individuals' perception. Schunk (2004, p. 152) stated that "Perception depends on objective characteristics and prior experiences. . . . [and] is affected by people's expectations." In the context of this study, all participants have prior experience with agriculture through enrollment in secondary agriculture courses. However, each individual possesses a variety of background experiences that can lead to varying degrees of knowledge acquisition about agriculture and the development of perceptions about agriculture. Theoretically one would expect an individual with greater knowledge about a subject to have further developed their perceptions toward that subject.

Methodology

The population for this study was students enrolled in 35 agriscience programs in counties bordering Mexico. The sample for this study was drawn using multistage cluster sampling (McMillan & Schumacher, 2010). Agriculture programs were first clustered by the number of teachers and a random sample of 20 students was selected from each school. One limitation of the study was the random sampling was conducted by teachers in the agriculture programs. The Agricultural Awareness Survey (Frick, Birkenholz, Gardner, & Machtmes, 1995) was utilized for this study. Packages containing survey instruments and consent forms were delivered to teachers at their area career development event. Eight schools returned completed survey packets yielding a total of 135 usable responses.

Results

Objective one was to assess the level of agricultural knowledge and perceptions of agriculture among Hispanic and non-Hispanic students enrolled in agriculture programs in counties bordering Mexico. The summated mean for students' overall agricultural knowledge was 18.78

out of a possible 35.00 (*SD*=5.66), rendering a 53.6% correct answer rate. The summated mean for students' perceptions of agriculture was 109.50 out of a possible 175.00 (*SD*=12.84). For overall agricultural knowledge, Hispanics had a summated mean of 18.50 (*SD*=5.81), while non-Hispanics' summated mean was 20.47 (*SD*=4.70). The summated means for perceptions of agriculture were 109.11 (13.04) and 112.00 (10.33) for Hispanics and non-Hispanics, respectively. Objective two was to examine the relationships between demographic variables and perceptions of agriculture and agricultural knowledge. Negligible relationships were found among demographic variables and knowledge and perception variables. The strongest positive associations were between number of agriculture courses taken and overall agricultural knowledge (*r*=.31), general agricultural knowledge (*r*=.23), agricultural public policy knowledge (*r*=.29), environmental and natural resources knowledge (*r*=.30), and perceptions of agriculture (*r*=.22). A negligible relationship was found between the number of agriculture courses taken and agricultural career knowledge (*r*=.07); agricultural career knowledge summated means were the lowest of all knowledge areas. Agricultural perception scores were moderately positively associated with overall agricultural knowledge (*r*=.31).

Discussion/Recommendations

Because of the limitations of the study, the conclusions and recommendations should only be generalized to the participants. The findings showed that participants in this study were predominantly Hispanic, female, FFA members, living in urban areas. This is positive considering prior research has suggested that involvement in agriculture has been mainly limited to male Caucasian students. One disconcerting finding was students answered only about half of the agricultural knowledge questions correctly and they possessed neutral perceptions of agriculture. These findings were comparable to previous studies that used the same instrument indicating more work might be needed to increase all students' agricultural literacy. Additionally, participants exhibited particularly poor agricultural career knowledge, which is alarming as standards pertaining to career planning are included in every agriculture course in Texas. As a result, secondary instructors should place a stronger emphasis on agricultural knowledge development, particularly agricultural career knowledge. A descriptive comparison of Hispanic versus non-Hispanic students showed little difference in agricultural knowledge or perceptions. While little difference existed, Hispanic students possessed slightly lower means in their perceptions of agriculture and all areas of agricultural knowledge with the exception of agricultural career knowledge. This encouraging finding differed from previous studies. While agricultural knowledge and perceptions appear to not have increased from previous studies among non-minorities, perhaps minority students' knowledge and perceptions have increased over time. Further research studies might attempt to better understand the agricultural knowledge and perceptions of minority students in Texas, as well as other areas. Not surprisingly, findings showed that the more agriculture courses a student had taken, the higher their agricultural knowledge and perception. What is more, better perceptions of agriculture were associated with higher knowledge scores. This would seem to substantiate the theoretical idea that individuals' perceptions are based upon their prior knowledge and experiences.

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An Exploration of Perceptions and Attitudes of Senegalese Professors Toward Learner-Centered Instructional Strategies in Agriculture Courses

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Introduction

Recent developments in Senegal show major constraints in institutions of higher education that leave graduates without some key skills needed in the agriculture sector (Guilbaud, Abaye, Gueye, & Li, 2012). According to assessments conducted by the U.S. Agency of International Development (USAID), some of the major constraints in agricultural education are poor curriculum due to insufficient teaching and learning methods (Guilbaud et al., 2012) that often lead to passive learners. Like many African nations, teacher-centered methods characterized by lecture-driven courses and information memorization, have dominated classroom instruction in Senegal (Brown, 2003; Grunert, 1997). In 2011, as part of this increasing involvement in Senegal, USAID launched the Education and Research in Agriculture (ERA) project to strengthen the education, research, and training in Senegal (USAID, 2011). Partnering with Virginia Tech and four other US universities, ERA moved forward with its goal to create a more skilled workforce in the agriculture sector by increasing human resource capacity, improving the access to agriculture knowledge, and advocating for agriculture sustainability through the use of sound practices (Bravo-Ureta, Maas, Diouf, & Ndoye, 2012). The purpose of this study was to assess the needs for employing learner-centered practices and challenges professors' face in terms of current teaching and learning methods at Cheikh Anta Diop University of Dakar (UCAD), Assane Seck University of Ziguinchor, Gaston Berger University of Saint Louis (UGB), Ecole National Supérieure de l’Agriculture (ENSA), and Institut Supérieure de la Formation Agricole et Rural (ISFAR).

Conceptual Framework

The theoretical framework guiding this study was Icek Ajzen (1991) Theory of Planned Behavior. Ajzen’s (1991) theory measures an individuals’ intentions for engaging in or performing a certain behavior by looking at three components: attitude toward the specific behavior, social environment surrounding the individual (subjective norm), and the individual’s perceived confidence and ability to perform the behavior (perceived behavioral control) (Patterson, 2009). The Theory of Planned Behavior was used to understand professors’ attitudes, subjective norms, and perceived behavioral control to determine why professors engaged in teacher-centered rather than learner-centered practices.

Methods

A survey research design was used for this study to ask professors questions on their beliefs, attitudes, and behaviors (Ary, 2014). The goal of the survey was to collect data on professors' teaching strategies, their attitudes toward learner-centered methods, social climate at the institutions, and to understand their perceived confidence in effectively incorporating these methods in the classroom. Participants were selected using a comprehensive sampling technique due to the small population of agriculture professors who had relevant information and insight on teaching strategies and pedagogical techniques (Ary, 2014). To participate in the survey, a professor had to be currently teaching or taught an agriculture related course in the past. The primary data collection tool was collected using a 4-part survey questionnaire that included rankings, 5-pt Likert type scales, and close-ended questions. Data was analyzed using a frequency analysis. The results were summarized and key findings reported in this abstract.

Findings

Thirty-five male and five female professors participated in the study with an average teaching experience of 18 years. Exactly half of the participants (n = 20) from ENSA and ISFAR received training from ERA on syllabi and learner-centered approaches. The majority reported having positive attitudes towards the new methods (n = 35) and stated that incorporating them in classrooms would be good (n = 37). Ninety-five percent of the professors (n = 38) stated that they used Lecture/PowerPoint presentations as the main teaching tool in their courses. All 20 of the professors at the institutions that received training reported using visual aids and 19 used hands-on activities as teaching tools. Similarly, a majority of the professors without training reported using visual aids (n = 17) and hands-on activities (n = 18).

The survey asked participants what teaching tools they felt were the most effective and 47% of the respondents (n = 19) felt that lectures and PowerPoint presentations were the most effective. Another 37% of respondents (n = 15) felt that group problem solving and discussions were the most effective. When asked about changing from teacher-centered to learner-centered methods, 85% of the participants stated they would make a marked shift given the proper resources and training (n = 34). The professors reported that primary constraints in incorporating learner-centered approaches were the lack of equipment and materials to facilitate learning, electricity outages and poor internet connections, course structure and schedules, class sizes, and the a lack of training. Additionally, the professors reported little to no pressure from administration or peers about their teaching strategies. However, approximately half of the professors (n = 18) admitted that their administration rarely discussed innovative teaching techniques and that there were few available resources for developing learner-centered teaching (n = 20). Finally, only half felt confident they could use learner-centered strategies properly.

Conclusions and Recommendations

The findings of the study identified key constraints preventing professors from adapting learner-centered teaching into their classrooms including training, infrastructure, and class sizes. Additionally, there were discrepancies between the pedagogical techniques currently being employed versus techniques thought to be the most effective. Professors that had some training in learner-centered methods agreed that there were numerous approaches to teaching, yet nearly all still used traditional methods in their classrooms. Therefore, it is recommended that further qualitative research be conducted to fully identify where the gaps between theory and practice are occurring and assess if learner-centered methods are being employed appropriately.

This study also supports Ajzen's (1991) theoretical framework in showing how an individual's intentions to perform a certain behavior are influenced by their attitude toward a behavior, the social norms, and perceived confidence in engaging in a behavior. The participating professors indicated positive attitudes towards engaging in learner-centered methods and felt little to no social pressure in engaging in other teaching techniques. However, professors reported that their institutions provided few, if any, resources for using learner-centered teaching and over half felt that their institutions' approval of their teaching strategy was important. These findings indicate that: 1) understanding the cultural context of Senegalese teaching and education is fundamental to addressing the normative beliefs and subjective norms contrary to the use of student-centered learning and 2) partnerships with international institutions can play a key role in increasing self-efficacy, which will have an impact on actual behavioral control toward more leaner-centered approaches.

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Research Poster Abstract

Bringing Balance to the Force: Insights Into Why Males Enter the Field of Teaching Agriculture

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Bringing Balance to the Force:
Insights Into Why Males Enter the Field of Teaching Agriculture

Introduction

Supplying quality teachers in the agricultural education profession is a constant struggle. This research directly aligns with Priority 5 - Efficient and Effective Agricultural Education Programs of the AAAE National Research Agenda (Doerfert, 2011) by providing for the developmental needs of diverse learners in all settings and at all levels. This academic year in [State], the percentage of our teacher candidates (N=52) who are female is at 88 percent and early career (years 1 to 3) teachers [N= 108] are at 75 percent ([person], personal communication. February 18, 2015).

Today, we see a shift in the gender equity of the agricultural education profession. Males have traditionally dominated the agricultural education profession (Whittington & Raven, 1995, p. 12). In 1995, researchers (Whittington & Raven) documented a marked increase in the number of female teachers entering the profession. Gender inequity in the classroom is not just a problem for agricultural education. Johnson (2008) shared approximately 28 percent of all classroom teachers in [State] were male, while nationally males comprised 25 percent of the teaching population at the secondary level.

Theoretical Framework

The need for more male teachers is important as male students struggle to find strong male role models, especially at a young age (Johnson, 2008). Johnson (p. 2) further stated, "...stable academic role models for disaffected boys...counter negative attitudes towards schooling, which lead to higher dropout rates and poor achievement." Identifying the reasons why males are becoming agricultural teachers will help clarify how to resolve the imbalance in the number of males entering the profession. This research is grounded in Social Cognitive Career Theory (Lent, Brown & Hackett, 1994, 2000, 2002) which indicates an individual's personal input (gender) has bearing on career objectives and perceived aspects of the environment influence beliefs, intentions, and actions. Environmental factors can affect efficacy and career interests.

Methodology

The theoretical perspective of this qualitative study was rooted in phenomenology, and its methodology in phenomenological research. These selections ensured existing understandings of males entering the agriculture teaching profession were cast off, permitting the creation of new understandings and meanings (Crotty, 2003). Reliability was established through the standards of rigor (Ary, Jacobs, Razavieh, & Sorenson, 2006). The study's credibility was secured through the use of peer reviews and member checks. In this study, rich descriptions from the participants support potential transferability of findings. Use of the coding and re-coding process further established dependability. Confirmability is evidenced by the lack of researcher bias. The use of subjectivity statements provided the first line of defense, followed by the use of an expert panel, member checks and an audit trail. Qualitative studies rely on purposive or criterion-based sampling for the insight it brings to the study (Ary et al., 2006). We interviewed all twelve

[State] male teacher candidates following their 2012-2013 student teaching/intern experience. They were asked "What drew you into teaching agriculture?"

Findings

Two themes emerged as to why males chose to enter the agriculture teaching profession:

Theme 1: Inspiration from a Mentor

- "I just had a really influential Ag teacher."
- "I respected the men they were, I really enjoyed doing a lot of FFA stuff…the more I was exposed to places and other great agriculture teachers it kind of just kept…my sophomore year of high school I decided I wanted to be an agriculture teacher."
- "I had a positive formative experience just seeing the amount of dedication my agriculture teachers put in, I wanted to be like that."

Theme 2: The Desire to Equip Students for their Future

- "I like working with kids…more specifically working in the industry…it appeared like they didn't know how to work."
- "I saw an opportunity to develop good work ethic here in the classroom."
- "I decided I want to give that kind of dedication back…we find so many kids that are disadvantaged that are being put into our agriculture programs…I felt it this was a time where we can make a difference."
- "I am a firm believer not every kid is going to go to college… you're teaching each of them life skills…It is something they can live on to support themselves."

Conclusions

The participants felt they had strong male mentors that inspired them to help others. The majority identified their mentors as great teachers who were highly dedicated and influential. The participants also viewed high school students as very important and felt they could make a difference in their futures, setting them on the right path. This included developing career readiness, soft skills, and work ethic to equip students for entry level industry positions.

Implications/Recommendations/Impact on Profession

Male agriculture students need male agricultural teachers to serve as mentors, promoting teaching agriculture as a viable career choice. This mentoring needs to be intentional, modeling positive behavior and explicitly sharing how they have impacted others through their efforts. This feeds into the second identified theme of how individuals seek to help others.

[State] has seen a shortage in agricultural teachers and is forecasted to experience a 20 teacher deficit annually into the foreseeable future. As we focus on reducing the shortage it is important to consider how we can also close the gender gap among agricultural teachers. By identifying why males choose to enter the field, we are better poised to create balance in the force.

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Cooperation Based AET Instructor Professional Development in Nigeria

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Cooperation Based AET Instructor Professional Development in Nigeria

Introduction

Implementing high quality professional development for postsecondary Agricultural Education and Training (AET) instructors is a critical step in facilitating inclusive economic capacity building in developing countries. Most technical agricultural graduate programs in developing nations do not include training in instructional methods, creating lesson plans, or assessment techniques and lecturers are usually forced into learning the craft of teaching through trial and error. Unfortunately, poor teaching and a lack of innovative strategies do little to break the status quo view that agriculture is a distasteful option for youths. It is likely that economic progress will be attenuated in developing nations if AET institutions cannot attract and motivate capable students to engage in addressing the critical problems surrounding food security, sustainability, and climate change. The purpose of this descriptive study was to create information about the employment of cooperative learning processes to support AET instructor professional development in Nigeria. The findings reveal that participants believed that by cooperating together they were able to: a) learn an exceptional amount; b) create more outputs; and c) achieve higher quality outputs and outcomes.

Theoretical Framework

Social interdependence is one of the most fundamental and ubiquitous aspects of being a human being and it affects all aspects of our lives (Deutsch, 1949, 1962). Social interdependence arises when individuals share common goals and the outcomes each individual experiences are dependent on the actions of others to which they are connected (Deutsch, 1962; D.W. Johnson & Johnson, 1989). Synthesizing the research surrounding social interdependence theory that took place over a thirty year period, Johnson & Johnson (2009), were able to modify and extend social interdependence theory in two distinct ways: a) they were able to identify and validate variables that mediate the effectiveness of cooperation; and b) by investigating numerous independent variables they were able to expand the scope of the theory. Based upon their research investigating the implementation of cooperation, Johnson and Johnson (2009) have posited that five variables mediate the effectiveness of cooperation and cooperative learning: a) positive interdependence; b) individual accountability; c) promotive interaction; d) appropriate use of social skills; and e) group processing.

The purpose of this descriptive study was to create information about the employment of cooperative learning as both a content and process component of AET instructor professional development in Nigeria. Within the scope of this study, cooperative learning was operationally defined as collaborative efforts which included all five mediating variables. The objectives of the study were to assess the AET instructors' perceptions of: a) their institute cooperative learning experiences; b) their institute cooperative learning experience outputs and outcomes; and c) simultaneously learning about and participating in cooperative learning. It is also hoped that this study will begin to more clearly define best practices associated with implementing cooperative learning a wider array of cultural contexts.

Methods / Procedures

The target population for this study consisted of AET instructors in Nigeria that had participated in one of ten three week long train the trainer model professional development institutes (N=252). The focus of the institutes was to develop the capacity of the participants to construct

and deliver high quality instruction which raises the achievement level of AET students. The institute included instruction regarding the theoretical underpinnings, effective strategies, and example activities related to cooperative learning. Instruction was focused on assisting participants to experience cooperative learning while they learned about it.
Participant outputs included group processing reflections, individual accountability reports, and concept maps which depicted pathways to cooperative goal achievement.

The participant frame for the study was obtained by using a listing of all AET instructor participants provided by the University of Nigeria at Nsukka, the lead institution on the project. Usable responses were obtained from 214 respondents for an overall response rate of 85%.
The researcher developed survey instrument used to collect data for the study consisted of 36 items in three separate subscales. Subscale 1 of the instrument measured participant perceptions of cooperative learning experiences. Subscale 2 created information regarding participants' perceptions of how their cooperative learning experiences impacted their outputs and outcomes. Subscale 3 measured participant perceptions regarding their learning about and participating in cooperative learning groups simultaneously. Expert AET reviewers from Nigeria were consulted to affirm the content and face validity of the survey instrument. English is the official language of Nigeria and is the medium for instruction at Nigerian educational institutions. Based on the data collected the internal consistency of the survey instrument was estimated to be as follows: entire instrument = .79; subscale 1 = .82; subscale 2 = .80; and subscale 3 = .76.

Results

The 214 participants in this study had a mean age of 44 years (standard deviation = 6.6). 12% of the participants were female, 32% were at the level of professor, and 68% had a Master's degree as their highest degree completed. A slight majority (53%) of the 64 participants who had attained a doctoral degree, received their highest degree from a U.S. or European institution.
The AET instructors strongly agreed that their experiences with cooperative learning facilitated engagement, learning, and the creation of high quality outputs. This echoes research that demonstrates that cooperative learning promotes greater levels of productivity than individualistic scenarios (Kuchenbradt, Eyssel, & Seidel, 2013).The participants perceived that their cooperative learning experiences led to the improvement of both their instruction and collegial engagement. This finding is supported by research that indicates cooperative learning experiences help cooperators to distill more frequent insights into higher level cognitive challenges, such as teaching, than other methods of instruction (Johnson & Johnson, 2005). The AET instructors believed that by intertwining content instruction about cooperative learning with actual cooperative learning experiences they were able to develop a deeper level of knowledge and transfer their understandings to other contexts.

Conclusions / Recommendations

How instructional and professional development planners design learner interactions is a consequential determinant of: how much is learned; learner motivation; and learner productivity. Overall, the findings indicated that the AET instructors perceived cooperative learning to be a robust and beneficial framework for planning and directing instruction. That finding is well supported by the existing body of literature from research carried out in various cultures and is rooted in strong connections between theory, research, and practice. It is recommend that future research utilize quasi experimental or experimental methods to determine whether cooperative learning experiences improve AET instructor output productivity. Additional research should be carried out to compare groups that utilize contextualized cooperative learning experiences and groups that use other methods for enacting professional development instruction.

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Creating International Awareness and Global Competence among Undergraduate Students: Using International Students as *Authentic Learning Resources*

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Creating International Awareness and Global Competence among Undergraduate Students: Using International Students as *Authentic Learning Resources*

Introduction/Conceptual Framework/Need for the Research

Globally competent individuals are knowledgeable, hold positive attitudes toward others, linguistically competent in other languages, and appreciate the value of other cultures (Hunter, 2004). Sham and George (2006) stated that responsible people, who endeavored to positively impact the world, and the future, were globally competent. Hunter (2004) concluded global competence is required for effective interaction and functioning in a cultural environment different from a person's own; therefore, the individual not only needs an open mind, but also to invest effort in seeking to understand the practices and expectations of other cultures.

According to Grudzinski-Hall (2007) and Hunter (2004), to be aware is to know oneself and be tolerant of other cultures in professional and personal contexts. Reimer (2009) was skeptical about the success of universities in their efforts to help students in understanding global challenges. The breadth and nature of global competence and international awareness as concepts makes their teaching a difficult task because one 16-week semester is insufficient time for making an individual *globally competent.* However, strategies exist for creating international awareness and *beginning the journey to global competence.* A resource frequently overlooked or underutilized may be the international graduate students on a university's campus.

At [. . . University], *International Programs in Agricultural Education and Extension* (*AGED 4713*) is one of three international dimension courses aiming to raise students' awareness on global issues mainly in the context of agriculture. Based on the course's fall 2013 syllabus, the students were assigned to conduct structured interviews of international graduate students from developing countries and provide a written report of their interviews. The students were required to ask questions about and explore the students' countries, including demographics, geography, history, culture, economy, agriculture, and challenges. When they submitted a written report of their interactions, the interviewees confirmed the content of the reports through electronic mail.

Methodology

We investigated the perceived and expressed *gain* or *changes* in the international awareness of students enrolled in AGED 4713 during the fall semester of 2013. The interviews of international graduate students served as the *treatment* in this investigation. The data used were not sourced through the interviews but rather were the students' perceptions, as expressed in their written reports for a class assignment.

According to Baker (2006), one of the most important types of data in observational studies is field notes. In our case, the students' written reports were a form of field notes. Their *cross-cultural interaction reports* were received for critique and grading. A content analysis of those reports was conducted for this study. Conventional content analysis, a method for analyzing textual data, was used. This research method emphasizes the meaning, content, and context of the data; such meaning may be direct or implicit (Hsieh & Shannon, 2005). By iteratively reading the 12 student reports, an understanding of their perceptions was developed through subjective interpretation. During the content analysis, iterative readings of the reports helped to narrow the inquiry to what were considered key statements from the students' reports. These were statements expressing surprise, emotion, or the essence of the cross-cultural encounters students had, and what they learned that was profound and likely to impact them over time. The significant statements were grouped into four main thematic areas: perceived cultural similarities and differences; gains in international knowledge and awareness; perceived utility of the cross-cultural interactions in general; and, reflections from the cross-cultural encounters. Wolcott's (1994) template (as cited in Creswell, 2007) was used for description and interpretation. It involved reading and highlighting significant information, looking for text patterns, and interpreting the text through specific variables of interest. As a result, a composite description of the content analysis emerged.

Findings

The findings of this study were derived from the *cross-cultural interaction reports* of 12 AGED 4713 students during the fall semester of 2013. The students interviewed eight different international students. Four themes arose from the content analysis of the students' reports.
Theme1: Perceived Cultural Similarities and Differences: Several students identified similarities with the interviewees such as religion, hobbies, musical interests, and academic disciplines.
Theme 2: Gains in International Knowledge and Awareness: Students reported they had gained wide knowledge on international issues and much more about specific countries as a result of the cross-cultural interactions with the international graduate students.
Theme 3: Perceived Utility of the Cross-Cultural Interactions: Students constructed individual meanings from the interactions. They also found that the cross-cultural interactions made them more tolerant by gaining knowledge and understanding about the struggles and challenges of other cultures, people, and countries.
Theme 4: Reflections from the Cross-Cultural Encounters: The interview encounters led some of the students to express their desire to visit the country they discussed or a similar country in the same region of the world.

Implications/Recommendations/Impact on the Profession

The approach in which international students were used as sources to amplify issues about a country's history, culture, economy, agriculture, and development challenges was a viable way of increasing students' international awareness and global competence. The students' reports indicated awareness of prevailing conditions in selected countries. Through the interviews, they were seeking to understand the practices of other cultures, and the students became more flexible in their attitudes and shed some assumptions about people who were different from themselves. We recommend other universities that offer international dimension courses try this learning approach.

Because of internationalization and globalization trends, instructors need innovative ways of teaching that enable students to acquire the knowledge, skills, and attitudes needed to function effectively in an interconnected and globalized world (Moriba, 2011). This is an approach to instruction in which a university's international students are recognized as *authentic learning resources* for enhancing the experiences of U.S. undergraduate students in regard to acquiring international awareness and augmenting their journey to achieving global competence.

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Research Poster

Determining Teachers' Agricultural Safety & Health Level of Instructional Practices

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Determining Teachers' Agricultural Safety & Health Level of Instructional Practices

Introduction/Need for Research

The agriculture industry is one of our nation's "most hazardous industries" as farmers are at a "very high risk for fatal and nonfatal injuries" (Center for Disease Control [CDC], 2014). Of the estimated 1.853 million full-time workers engaged in production agriculture in 2012, an estimated 731,000 workers were below the age of 20 "performing the farm work" (CDC, 2014).

The CDC (2014) also reported that "on average, 113 youth less than 20 years of age die annually from farm-related injuries…" and 34 percent of these deaths involved youth between 16-19 years of age. During 2012, "an estimated 14,000 youth were injured on farms; 2,700 of these injuries were due to farm work" (CDC, 2014). While looking at the causes of these injuries, 23 percent were attributed to machinery (i.e.: tractors), 19 percent involved motor vehicles (i.e.: ATVs), and 16 percent were the result of drowning (CDC, 2014).

It is unclear how teachers are prepared to train students for safety and health in laboratories and on school farms. Understanding how teachers have been trained to teach safety and health in agriculture, would allow for curriculum development to manage risk and liability within facilities and better prepare students for a safe and healthy work experience in agriculture industry.

Conceptual Framework

Educational learning laboratories across all content areas are urged to develop a stronger 'culture of safety' (National Research Council of the National Academies [NRCNA], 2014). To develop and strengthen a culture of safety, the leader of the entity or facility must be trained to lead the change. Professional development training is considered the most effective way to improve teacher/leader practice (Darling-Hammond & Bransford, 2005; Supovitz & Turner, 2000). This research aims at determining the extent these teachers train their students in personal safety and health issues in agriculture?

Methodology

The methods were presented to the [University] Human Assurances Office and were cleared to proceed. The instrument, adapted from Horne's work (1994) to inventory farm safety practices, was submitted to a panel of three experts who possess years of experience teaching agriculture and managing extensive school farm units. The panel was asked if each item was relevant and applicable at a school farm and if it was relevant and applicable in the agriculture industry. The experts were also asked to suggest additional items within the seven categories and to make edits to clarify each item. Once completed, the researcher edited the instrument and performed a pilot study of secondary agriculture teachers outside of the target population. Twenty two teachers completed the pilot via SurveyMonkey, notifying the researcher of any challenges. All challenges were addressed. The instrument was deemed reliable and accurate.

The target population (N=163) included all of [State's] [blank] Region secondary agriculture teachers provided by the regional supervisor. Dillman's (2006) methods were followed to complete the online survey and resulted in 90 teachers responding (55% response rate) and no further efforts were made to follow up with non-respondents. Results are only applicable to those whom responded.

Results/Findings

The summated means organize the level teachers train their students in each of the seven areas. The mean ranges indicate the low and high level of an item within the safety area (see *Table 1).*

Table 1. To what extent do you train your students in each item? *(N = 90)*

Items	SAFETY AREAS SUMMARIZED	Mean Ranges		Summated Mean	S.D.
20	Overall Ag Safety & Health *(n = 71 to 75)*	2.69	9.76	6.73	3.02
9	Livestock Facilities *(n = 43 to 47)*	2.83	6.81	4.81	3.91
15	Farm Buildings *(n = 63 to 65)*	2.29	8.52	4.72	3.56
11	Chemical Storage *(n = 48 to 50)*	2.12	6.64	4.66	3.89
19	Tractor Safety *(n = 43 to 47)*	2.79	5.64	4.55	4.42
17	Equipment & Machinery *(n = 42 to 45)*	2.26	7.33	4.32	4.01
6	Crop Storage *(n = 56 to 57)*	1.74	2.89	2.42	2.82
97	TOTALS			4.60	3.66

Note: (Scale: 0=none ; 10=Fully)

Conclusions

Teachers indicate they train their students in overall ag safety and health. In the areas of livestock facilities, farm buildings, chemical storage, tractor safety, and equipment & machinery, students were trained much less. Crop storage was by far the lowest level of training, indicating they are not fully training their students in safety and health. Further, there are very low scoring items in all seven safety areas which indicate specific needs for professional development to best serve their students. Because none of the summated means are near the “fully” trained end of the spectrum, no item should be overlooked for professional development opportunities.

Implications/Recommendations/Impact on Profession

Most high school agriculture programs have school farms and expansive facilities that attempt to mirror the agriculture industry. We have the opportunity to train secondary teachers to best prepare all of their students to be safe and healthy employees and business owners/operators across [state] and the west. This research is a part of a larger project to identity holes in training, while utilizing the school facilities and their very capable teachers to strengthen the experience for their students. Perhaps we can develop an agricultural safety and health certification program, similar to others across the nation (Ortega, Tormoehlen, Field, Balschweid, & Machtmes, 2002). Further efforts will be made to ensure the program is effective (Carrabba, Talbert, Field, & Tormoehlen, 2001).

A long range goal is to not only improve safety and health practices on the school farms and laboratories, but to impact the agriculture industry by supplying safe and health conscious employees, owners, and leaders.

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RESEARCH POSTER

Disciplinary Core Ideas in the Agriculture, Food and Natural Resources Career Pathways

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Disciplinary Core Ideas in the Agriculture, Food and Natural Resources Career Pathways

Introduction/Need for Research

Currently, a shortage of scientists for agricultural positions exists throughout the country. Rampant changes in the agriculture industry require a workforce with the ability to solve problems associated with scientific content. The United States Department of Agriculture recommended that students seeking future employment in the agriculture industry have "basic science skills and the ability to solve problems with scientific applications" (CSREES, 2005, p. 12). Science, technology, engineering, and math (STEM) occupations are critical to the continued economic competitiveness of the United States (Carnevale, Smith & Melton, 2011). Guidance on how STEM education – science education in particular – should be designed has been provided by the recent publication of *A Framework for K-12 Science Education* (NRC, 2012). This framework is based on three main dimensions: practices, crosscutting concepts, and disciplinary core ideas. The agricultural education profession needs to develop a curriculum framework emphasizing STEM concepts to prepare a future of agricultural scientists who are highly trained. The project is significant to the national agricultural education research agenda (Doerfert, 2011) that called for enhanced program delivery models and an abundance of highly qualified agricultural educators.

Conceptual Framework

The recent publication *Transforming Agricultural Education for a Changing World* (2009), sponsored by the National Research Council, called for action to meet the need of professional education in agriculture of a diverse student body for the largest food producer in the world, the United States. School-based agricultural education holds significant potential for helping to alleviate the shortage of agricultural scientists. Secondary school agriscience programs exemplify a new biology approach in that integrated sciences are connected to agricultural problems and practices through a formal classroom and laboratory instructional program (NRC, 2009). Agricultural education is in an ideal position to teach scientific content through an agricultural context (Enderlin & Osborne, 1992; NRC, 2009; Thompson, 1998; Washburn & Myers, 2010). This project is a first step in developing a curriculum framework for programs that set high ability students on an agriscience track.

Purpose and Objectives

The purpose of this study was to begin the process of creating a framework for identifying STEM principles in the secondary school agriculture education curriculum. The objective of this study was to identify disciplinary core ideas to be included in a secondary school agriscience program using a panel of experts in agricultural education – classroom teachers, state agricultural education staff, and agriculture teacher educators.

Methodology

This descriptive study, conducted in fall 2013 through spring 2014, employed a survey research design to identify STEM disciplinary core ideas inherent to the eight agriscience career pathways. Three representative groups of expert panelists were purposively selected for this study: school-based agriscience teachers (*n=78)*, state agriculture education staff (*n*=15), and agriculture teacher educators (*n*=24). Three rounds of data were gathered electronically using Qualtrix™. Round 1 had participants suggest a minimum of three STEM disciplinary core ideas for each of the eight agriscience career pathways in the dialogue box provided. After some revision to the initial list or proposed disciplinary core ideas which participants submitted, round 2 had participants indicate their level of agreement that each item from the list actually represented a disciplinary core idea within each career pathway on a five-point Likert-type scale. In this round, participants were also given the option of suggesting any additional core ideas they felt should be added and/or suggest changes to any of the items on the list of each of the eight career pathways. Finally, round 3 had participants indicate their level of agreement that each item from the list actually represented a disciplinary core idea within each career pathway on a five-point Likert-type scale.

Results/Findings

A panel of 117 experts identified a total of 162 disciplinary core ideas of STEM concepts inherent in the Agriculture, Food and Natural Resources career pathways. While the number of disciplinary core ideas per pathway varied from 14 to 24, for the purpose of this abstract, the disciplinary core idea with the highest mean in each is provided in Table 1.

Table 1
Top Disciplinary Core Ideas of STEM *Concepts Inherent in Each of the Eight Agriculture, Food and Natural Resources (AFNR) Career Pathways*

AFNR Career Pathway	Total Items	Highest RatedDisciplinary Core Idea	*M*	*SD*
Agribusiness Systems	19	Records for agricultural business	4.50	0.60
Animal Systems	20	Anatomy and physiology of animals	4.84	0.37
Biotechnology Systems	14	Cell biology	4.73	0.45
Environmental Services Systems	20	Water	4.68	0.47
Food Products and Processing Systems	23	Chemistry of food	4.75	0.44
Natural Resources Systems	24	Air, water, and soil quality	4.77	0.49
Plant Systems	22	Anatomy and physiology of plants	4.77	0.43
Power, Structural and Technical Systems	20	Safety	4.77	0.49

Note. Scale 1= Strongly Disagree to 5 = Strongly Agree

Conclusions/Implications/Recommendations

The panel of 117 experts identified a total of 162 disciplinary core ideas of STEM concepts inherent in the Agriculture, Food and Natural Resources career pathways. The number of disciplinary core ideas per pathway varied from 14 to 24. The structure for agricultural education curriculum development suggested by this research (Practices, Crosscutting Concepts, and Disciplinary Core Ideas) is supported by recent National Research Council (2012) publications. It is prudent that the agricultural education profession utilize structures that have been proven effective, both empirically and in practice, by other related STEM disciplines. Furthermore, utilizing a structure similar to other STEM disciplines will aid in cross-curricular collaborations at the local, state, and national levels. Agricultural educators will have an increased awareness of the practices, cross-cutting concepts, and disciplinary core ideas included in the agriscience program. By providing teachers with education and guidance in highlighting STEM competencies in agriculture, the teachers will be more effective, agriscience programs will be of higher quality, and the components leading to high quality programs will be clarified for use across the nation. As students are exposed to STEM concepts in high quality agriscience programs led by prepared, effective teachers, their interest and engagement in agriculture-related STEM careers will increase. The end result contributes to an abundant supply of an educated workforce in agricultural careers that require scientific knowledge.

Recommendations for future research and practice include:

1. Validate the disciplinary core ideas identified in this abstract with business and industry leaders, science educators, and math educators.

2. Conduct a national needs assessment to determine the current status of how these disciplinary core ideas are currently included in school-based agricultural education instruction.

3. Teacher educators should utilize the results of this study and the eventual framework in designing and teaching curriculum development courses.

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Research Poster

Does the Quantity of Agricultural Mechanics Training Received As Secondary Students Affect Teacher Competence

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Does the Quantity of Agricultural Mechanics Training Received As Secondary Students Affect Teacher Competence?

Introduction

Graduates of agricultural education programs must be equipped with content knowledge necessary to be successful educators (Doerfert, 2011). Agricultural mechanics instruction is an important component of secondary agricultural education programs in the United States and laboratory experiences are an integral component of agricultural mechanics instruction (Bear & Hoerner, 1986). Agricultural mechanics is offered in 59% of agricultural education programs across the nation (National FFA Organization, 2013); therefore, a need exists to assess how teachers are being prepared to teach this important topic (Hubert & Leising, 2000). Predetermined beliefs of teachers often influence how they teach content in both the classroom and laboratory setting (Knobloch, 2008). Pre-service agricultural education teachers' attitudes about agricultural mechanics in secondary agricultural education are likely determinates of the extent to which they pursue courses at the secondary level (Wells, Perry, Anderson, Shultz & Paulsen, 2013). Quality learning experiences in the agricultural mechanics laboratory is important and confidence in teaching agricultural mechanics increases with experience (Burris, McLaughlin, McCulloch, Brashears, & Fraze, 2010). researchers sought to determine if significant relationships existed between agricultural education teachers' quantity of agricultural mechanics training received as secondary students and their current perceived teacher competency in agricultural mechanics.

Theoretical Framework

According to Bandura (1997), self-efficacy is identified as the "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" (pg. 3). Therefore, people who have more consistent, stable behavior based on their previous experiences, believe they possess the required agricultural mechanics competency needed to be successful. Efficacy expectations are presumed to influence an individual's level of performance by enhancing intensity and persistence of effort until reaching self-prescribed standards (Bandura, 1977). Bandura's theory of self-efficacy was used to guide this study and assist in the search to understand the relationship between secondary level agricultural mechanics training and teacher competence. The purpose of this study was to describe the perceptions of secondary agricultural education teachers concerning personal competence to teach selected agricultural mechanics skills and if a relationship exists to the quantity of agricultural mechanics training respondents received at the secondary level.

Methods

This descriptive study used survey research methods to summarize characteristics, attitudes, and opinions to accurately describe a norm (Ary, Jacobs, Razavieh, & Sorensen, 2006). The paper-based instrument contained three sections. Section one included 54 skills related to agricultural mechanics. Skills were separated into five constructs, including: Mechanic Training and Skills, Structures/Construction, Electrification, Power and Machinery, and Soil and Water. Respondents were asked to use a five-point summated rated (Likert-type) scale to rate the perceived personal competency level in teaching each skill. Section two consisted of 15 demographic questions relating to the teacher's educational and teaching background, and section three included nine questions about program and school characteristics. 2

Researchers distributed a questionnaire to each secondary instructor (*N* = 130) in attendance at the state teachers conference and asked that it be completed by the end of the event. Each participant was offered a power tool institute safety curriculum as an incentive for completing and returning the questionnaire. These efforts yielded a sample of 103 usable instruments for a 79.2% response rate. Data were coded and analyzed using PSAW 18.0. The variables within this study (i.e., teacher/program demographics and agricultural mechanics training and skills received at the secondary levels) were quantitative in nature and had distinct levels of measurement. Therefore, Spearman correlations were used in this study to examine potential relationships between the quantity of agricultural mechanics training and skills respondents received at the secondary level and teacher's competence.

Findings

The first objective describes the demographics of the agricultural education instructors in [STATE]. The typical respondent was in a single teacher program in a rural community, and held a Bachelor's degree. A majority of teachers were male (*n*=69, 67%), indicated 15 years or less of teaching experience (n=65, 63.2%), were in one teacher departments (n=91, 90%) in a rural area (n=80, 79.2%). Objective two examined the relationship between the quantity of agricultural mechanics training received at the secondary level and teacher competence. Statistically significant, positive correlations were found in 53 of the 54 skill areas. The only skill with no significant correlation was fencing (r_s=.128). The skills with the strongest correlations in each construct skill area were oxy-acetylene brazing skills (r_s=.646), small engine safety (r_s=.643), wiring skills (switches and outlets) (r_s=.575), legal land descriptions (r_s=.579), and bill of materials (r_s=.525).

Conclusions, Implications and Recommendations

The positive correlational relationships found in this study indicate that experience as a student in secondary agricultural mechanics training can add to teaching competence, which in turn may aid in preparing highly qualified teachers with an increased confidence to teach agricultural mechanics. As Burris et al. (2010) noted, agricultural teachers felt less confident teaching agricultural mechanics than any other curriculum area. The present findings offer another avenue to build confidence in future teachers is to ensure a high quantity of agricultural mechanics courses should be delivered at the secondary level. Teacher education students and programs especially need to be aware of these critical relationships. This positive relationship in the quantity of training received and self-competence is supported by Bandura's (1997) Social Cognitive Theory; previous experiences factor into perceived performance. Self-efficacy and competency expectations are presumed to impact level of performance by influencing persistence to master said agricultural mechanics skills. Furthermore, contemplate the impact teachers' preparation and experience (or lack of) may have on the student experience in the agricultural mechanics classroom and laboratory. The American Association for Agricultural Education's National Research agenda calls for research that is needed which clearly illustrates the factors that influence learning which are critical to advance and graduates of these programs must be equipped with the understanding and tools necessary to be successful educators (Doerfert, 2011). 3

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Does the Quantity of Agricultural Mechanics Training Received At The Secondary Level Impact Teacher Perceived Importance of Agricultural Mechanics Skills?

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Does the Quantity of Agricultural Mechanics Training Received At The Secondary Level Impact Teacher Perceived Importance to Teach Agricultural Mechanics Skills?

Introduction

Secondary agricultural education programs in Iowa have local control affording teachers the ability to develop curriculum based on student and community needs (Iowa Department of Education, 2011). However, teachers are not always adequately prepared or comfortable teaching the agricultural education courses a community perceives as important (Shelley-Tolbert, Conroy, & Dailey, 2000). Wells, Perry, Anderson, Shultz, and Paulsen (2013) reported 54 mechanics skills that agricultural education teachers indicated were appropriate for secondary agricultural mechanics courses. The large number of skills deemed appropriate for agricultural mechanics highlights the broadness of the subject. This range of skills adds to the complexity of choosing what is important, and makes it difficult to be adequately prepared to teach those skills.

Theoretical Framework

The theoretical framework guiding this study is Vygotsky's social development theory. Vygotsky (1978) indicated that "every function in the child's cultural development appears twice; first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological)" (p. 57). The agricultural mechanics skills received at the secondary level align to the students' interpsychological development on the social level due to their proximity to the instructor and other students. The teacher's perceived level of importance of agricultural mechanics skills is aligned to the intrapsychological development, which emerged as a result of their interpsychological foundation. This lead the researchers to ask if the agricultural mechanics skills received at the secondary level impacts teachers perceptions of what agricultural mechanics skills are important to teach.

Purpose and Objectives

The purpose of this study was to determine if the quantity of agricultural mechanics training received at the secondary level impacts teacher perceived importance of the agricultural mechanics skills that they teach at the secondary level. This research aligns with section 2c subsection B of the AAAE national standards for teacher-education in agriculture, which specifically states that teacher candidates need to be competent in agricultural and mechanical systems (Doerfert, 2011). The following objective was identified to address the purpose of this study: Describe the relationship between teacher perceived importance of agricultural mechanics skills and the quantity of agricultural mechanics training received at the secondary level.

Methodology

This study utilized descriptive research methods to summarize characteristics and attitudes of a norm (Ary, Jacobs, Razavieh, & Sorenson, 2006). The population consisted of 130 Iowa secondary agricultural educators that attended the Iowa agricultural education teachers' conference. A print based survey was distributed to the 130 secondary agricultural education teachers at the teacher's conference. Of the 130, (*n* = 103) surveys were returned for a response rate of 79.2%. We examined the relationship between the quantity of agricultural mechanics training received at the secondary level and the teachers' perceived level of importance to teach agricultural mechanics skills. PASW Statistics 18 was used to analyze Spearman Rho correlations to determine if any significant ($p < .05$) relationships existed. It should be noted that each skill area was correlated within the respective area and not representative of a composite of all sub-constructs. For example, Electrical Safety received at the secondary level is correlated to perceived importance to teach Electrical Safety.

Results/Findings

There was a significant positive correlation between 32 of the 54 skills. The five highest correlations are included in Table 1; and includes woodworking power tools, oxy-acetylene brazing, legal land descriptions, small engine services- 2 cycle, and wiring skills (switches & outlets).

Table 1
Spearman Rho Correlational Relationships between the Quantity of Agricultural Mechanics Training and Skills Received at the Secondary Level and Teachers Perceived Importance

Skill Area	*n*	Spearman Rho Correlation
Woodworking Power Tools	91	.473**
Oxy-acetylene Brazing	91	.437**
Legal Land Descriptions	83	.429**
Small Engine Services - 2 Cycle	83	.340**
Wiring Skills (Switches & Outlets)	89	.320**

Note. **p < .05

Conclusions/Implications/Recommendations

The results of this study indicate that skills taught in secondary schools had a significant relationship with the teachers' viewed importance of teaching those same skills. The findings from this study supports Vygotsky's (1978) social development theory. The content teachers were exposed to in the social setting (as students), has reemerged intrapsychologically today in their teaching. Knowing that experience at the secondary level has an impact on content teachers view as important, post-secondary teacher educators and industry should continue to help beginning teachers receive additional training and support in agricultural mechanics at the local level. It should be noted that limitations within this study may exist including a teacher's ability to remember the content they learned in high school, if in fact they were actually exposed to agricultural mechanics in the secondary level, and if the technology existed when the participants were enrolled in an agricultural mechanics course.

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Encouraging Undergraduate Students in Agriculture to Pursue International Experiences: Preference and Motivation

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Encouraging Undergraduate Students in Agriculture to Pursue International Experiences: Preference and Motivation

Introduction and Need for Research

International learning experiences are critical to undergraduate education as they provide the "knowledge and skills students need to be globally competent" (Bunch, Lamm, Israel & Edwards, 2013, p. 217). From 1992 to 2002, the number of scholarly papers about study abroad increased by more than 300% (Cubillos & Ilvento, 2002). "In-depth global knowledge and first-hand international experience" are important for students entering the workforce and essential for future leaders (McGowan, 2007, p. 65). Research has shown that study abroad is essential to the development of transnational professionals (Jackson & Nyoni, 2012) and that international opportunities prepare students to succeed in a global work environment (Harder & Bruening, 2008). In the 21st century, it is imperative that students can navigate foreign cultures and people to succeed in a global economy (Douglas & Jones-Rikkers, 2001). Multinational companies recognize the cross-cultural skills and language ability gained through international experiences and are now targeting graduates with those experiences (Bruening & Frick, 2004). However, studies show that undergraduate students in agriculture are not very engaged in international experiences (Bunch, et al., 2013). It is imperative to determine desired program characteristics that motivate students to gain an international experience and also document preference so that experiences can be established that meet student needs.

Theoretical Framework

The theory of planned behavior (Ajzen, 2006) served as the theoretical framework of the study. "In combination, attitude toward the behavior, subjective norm, and perception of behavioral control lead to the formation of a behavioral intention" (p. 1). We approached the study with the intention of documenting student beliefs and attitudes toward participation in international experiences in order to identify interventions and program characteristics that might impact student behavior.

Methodology

Survey methodology was implemented for this descriptive study during spring 2014 and a total of 194 enrolled students completed the instrument, of whom 182 were undergraduate students pursuing a degree in agricultural leadership, education, and communications. The survey was based upon the work of Briers, Shinn, and Nguyen (2010) and included multiple-choice, Likert-type, ranking, and open-ended questions to gain insight into student preference and motivation related to choosing to participate in an international experience.

Results

In total, 182 undergraduate students of interest completed the online questionnaire. There were 68 male (37%) and 114 female (63%) participants. A majority of the respondents indicated "white only" as their ethnic origin (79%, n=144) with a few Hispanic (12%, n=21), "black only" (6%, n=11), and other (4%, n=6) respondents. Only 13% (n=24) of the respondents spoke a language other than English, including Spanish (9%, n=17), French (1%, n=2) and eight other languages each spoken by one respondent. A majority of the respondents were 21 or 22 years of age (61%, n=111). The students represented four undergraduate majors within agricultural leadership, education, and communications: agricultural communication (30%, n=55), agricultural leadership (32%, n=58), agricultural science (17%, n=31), and university studies – leadership studies (21%, n=38). Only 7% (n=13) of the students noted receiving a full scholarship to attend Texas A&M University. There were 119 students (65%) that indicated they borrow money through federal or private loans.

A majority of students had pursued an international experience (60%, n=109). A small portion had no interest in completing an international experience (13%, n=24). It was clear that students preferred a study abroad program sponsored by Texas A&M University or an internship rather than other international opportunities. Additionally, the students indicated a strong preference for programs that were three to six weeks in length.

Respondents were asked to provide up to four countries they would consider for an international experience. In total, 681 responses were given by the 182 students. Italy (11%, n=75) and Australia (10%, n=68) were the most popular countries followed by Spain (8%, n=55), England (7%, n=51), France (7%, n=48), and Germany (7%, n=45). In total, 56% (n=382) of the responses from students were for countries located in Western Europe. The next most desired regions of the world were Latin and South America (16%, n=112) and Oceania (13%, n=91). In total, 73 countries or regions were listed including countries on all continents except Antarctica. The most important factor in selecting an international experience was program cost, followed by the country itself, the program subject matter, and cultural attractions in the area.

Conclusions

Our results show there is an overwhelming desire for agricultural leadership, education and communications undergraduate students to pursue an international experience. The students were primarily motivated to pursue an international opportunity for the life experience gained. Students also cited the chance to live in another culture or country, resume enhancement, and increasing their employability. The country, subject matter, and cost are important considerations in program selection with cost being the primary factor and Western Europe being the most desired location. The students prefer three to six week study abroad programs coordinated by Texas A&M University or an international internship. Our results reveal that very few students receive full scholarships to attend Texas A&M and many rely on loans to pay their tuition and fees.

Implications and Recommendations

It is imperative for colleges of agriculture to create international programs that meet the desires of their students without exceeding their limitations. The programs must be affordable, preferably in Western Europe, and clearly communicate the life experience and cultural awareness that will be gained. Further research is needed to determine the financial breaking point for pursuing an international experience as well as the mix of academic content and cultural components that students' desire.

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Environmental Learner Outcomes Assessment: How do Department of Agricultural Education and Studies Students Compare to National Norms?

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Environmental Learner Outcomes Assessment: How do Department of Agricultural Education and Studies Students Compare to National Norms?

Introduction/Conceptual Frame

"Consumers and policy makers must have access to information that is critical for informed decision making about agriculture, food, and natural resources" (Doerfert, p. 12). To meet this goal, [College] developed a set of learner outcomes, which includes environmental awareness and is expected of all baccalaureate degree recipients. This study provides a departmental benchmark regarding environmental awareness to assist faculty "to continually improve student achievement" (College of Agriculture and Life Sciences, n.d.), Learner Outcomes Assessment para. 1).

Environmental awareness has been measured previously by the National Environmental Education and Training Foundation's (NEETF) survey from the National Report Card on Environmental Attitudes, Knowledge, and Behavior (2001). NEETF is a congressionally authorized, private non-profit organization whose purpose is to "help America meet critical national challenges by connecting environmental learning to issues of national concern" (NEETF, 2001, n.p.). Agricultural Education and Studies Department (AGEDS) faculty selected the NEETF survey to determine graduates' attainment of environmental knowledge while at the same time providing a national benchmark with which to compare. As part of a larger, comprehensive assessment, this study assessed AGEDS graduating seniors' knowledge environmental awareness.

Methods

All senior level undergraduates (N = 80) who had applied for graduation from AGEDS by April 23, 2014 were considered the population for this study. AGEDS graduating seniors (N=80) were assessed by means of the online survey instrument Qualtrics®. Sixty-three responses were received for a 78.8% response rate. Students received an invitation to participate via an email message with an embedded link to the survey. Appropriate follow-up reminders were sent following the tailored design method (Dillman, Smyth, & Christian, 2009). In addition to environmental attitude, activity participation, and demographic questions, the NEETF instrument contained 12 questions related to environmental knowledge.

To address non-response error as a threat to external validity twenty non-respondents were contacted via telephone according to the recommendations of Dollisso and Martin (1999). Five non-respondents agreed to complete the survey over the telephone. Since less than 20 non-respondents provided data, the responses were merged and the first half of the respondents were compared with the second half using t-tests to determine potential differences (Lindner, Murphy, & Briers, 2001). Since no statistically significant differences were found, responses were merged and are presented together. Frequencies and percentages of responses were calculated and compared to national survey responses.

Results

Student responses to twelve close-ended questions were compared to the National NEETF study respondents from 1997 and 2000. AGEDS graduating seniors provided a higher percentage of correct answers to 11 of the 12 questions when compared to respondents to the national study. Fifty-one percent (*n*=30) of the students correctly identified the largest source of carbon monoxide in the United States from a list of four choices. AGEDS graduating seniors' correct responses are displayed with the NEETF 2000 and 1997 results in Table 1.

Table 1

[Department] Graduates' Responses to NEETF Environmental Knowledge Questions Compared to National Report Card Responses (1997 & 2000)

Question #	Content of Environmental Knowledge Questions	2014 [Dept]	2000 Nat'l	1997 Nat'l
1	Definition of biodiversity	96.5%	41%	40%
2	**The largest source of carbon monoxide in U.S.**	**50.9%**	**65%**	**69%**
3	How most electricity in the U.S. is generated	71.4%	33%	33%
4	The most common source of water pollution	75.4%	28%	23%
5	Recognition of a renewable resource	80.7%	65%	66%
6	Protection provided by ozone in upper atmosphere	68.4%	54%	57%
7	Where most household garbage ends up	87.7%	85%	83%
8	Federal agency that works to protect environment	94.6%	72%	74%
9	Knowledge about materials considered hazardous waste	87.7%	67%	67%
10	Primary reason for extinction of animal and plant species	93.0%	74%	73%
11	Disposal of nuclear waste in the U.S.	68.4%	57%	58%
12	The primary benefit of wetlands	78.6%	53%	53%

Note: Bold faced font indicates percentage correct below national NEETF responses.

Mean differences between demographics were analyzed by t-test (gender) and ANOVA (major option and minor) on the knowledge questions. There were no statistically significant differences found between the genders in their responses to the knowledge questions. Additional analysis was conducted to determine differences by departmental major/option, academic minor and transfer status. No statistically significant differences were found.

Conclusions, Implications, and Recommendations

AGEDS graduating seniors are knowledgeable regarding basic environmental facts. Students scored higher than respondents to a national survey of environmental knowledge except for one question regarding the primary source of carbon monoxide in the United States. It is recommended that faculty in AGEDS identify coursework and outcomes which support the College's environmental awareness outcome. Once identified, specific content should be mapped to avoid excessive overlap and build appropriate reinforcement. Since many content-related courses taken by AGEDS majors are taken outside of the department, it is critical that the College Outcomes Committee share these results to assist in developing a college-wide scope and sequence for the Environmental Learning Outcome. Once developed, this map will provide important information to improve teaching and advising related to the environmental outcome. Nationally, other agricultural education programs should study the extent to which their students demonstrate environmental awareness.

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Poster Type: Research

Evaluating Interns: An Analysis of Supervisors' Satisfaction of Agricultural Communications Interns

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Evaluating Interns:
An Analysis of Supervisors' Satisfaction of Agricultural Communications Interns

Introduction and Literature Review

Each year, the number of students seeking a college degree increases, creating a more competitive job market for graduates. In order to set students apart from their peers in the job market and gain more practical, career-specific experience, students participate in field-based internships (Gault, Redington, & Schlager, 2000). Internships are important to hiring managers (Gault et al., 2000). Employers hire 96.9% of graduates who had internship experience, and 64.8% of internship supervisors made full-time offers to their interns (National Association of Colleges and Employees, 2014). Additionally, employers indicated they would pay $6,000 more for entry-level employees with internship experience (Norwood & Henneberry, 2006). To provide a better learning experience for students and their supervisors, universities need to evaluate employers' perceptions of their interns and make needed changes to curriculum and/or internship programs (Akers, 2000; Verney, Holoviak & Winter, 2009). Previous studies at Texas Tech University show maturity, acceptance of criticism, punctuality, and proofreading as necessary areas of improvement (Fry & Irlbeck, 2011; Irlbeck & Oshel-Shultz, 2009). These studies also suggest a more thorough internship orientation to improve upon low-scoring characteristics, which Texas Tech University implemented. The theoretical framework of experiential education informed this study. The idea of using an internship as a direct experience in the education of the student was explored (Kuh, Kinzie, Schuh, & Whitt, 2010). Kuh et al. (2010) explained curriculum should be developed based on skills "employers find attractive and useful" (p. 237) and internships are places where students learn to apply the knowledge they gained through course curriculum.

The purpose of this study was to determine if agricultural communications interns at Texas Tech University are meeting the expectations of their supervisors in order to make effective curriculum changes. The researchers sought to discover two objectives: (1) which workplace characteristics were satisfactory and (2) which workplace characteristic needed improvement. This study fits into the National Research Agenda Priority 4: Meaningful, Engaged Learning in All Environments, whereby various learning environments should be examined (Doerfert, 2012).

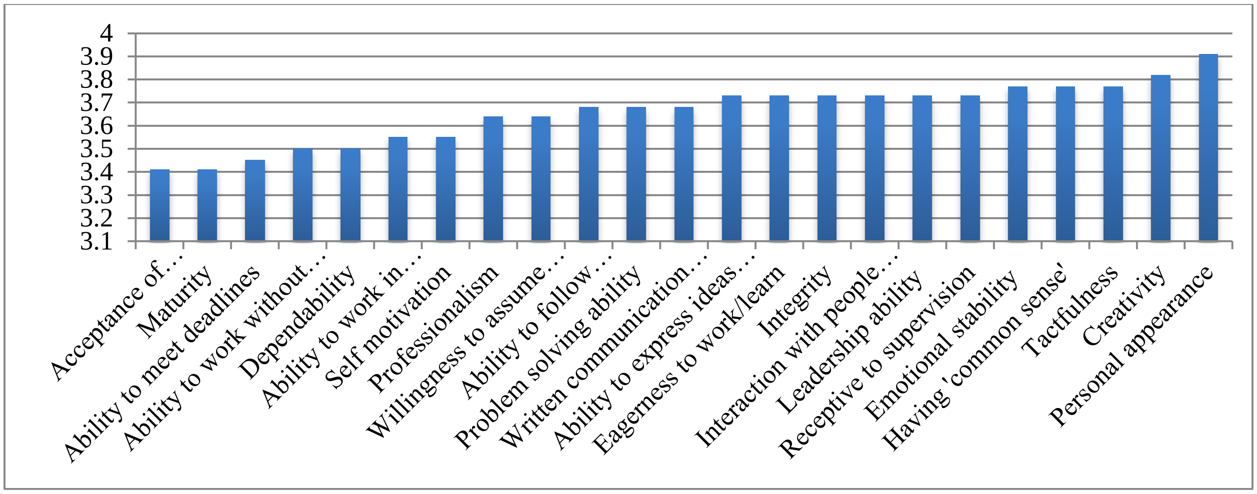
Methods

This study was a replication of previous studies at Texas Tech University in which researchers developed a performance evaluation to allow supervisors to rate their intern(s) (Fry & Irlbeck, 2011; Irlbeck & Oshel-Shultz, 2009). Once the student has completed an internship, his or her supervisor completed an online questionnaire. Supervisors ranked their intern's performance and competence using a four-point Likert-type scale, with one being poor and four being excellent. The characteristics ranked were a variety of soft skills and communications skills. After ranking their intern(s), supervisors were presented with six opened-ended questions asking them to summarize the intern's strengths, weaknesses, greatest gains the intern made, what they would consider to be the perfect job for the intern, recommendations for the intern, and other suggestions on improvement. Evaluations from Fall 2013 to the end of Spring 2014 semesters were evaluated for this study (*N=22)*. Data were analyzed using SPSS.

Results

The data shows “personal appearance” (*M* = 3.91, *SD* = .426), “creativity” (*M* = 3.82, *SD* = .588), and “tactfulness” (*M* = 3.77, *SD* = .429) as the highest-rated workplace characteristics in interns, based upon mean scores. The lowest-rated workplace characteristics included “maturity” (*M* = 3.41, *SD* = .67), “acceptance of constructive criticism” (*M* = 3.41, *SD* = .80), and “ability to meet deadlines” (*M* = 3.45, *SD* = .91). The mean workplace characteristic scores can be seen in Figure 1. The grand mean for workplace characteristics was 3.66 (*SD* =.41).

Figure 1.
Mean scores for workplace characteristics of Texas Tech University agricultural communications interns



The supervisors indicated creativity, willingness to learn, well-spoken, dependable and self-motivated were positive characteristics of their interns. Respondents reported interns gained field knowledge, confidence, professionalism, and maturity. When asked what the perfect job for the intern would be, the majority of the respondents indicated communications-related fields. Respondents were also asked about their intern’s weak points, or areas for improvement. Common themes in the comments included attention to detail, communicating with supervisor, punctuality, improved technical and creative skills, and proofreading. Several supervisors mentioned they would like to have more contact with the students’ professors during their internship. As for recommendations for the intern, respondents commonly listed accepting constructive criticism, asking questions, mastering skills, and learning time management.

Conclusion and Recommendations

Overall, supervisors were satisfied with their intern’s performance. The results were consistent with the previous studies that suggested intern maturity levels and acceptance of constructive criticism were the lowest rated characteristics (Fry & Irlbeck, 2009). Improvement was observed in most areas from the 2012 study, with the exception of ability to meet deadlines, which decreased slightly. Some respondents indicated a need for further communications skill development. Based on the results of this study, interns need to improve acceptance of constructive criticism, maturity, and time management type skills. Although maturity cannot be taught, faculty can add time management, peer critiques of student work, and activities to promote self-reflection and personal growth into their lessons. For future research, more specific questions need to be developed in the area of time management skills as well as questions that address what skills the interns’ lack.

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Research Poster

Examining E-Extension: Diffusion, Disruption, and Rate of Adoption Among Iowa Extension Professionals

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Examining E-Extension: Diffusion, Disruption, and Rate of Adoption Among Iowa Extension Professionals

Introduction

The U.S. Cooperative Extension system has been providing research-based information to improve the quality of life for its citizens for more than a century. The organization has been broadening its engagement and economic efficiency to create an Extension system that utilizes more online learning technologies to supplement Extension's supply-oriented distribution system with a demand-oriented system to deliver content anytime and from anywhere using the Internet (King & Boehlje, 2000).

eXtension—*America's Research-based Learning Network*™ provides an online presence for Cooperative Extension. eXtension combines the efforts of U.S. land-grant institutions to provide public access to research-based, peer-reviewed educational materials developed by Extension professionals (eXtension, 2014). How new technologies, particularly eXtension, have been adopted by Extension professionals has yet to be examined in Iowa. Understanding how eXtension is used and perceived among Iowa Extension professionals is key to providing an online learning environment that is relevant, engaging and valuable to users.

Since the official launch of eXtension, the online technology has not been adopted and utilized by Extension professionals and clientele across the U.S. to the extent that founders envisioned it would (Kelsey et al., 2011). Millions of dollars have been and continue to be invested in eXtension (Harder 2007), which has some state Extension systems questioning the financial sustainability and future of the technology (King and Boehlje, 2013). How the influx of new online learning technologies are being accepted or rejected by Extension professionals have yet to be examined in the state of Iowa. Understanding the mindset and culture of Iowa Extension professionals is the key to providing an online learning environment that is relevant, engaging and valuable to users. The purpose of this study was to assess the perceptions of eXtension held by Iowa Extension professionals and their rate of adoption of the online resource.

Theoretical Framework

The diffusion of innovations (Rogers, 2003) theory provided the theoretical framework to assess the acceptance of eXtension among Iowa Extension professionals. Rogers's theory was used to determine Iowa Extension professionals' current stage in the innovation-decision process—no knowledge, knowledge, persuasion, decision, implementation, or confirmation (Rogers, 2003, Li, 2004). Rogers's theory was also used to assess perceptions of eXtension's relative advantage, compatibility, complexity, observability, and trialability.

The current study also assessed whether eXtension was perceived to have the attributes necessary to create new value for Cooperative Extension through the disruptive innovation using the following attributes: affordability, accessibility, capacity, responsiveness, and customization (Christensen, Anthony, & Roth, 2004; Christensen, 1997; Franz & Cox, 2012).

Methodology

This descriptive survey research study targeted 975 extension professionals in Iowa. A census was conducted using an online questionnaire. The questionnaire contained five sections examining (a) stage in the innovation-decision process, (b) perceived diffusion of innovation characteristics of eXtension, (c) perceived disruptive innovation characteristics of eXtension, (d) background characteristics of Iowa Extension professionals, and (e) open-ended questions on eXtension. Validity and reliability of the questionnaire were established by a panel of experts and through a pilot test. Data collection followed the Tailored Design Method (Dillman et al., 2009). The study population was contacted up to five times by the researchers, including a pre-notification e-mail, an email with instructions and a link to complete the study, two follow-up email reminders, and a mailed postcard. Early survey respondents (first two weeks, *n*=350) were compared to late respondents (last two weeks, *n*=79) in an attempt to control for nonresponse error and to enhance the external validity of the study (Miller & Smith, 1983).

Findings

A final response rate of 44% (*n*=429) was obtained. The comparison of early and late respondents suggests that the results are generalizable to the entire population with one exception. Early respondents had a higher level of educational attainment than late respondents.

Of the five stages in Rogers's (2003) innovation-decision process, respondents selected one stage of adoption that aligned with their current acceptance of the technology. Results indicated that 25% (*n*=109) of respondents remain at the no knowledge stage of eXtension, 16% (*n*=68) of respondents were at the knowledge stage, and 33% (*n*=139) were at the persuasion stage of adoption. Less than 1% (*n*=3) of study respondents were at the decision stage, 15% (*n*=65) were at the implementation stage, and 10% (*n*=42) were at the confirmation stage.

Results from the study show that Iowa Extension professionals perceived eXtension to exhibit the diffusion of innovations attribute of relative advantage, but respondents neither agreed nor disagreed that the eXtension technology exhibited Rogers's (2003) theoretical attributes of compatibility, complexity, observability, and trialability. eXtension was perceived by respondents to exhibit the disruptive innovation theoretical attributes (Christensen, 1997) of accessibility and capacity. Respondents had neutral perceptions of eXtension's affordability, responsiveness, and customization characteristics of the disruptive innovation theory.

Conclusions, Implications and Recommendations

One quarter of Iowa Extension professionals, who responded to the survey, had no knowledge of eXtension. Only a small portion of the population indicated using eXtension in their work. The majority of respondents have already made a decision concerning whether or not they would use or not use eXtension in their work. These findings show that Iowa Extension professionals have been active critics and intentional abstainers of eXtension as the majority of Iowa Extension professionals have made a conscious decision to reject eXtension.

eXtension has the potential to become a disruptive innovation based on Iowa Extension professionals' favorable perceptions of the accessibility and capacity attributes. Further research is needed to examine the perceptions and adoption of eXtension, particularly research using the disruptive innovation theory in Cooperative Extension. Understanding how to foster an organizational culture accepting of disruptive innovations will aid in creating an Extension organization that is adaptable and relevant in the 21st century.

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Fracking frames: A framing analysis and comparative study of hydraulic fracturing coverage in American newspapers.

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Fracking frames: A framing analysis and comparative study of hydraulic fracturing coverage in American newspapers.

Introduction & Need for Research

Science is generally prone to controversy as technical decisions often become politically charged. Hydraulic fracturing is currently a controversial topic in the media and is worthy of further exploration to understand the types of frames being used to communicate the issue. Despite the risk that may be associated with fracking, there are other implications of the frames used to discuss this issue. It may be argued that policy development on fracking could be viewed as the ultimate resolution to the issue. However, factors such as issue knowledge and public acceptance will likely contribute to policy development in terms of time and content. Therefore, frames created around the issue of hydraulic fracturing should be examined.

As frames have the potential to influence public opinion and knowledge, public acceptance and policy development, this study may lend further insight to the state of the issue and help to predict what lies ahead. Therefore, this study provides information on how the issue of fracking might play out over time. Furthermore, this study will aid in the American Association for Agricultural Education's National Research Agenda by furthering its priority area number one, public and policy maker understanding of agriculture and natural resources (Doerfert, 2011).

Theoretical Framework

Frames are tools for making complex issues easier to understand (Scheufele & Tewksbury, 2007). When issues are complicated and complex, frames are used to make sense of relevant events and suggest issues (Gamson & Modigliani, 1989). Frames also hold potential to suggest relevancy to issues and also what can be overlooked or unworthy of attention (Nisbet and Huge, 2006).

Chong & Druckman (2007) asserted that frames work by arranging everyday reality by: 1) making new beliefs (availability), 2) making certain beliefs accessible, and 3) making beliefs "strong" (applicability). Scheufele and Tewksbury (2007) argue, however, that framing is not based upon accessibility and assert that framing assumes that the way an issue is shared in the news influences the audience's understanding of the issue.

Frames are often presented in packages and offer a variety of devices such as metaphors, exemplars, catchphrases, depictions, and visual images to encourage a way of thinking about an issue (Gamson & Modigliani, 1989). Pan & Kosicki (1993) add that framing "views news texts as consisting of organized symbolic devices that will interact with individual agents' memory for meaning construction," (p. 58). The variety of devices may be further used for collective action frame generation, which occurs by articulation and amplification (Benford and Snow, 2000).

Methodology

To analyze frames associated with the issue of hydraulic fracturing, quantitative content analysis was used to evaluate dominant frames found in regions practicing fracking within the United States from 2010 to 2013. Content analysis is "a research technique for making replicable and valid inferences from data to their context," (Krippendorf, 1980, p. 21). Variables are identified and assigned numbers in the content to demonstrate variation. Content analysis is also a useful method for identifying and examining trends and patterns within documents (Stemler, 2001).

Articles were collected using the Lexis-Nexis database for all newspapers included in the study except for the *Chicago Sun Times*, which relied upon the NewsBank database. Articles were identified in the databases by searching for the terms “hydraulic fracturing” or “fracking” within the time period of January 1, 2010 to October 31, 2013. Coding was based upon region featured, newspaper name, publish date, section of paper, article type, word length, sources referenced, author, overall tone, dominant frames, and image accompanying the article. Duplicates and irrelevant articles were eliminated from the study. Content analysis was conducted on 203 news and feature stories. To establish reliability, two researchers coded 10 percent of the sample and compared results using the inter-coder reliability test. Before comparison, the researchers were in agreement 88 percent of the time, and after discussion, the researchers came to agreement 96 percent of the time.

Results

Colorado was featured as the main region in 45 of the articles (22.2%), the nation was featured in 48 of the articles (23.6%) and New York was the most prominently featured region with 49 articles (24.1%). News and feature stories featuring fracking increased each year examined in the study. Eleven articles appeared in 2010 and 77 appeared in 2013. Articles were most commonly framed in terms of community activism (14.3%) followed by government involvement (11.8%). Interest groups were most commonly cited as sources in the articles examined (51.2%), followed by industry representatives (45.8%), and political leaders (41.3%). The majority of the articles were written with a neutral tone (157 articles, 77.3%), while 33 (16.3%) articles were framed negatively, and 13 (6.4%) articles were framed positively.

Conclusions

Bauer (1995) demonstrates that over time science and technology issues often build up to a peak of press coverage and then decline. With the number of news and feature articles increasing each year examined in this study, it seems reasonable to assume that fracking is a topic following the path similar to other science issues. It appears that the issue raises a variety of questions for various stakeholders, and a likely result is that more media attention will be paid to the issue of hydraulic fracturing.

While the articles were framed in a variety of ways, the indication of community involvement may suggest the role community members are taking against or in favor of the issue. Fracking may be applied to Nisbet’s (2009) claim that policy action on environmental issues, will only take place when people get involved and grant acceptance on an issue.

Jasanoff (1987) found that science, policy, and science-policy are difficult to distinguish because often, the efforts to do so are politically charged, and the way an issue is characterized influences the way it’s decided procedurally and institutionally. This study demonstrates that fracking is both a science and political issue, and will likely continue to be woven into public policy agendas, which will impact communities.

Implications

This study provides an example of how a contemporary agricultural science issue is being framed in the media. Agricultural communications scholars should consider future studies that evaluate frames on the issue in future years, as it is likely that the issue will face a variety of factors or events before resolution. Framing analyses of fracking or other agricultural issues may lend insight to the future of other issues facing the agricultural industry.

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Generational Differences in Food Safety Behaviors and Obtaining Food Safety Knowledge

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Generational Differences in Food Safety Behaviors and Obtaining Food Safety Knowledge

There are approximately 48 million foodborne illness cases every year in the U.S. (Center for Disease Control and Prevention [CDC], 2011). While consumers have become increasingly concerned about the safety of their food (Brewer & Rojas, 2008), research shows consumers believe foodborne illnesses are less common to be contracted in their home. Consumers have reported consistent hand washing behaviors during food preparation (Cody & Hogue, 2003; Leal, Rumble, & Lamm, 2015); however, they are less consistent with food safety behaviors when eating raw foods, carrying out other preparation practices, and reading food safety labels (Altekruse, Yang, Timbo, & Angulo, 1999; Cody & Hogue, 2003; Leal et al., 2015). In comparison, young adults are less likely to wash their hands before food preparation, ensure correct food storage temperatures, and follow proper food preparation behaviors (Abbot, Byrd-Bredbenner, Schaffner, Bruhn, & Blalock, 2009; Mayer & Harrison, 2012). Videos, YouTube, recipe demonstrations, the Internet, and social media were all identified as preferred delivery methods of food safety information for young adults (Mayer & Harrison, 2012). While Americans participate in risky food behaviors everyday (Brewer & Rojas, 2008), they are actively interested in receiving food safety information (Cody & Hogue, 2003). Self-efficacy has been another powerful tool to connect food safety behaviors with particular outcomes and encouraging food safety action (Medeiros, Hillers, Kendall, & Mason, 2001b; Schafer, Schafer, Bultena, & Hoiberg, 1993). Reducing foodborne illnesses by 10% would prevent approximately 5 million annual sicknesses (CDC, 2011). Literature shows inconsistent food safety behaviors between general consumers and younger generations (Abbot et al., 2009; Altekruse et al., 1999; Cody & Hogue, 2003; Leal et al., 2015; Mayer & Harrison, 2012). Therefore, the purpose of this research was to determine if there were associations between generations and food safety behaviors, and to describe where different generations learn about food safety. Millennials (1977-1992), Generation X (1965-1976), and Baby Boomers (1946-1964) were the generational focus in this study (Zickuhr, 2010).

Conceptual Framework

The social cognitive theory served as the guiding framework for this research, which characterizes the interaction of personal, behavioral, and environmental determinants to obtain new information for future use (Bandura, 2001). Learning within the social cognitive theory is acknowledged as either enactive or vicarious (Schunk, 2012). Enactive learning occurs through the action of performing behaviors with only positive outcomes repeated. Vicarious learning occurs through the observation of others, which is quicker and does not result in the consequences of actually performing the behaviors (Schunk, 2012).

Methods

An online survey was sent to Florida residents 18 years and older. An opt-in panel using non-probability sampling methods was used to recruit 770 respondents, with 500 completed responses. Non-probability sampling is comparable to, and in some instances better than, probability samples. Respondents' demographics were weighted to be reflective of the Florida population according to the 2010 census data (Baker et al., 2013). This study only looked at respondents from the following generations (n = 453): Millennial (n = 132), Generation X (n = 106), and Baby Boomers (n = 215). A panel of experts reviewed the questionnaire for content and face validity (Ary, Jacobs, & Sorensen, 2010). For this study, two questions from the questionnaire were examined. The first question was adapted from a previous study

(International Food Information Council Foundation, 2014) and examined food safety behaviors using a 10-item, five-point Likert-type scale with the following labels: 1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *always*. The second question asked respondents to select where they learned the most about food safety behaviors. A Pearson's chi-square test was performed to identify associations between generations and food safety behaviors. Descriptive statistics were used to analyze where the generational groups learned about food safety.

Results

Out of the 10 safety behaviors examined, five were identified as having an association with the generation of the respondents ($\alpha = .05$). Washing produce before eating ($p = .003$) and defrosting frozen foods in the refrigerator or microwave ($p =.000$) had the most significant association with generation. Half of the Millennial respondents (49.6%, $n = 65$) reported always washing produce before eating; however, 69.8% ($n = 74$) of Generation X and 72.0% ($n = 154$) of Baby Boomer respondents indicated they always followed the behavior. Only 18.9% ($n = 25$) of Millennial respondents reported always defrosting their food in refrigerators or microwaves compared to 46.7% ($n = 49$) of Generation X respondents and 36.7% ($n = 153$) Baby Boomer respondents. There were also significant associations between the three generations and separating raw meat from ready-to-eat food ($p = .029$), peeling the skin off of edible produce before consuming ($p = .046$), and looking at expiration dates before eating ($p = .019$). Among these three behaviors, Millennial respondents reported always following the food safety behavior less than the Generation X or Baby Boomer respondents. When asked where they received the most food safety information, Millennial (28.8%, $n = 38$), Generation X (28.6%, $n = 30$), and Baby Boomer (24.8%, $n = 53$) respondents identified learning from their parents most often.

Discussion and Recommendations

A significant association was identified between Millennial, Generation X, and Baby Boomer generations with five of the 10 food safety behaviors. For those five behaviors, the Millennial generation reported always practicing the behavior less than the other two generations. These findings support previous research concluding young adults participate less in food safety behaviors (Mayer & Harrison, 2012), but also gives a good comparison to other generations. In some cases, like defrosting food in a refrigerator or microwave, less than half of the two older generations always followed the behavior, indicating Millennials are not the only consumers contributing to foodborne illnesses. All generations learned the most food safety behaviors from their parents, learning vicariously through the observation of others (Schunk, 2012). Considering the Millennial generation participated in proper food safety behaviors the least, more effective educational efforts should be identified for the generation. The lack of formal food safety education used by the generations may contribute to the risky food behaviors exhibited by Americans (Brewer & Rojas, 2008). Agricultural communicators should tailor food safety campaigns to their target generation(s). Since Millennials are participating less in food safety behaviors, communicators should utilize young adults' preferred media, like social media (Mayer & Harrison, 2012), to convey proper food safety information. Additionally, agricultural educators should incorporate food safety information into their curriculums to ensure future generations will be properly educated on the topic. Future research should explore food safety and generational differences further to discover how information is being received. Research should expand on the findings in this study nationally to see if the results extend beyond the state of Florida to help reduce the incidence of foodborne illnesses.

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Research

Impact of Influential People and Timing of the College Decision-Making Process

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Impact of Influential People and Timing of the College Decision-Making Process

Nationwide colleges of agriculture have struggled to meet the need for qualified graduates to fill jobs in the food, renewable energy, and environmental industry sectors. Many institutions are still uncertain about which outreach and recruitment processes are effective (DesJardins, Dunbar, & Hendel, 1999). In some cases, administrators have begun to question the value of outreach activities that have traditionally been sponsored and coordinated by colleges of agriculture. Typically the decision to conduct such activities is based on tradition rather than empirical evidence. Acknowledging that a student's college-choice strongly influences his or her professional career (Hossler & Stage, 1992), colleges of agriculture should evaluate strategies to effectively attract students in an effort to continue producing the future professionals needed by the industries they serve.

Chapman's (1981) model of student college-choice served as the theoretical basis for this study. Chapman's model suggests that significant persons such as parents, friends, role models, and school personnel influence students' perceptions of a college. Adapted to this study, Chapman's model would suggest that gaining a better understanding of the role of influential people along with the timing of students' college decisions would enable colleges of agriculture to more efficiently use their recruiting resources by targeting those influential people and by conducting outreach activities during the most critical times in the decision making process.

The purpose of this study was to examine the college decision making process of students entering a college of agriculture in hopes of identifying the most influential people and the time that those decisions are typically made. The following research objectives guided this study:

1) Determine the most influential people on undergraduate agriculture students' college decision-making process.
2) Determine when undergraduate agriculture students' begin and finalize their college choice.

Methodology

The target population for this descriptive study included all incoming undergraduate students entering the Jordan College of Agricultural Sciences and Technology at California State University, Fresno during the fall 2013 (N = 460). A modified version of the Washburn, Garton, and Vaughn (2002) questionnaire was used to assess the influence of various people and to examine when students began and finalized their college decisions. The instrument was reviewed by a panel of experts to establish face and content validity. A pilot test (n = 34) was conducted to determine the internal consistency of the instrument (Washburn et al., 2002). A Spearman-Brown Split-half reliability analysis was performed resulting in a reliability of .70.

An online questionnaire consisting of 74 items was administered through email requests sent to students in the population. The initial email request directing students to the questionnaire was followed by two additional reminders sent at two-week intervals. A comparison of non-respondents to respondents was conducted on student information obtained a priori to control for non-response error (Linder, Murphy, & Briers, 2001; Miller & Smith, 1983). The comparison of grade point average, race, and selected major yielded no notable differences.

Results

Completed instruments were received from 170 of the 460 students in the population for a response rate of 36.9%. Respondents were 67% female and 57% entered the university as freshman, while the remaining 43% were community college transfers.

In regards to the most influential people on students' college decision-making process, the results show that parent or guardian had the greatest influence (M = 3.53 on a 1 to 5 Likert-type scale). Parents were followed by high school agriculture teacher (M = 3.15), relative who attend the university (M = 3.10), friend who attends the college (M = 3.09), and college of agriculture faculty/staff (M = 2.91). The people who had the least influence on students' college choice were their high school science teachers (M = 2.04), community college counselors (M = 2.38), other high school teachers (M = 2.49), friends from high school (M = 2.53), and graduates of the college of agriculture (M = 2.55).

This study also sought answers to the question of when do students begin and finalize their college decision-making process. Results show that 21% of the respondents began this process before 9th grade, 19% during 9th grade, 16% during 10th grade, 25% during 11th grade, 9.5% during their senior year, and 9.5% after high school. When asked about the finalization of their decision, none of the respondents made their decision before the 9th grade, 1.6% decided during 9th grade, 1.6% during 10th grade, 6.3% during 11th grade, 49.2% during 12th grade, and 41.3% made their final decision during community college.

Conclusions

The strong influence of parents and guardians in the college choice process is well documented in the literature (Broeckemier & Seshadri, 1999; Rosato, 1993; Hossler & Stage, 1992). This study was no different, with parent or guardian being the highest rank. It is also interesting to note that high school agriculture teacher was the second most influential. This is especially notable when you consider that the high school science teacher and other high school teachers were near the bottom of the list. These findings support the need to target parents and high agriculture teachers when recruiting students. The university should make every effort to not only interact with students, but also these influential people as they have an important role in the decision-making process. This also lends support for continued relationship building with agricultural education alums as their perceptions of the university will surely be communicated to their high school students whether it is positive or negative.

When examining the timing of the college decision-making process it appears that the freshman year is a crucial time for outreach efforts as 40% of the respondents began their decision process by their freshman year in high school. Even more important, targeting students during their senior year, as nearly half (49.2%) of the respondents made their decision to attend the university during that year. These findings should help guide outreach staff as they schedule their activities and school visits. Attention should be paid to providing freshman with the information needed to begin making an informed decision, while seniors should be provided with relevant information and support that will assist them in making their decision final.

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Impacts of a Skill Development Course on Teacher Candidate Confidence in their Knowledge, Skill, Experience, and Teaching of Common Power Tools

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Impacts of a Skill Development Course on Teacher Candidate Confidence in their Knowledge, Skill, Experience, and Teaching of Common Power Tools

Subject matter knowledge within agricultural education is complicated. When entering into the profession of teaching secondary agriculture, many teachers indicate they are lacking the skills and the confidence to teach components of the Power, Structure, and Technical Systems (PSTS) pathway (Burris, McLaughlin, McCulloch, Brashears, & Fraze, 2010). If a teacher lacks confidence in their ability to perform skills inside of a subject area, then their ability to develop and deliver relevant and well planned curriculum may also be impaired (Hsu & Malkin, 2013; Krysher, Robinson, Montgomery, & Edwards, 2012). Teacher preparation programs have a responsibility to not only provide training in pedagogy; but, also provide opportunity for students to develop technical skills within the subject area(s) (Leiby, Robinson, & Key, 2013; Newton & Newton, 2009; Wallis, 2008). The American Association for Agricultural Education (AAAE) National Research Agenda (Doerfert, 2011) discussed the need for both effective and efficient programs under priority 1. The need in teacher education programs is to make informed decisions on which courses to include (efficiencies) which will impact both skill development and confidence to teach the skill (effectiveness). This research study aims to determine if a skill based course related to the operation of PSTS power tools can increase teacher candidate confidence levels in four areas of knowledge, operational skill, experience, and teaching.

Conceptual Framework

The Psychomotor Skill Development Model provided the framework of this study (Phipps, Osborne, Dyer, & Ball, 2008). Psychomotor skill development is a three-stage process (early cognitive, practice/fixation and autonomy), which frames how students learn and develop skills in agricultural education. (Phipps et al., 2008). In PSTS, one of six integral pathways taught in agricultural education, skill level is an important consideration as confidence of a teacher's skills related to a given subject matter and confidence in teaching are closely related (Hsu & Malkin, 2013; Krysher, et al., 2012). The purpose of this study is to determine if instruction was offered in an introductory course in PSTS, would improve teacher candidate confidence across the Psychomotor Skill Development Model, and ultimately, the confidence to teach this subject.

Method

Teacher candidates in a newly developed power tool skill development course were the population for this study. In the fall of 2013 there were 13 candidates enrolled (8 female, 5 male) and fall of 2014 there were 7 candidates (4 female, 3 male) enrolled. The entire population participated in the study. The instruments were designed for the participants to provide a self-evaluation of their confidence level related to common tools found in the secondary PSTS laboratory. The instruments were evaluated by members of the faculty for face and content validity. The subjects were asked to complete both a pre and post course survey in which they ranked their level of confidence on a scale of 1(being the least confident) to 4 (being the most confident) in four categories for each of the 13 power tools covered in the course. For each tool addressed, the teacher candidate ranked their level in each of the following confidence categories: knowledge of tool (related to stage 1 of the Psychomotor Skill Development Model), skill in operating (related to stage 2 of the Psychomotor Skill Development Model), experience in operating (related to stage 3 of the Psychomotor Skill Development Model), and teaching the tool (preparation for pedagogical training). Once data from surveys were tabulated, a mean score for each tool and an overall composite score (across all tools within confidence categories) and standard deviations were analyzed to determine the change in participant's confidence level.

Results/Findings

The overall composite scores tabulated for each category indicates a positive change in teacher candidate confidence levels. In the knowledge of tool category, a positive difference from the pre to post course surveys for all tools resulted in a composite overall mean difference of +1.32. In the second category surveyed, teacher candidates' perceived confidence in skill of operating tools the overall composite score for all tools was a mean difference of +1.41. Experience in operation, also had a positive overall composite score with a mean difference of +1.46. The final category tested was confidence to teach about the tools covered in the course. Teacher candidates showed significant growth in their self-identified confidence to teach about each of the tools. Overall, the largest gain in confidence for the teacher candidates was in the area of confidence to teach with the overall composite score having a mean difference of +1.80. The standard deviations tightened around the mean from the pre course to the post course surveys.

Conclusion

Teacher candidate participation in a PSTS course focused on power tool skill development does have a positive effect on self-identified levels in the four confidence categories. Teacher candidates reported improved confidence in all confidence categories (knowledge, skill, experience, & teaching), for all thirteen tools covered in the course. This information leads the researchers to believe that offering courses in technical content will positively improve teacher candidate confidence levels in pre service teacher training programs. Teacher candidates show the greatest growth in confidence for the teaching category, thus confirming that a focus on the development of skills are important to the future success of teacher candidates (Russell-Bowie, 2009; Wingenbach, White, Degenahrt, Pannkuk, & Kujawski, 2007; Morgan & Bourke, 2008). By moving teacher candidates across the Phipps et al. (2008) Psychomotor Skill Development Model, teacher candidates are able to increase their confidence in all areas of development.

Recommendations/Implications/Limitations

This course focused on power tool skill development should be a required component to the teacher preparation program at Colorado State University. Further research should be conducted on this subject with future teacher candidates enrolled in this course. This is an important consideration as the larger population studied from the same instrument and constructs can further confirm the conclusions of this study. Further research is also needed within the study in regard to comparing if a teacher candidate's grade in the course corresponds with the level of self-identified confidence they provide on the survey. In addition, follow-up research should be conducted with teacher candidates who completed the course prior to stating their teacher candidate teaching experience, then during, and after. A further follow-up is also recommended after the first and fifth year of teaching.

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Research

Influencing Change: Agricultural Producers' Use of the Texas Alliance for Water Conservation's Communication Efforts

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Influencing Change: Agricultural Producers' Use of the Texas Alliance for Water Conservation's Communication Efforts

Introduction/Need for Research

Agriculture is a vital part of the Texas High Plains economy generating a value of crops and livestock that exceeds $5.6 billion (TAWC, n.d.a). However, the region heavily relies upon the exhaustible Ogallala aquifer for irrigation water, which is a finite resource (TAWC, n.d.a). In response to the growing need to extend the life of the Ogallala aquifer, the Texas Alliance for Water Conservation (TAWC) project was established in 2005 (TAWC, n.d.b). The TAWC is a partnership of agriculture producers, industries, universities, and government agencies with the mission to conserve water 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, n.d., para. 1). The project uses on-farm demonstrations of cropping and livestock systems to collect data then disseminates that information through outreach efforts (TAWC, 2013). The TAWC hosts multiple events such as field days during which producers visit the demonstration sites and attend presentations related to its mission. Additionally, the TAWC provides information through its website, Facebook page, publications, radio program, and more (TAWC, 2013). Priority five of the National Research Agenda (Doerfert, 2011) emphasizes the importance of providing accurate and reliable data that describes the impact of outreach efforts for decision makers. The purpose of this study was to examine agricultural producers' use of TAWC's communication efforts to obtain information about the project and various water conservation techniques. This information could then be used to make decisions regarding their agricultural production practices.

Conceptual Framework

This study draws upon the concept of social marketing, which is concerned with "(a) influencing behaviors, (b) utilizing a systematic planning process that applies marketing principles and techniques, (c) focusing on priority target audiences segments, and (d) delivering a positive benefit for society" (Lee & Kotler, 2011, p. 7). For the TAWC to influence the water management behaviors of the region's agricultural producers, Lee and Kotler (2011) assert the organization has to rely on an integrated media mix comprised of both traditional (personal selling, radio, brochures, etc.) and non-traditional communication channels (interactive Web sites, Facebook pages, Twitter, etc.). The mix must be thoughtfully selected in order to effectively meet the needs of the target audience (Lee & Kotler, 2011).

Methodology

This study followed a quantitative survey research design to collect data from agricultural producers attending the TAWC Water College January 21, 2015. The researcher-developed instrument contained four sections: TAWC involvement, water management practices, water management strategy adoption, demographics and operation characteristics. A 5-point Likert-type scale was used to measure familiarity with TAWC and awareness of water conservation options and techniques (*1 = not at all, 5 = extremely*). Upon approval from the Institutional Review Board, 62 questionnaires were distributed to attendees of the TAWC event. Thirty-three respondents provided sufficient data for analysis. Most respondents were male (n = 28, 84.8%) and the average age was 56 years old. The producers represented 21 Texas counties and one

New Mexico county. Data from the questionnaires were entered in an Excel file that was then opened in SPSS 18.0 for data analysis. Frequencies, descriptives, and independent t-tests were used to interpret the data.

Results/Findings

Eleven of the respondents (33.3%) said they felt somewhat familiar with the TAWC project while 12 (36.4%) were either moderately or extremely familiar with the project. Over 50% (n = 18, 54.5%) reported previously attending a TAWC activity. Summer field days were identified as the most attended activity (n = 12, 36.4%) followed by winter meetings (n = 11, 33.3%), field walks (n = 10, 30.3%) and the farm show booth (n = 10, 30.3%). More than 70% (n = 24, 72.7%) were also engaged with the TAWC as they sought information about the project from non-event resources. The most commonly used source was the project's website (n = 19, 57.6%), followed by TAWC publications (n = 8, 24.2%), the TAWC Field Talk radio program (n = 7, 21.2%), the TAWC Facebook page (n = 7, 21.2%), a member in the project (n = 6, 18.2%), and a producer not in the project (n = 5, 15.2%). Nearly 40% (n = 13, 39.4%) said they are moderately aware of water conservation options and techniques while 30.3% (n = 10) were somewhat aware. There was a statistically significant difference in respondents' awareness of water conservation options and techniques for TAWC members (M = 4.08) and non-members (M = 3.11); $t(28)$ = -3.03, p = .005.

Conclusions

Irrigated agriculture is crucial on the Texas High Plains (TAWC, n.d.a), but efforts are needed to extend the life of the Ogallala aquifer. TAWC's mission is to provide research-based solutions for effective water management. The majority of respondents who attended the TAWC Water College were somewhat to extremely familiar with the project and had previously attended a TAWC activity. Even more had used other TAWC communication efforts to learn more about the project. Respondents indicated a moderate level of awareness regarding water conservation options and techniques. It was found that members of the project had more awareness with these strategies than non-members.

Implications/Recommendations/Impact on Profession

As Lee and Kotler (2011) noted, successful social marketing campaigns rely on the use of multiple communication channels that meet the needs of the target audience. Involvement with the TAWC in the form of project membership, event attendance, and information resources does enhance awareness of various water conservation techniques. This implies that increasing producer engagement with the TAWC will further improve producers' awareness of water conservation. The research also illustrates that producers' prefer to obtain information about the TAWC through its website, but multiple communication channels were being used. It is recommended that the TAWC keep the website a top priority in its outreach efforts, but continue to provide face-to-face workshops and social media content. Additional research is needed to further evaluate the TAWC's communication efforts.

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International Agricultural Concepts through the Eyes of School-Based Agriculture Students

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International Agricultural Concepts through the Eyes of School-Based Agriculture Students

Introduction/Need for Research

The US faces the daunting reality that many high school students are not adequately prepared to successfully meet the demands of a global economy (Jackson, 2008). High school students will have to collaborate, sell, and purchase products with people from around the world and compete at a global level (Center for International Understanding, 2005). According to the Center for International Understanding (2005), "All fields – from agriculture to auto repair, banking to biotech, medicine to manufacturing, teaching to transportation – are increasingly reliant on international business relationships" (p. 3). This sentiment, related to agriculture, is also evident in the American Association for Agricultural Education's national research agenda (Doerfert, 2011). However, students in other industrialized countries have a better knowledge of world issues than students in the US (Roper, 2002). To compete in a global economy, the US educational system should focus on internationalizing the curricula (Stewart, 2007). Studies by Elliot and Yanik (2002), Radhakrishna, Leite, and Domer (2003), and Heinert, Lavery, and Roberts (2014) have helped to further establish the need for an internationalized agricultural curriculum in school-based agricultural education (SBAE) by documenting positive attitudes and beliefs towards international agricultural concepts. The purpose of this study was to identify the attitudes and beliefs of SBAE students in [state] in regards to international agriculture.

Conceptual Framework

Radhakrishna et al.'s (2003) conceptual framework for global awareness and understanding of international agriculture framed this study. Radhakrishna et al. purported "global awareness and understanding of international agricultural concepts by high school and college students can be linked to several factors — international experience and participation, school characteristics, and demographic characteristics, knowledge assessment, and attitude and beliefs toward international agricultural concepts"(p. 542). Attitudes and beliefs, demographic characteristics, and school characteristics were investigated in this study.

Methodology

This descriptive study utilized a questionnaire that Radhakrishna et al. (2003) adapted from Elliot and Yanik (2002). The questionnaire was comprised of 46 items, which measured four constructs and used a five-point likert scale (1 = *strongly disagree* to 5 = *strongly agree*), and demographic questions. The constructs were reliable based on the following post hoc reliability analyses: attitudes (n of 14 items, α =.83), understanding (n of 6 items, .78), attitudes toward instruction (n of 13 items, .86), and beliefs (n of 13 items, α =.78).

Three SBAE programs were purposively selected to participate in this study based on the size of the school and their rural or suburban location. School 1 and 2 have approximately 2000 students each and are located in suburban communities. School 3 has approximately 300 students and is considered a rural community. The target population was comprised of SBAE students at three [state] high schools. The lack of returned parental consent forms prevented some of the target population from participating. School 1 had a total of 38 out of 105 students participate, school 2 had a total of 61 out of 128 students participate, and school 3 had a total of 24 out of 75 students participate making the response rate 40% for the target population. The pen and paper questionnaires were administered in person by one of the researchers or by the high school agriculture teacher. The data were analyzed using SPSS 22, and descriptive statistics were reported.

Results/Findings

The summated means of all students for attitudes, beliefs, understanding, and instruction were 3.81 (*SD* = .46), 3.81 (*SD* = .57), 3.76 (*SD* = .51), and 3.76 (*SD* = .47), respectively. School 1 had more favorable attitudes, beliefs, understandings, and preferences for instruction (Table 1). As shown in Table 2, females had higher means on attitudes, beliefs, and understanding. Males and females had the same preferences for instruction.

Table 1

	School 1		School 2		School 3	
	M	*SD*	*M*	*SD*	*M*	*SD*
Attitudes	3.88	0.35	3.77	0.49	3.80	0.52
Beliefs	3.91	0.42	3.70	0.50	3.70	0.50
Understanding	3.91	0.56	3.76	0.61	3.78	0.48
Instruction	3.83	0.42	3.76	0.56	3.64	0.49

Table 2

	Females		Males	
	M	*SD*	*M*	*SD*
Attitudes	3.83	0.45	3.79	0.47
Beliefs	3.82	0.43	3.72	0.50
Understanding	3.83	0.57	3.80	0.57
Instruction	3.72	0.46	3.72	0.55

Conclusions

The findings of this study align with Elliot and Yanik (2002), Radhakrishna et al. (2003), and Heinert et al. (2014) by providing further evidence that students hold positive attitudes and beliefs toward international agricultural concepts. Also, students agreed they needed a basic understanding of US and world geography and were more likely to understand global agriculture if instruction was provided. Similar to Heinert et al., there were no practical differences found within any of the constructs based on school location or gender.

Implications and Recommendations

This study suggests SBAE students understand the value of being exposed to internationalized agricultural curricula regardless of gender and school location. In an effort to remain a global leader in science and innovation and to meet the needs of the agricultural employers, State Departments of Education should consider providing resources for the development, testing, and implementation of internationalized curricula. Curriculum writers should use information from this study and others to gather concepts that should be included in SBAE curricula. Future research is also warranted to determine SBAE teachers' perceptions of globalized curricula and their content knowledge and pedagogical needs related to international agricultural concepts. Lastly, collaboration should be established between SBAE, agricultural companies and organizations, and higher education to enhance the SBAE student experience.

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Poster Type (Research)

Investigating Beginning Agricultural Teacher Burnout

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Investigating Beginning Agricultural Teacher Burnout

Introduction

Teacher attrition in education has been a concern for many years. Unlike many other non-specialized, general education teaching areas, the attrition of agriculture teachers has resulted in a nationwide shortage of qualified and licensed agriculture teachers (Kantrovich, 2010). Teachers of agriculture generally indicate they are satisfied with their career (Chenevey, Ewing, & Whittington, 2008; Kitchel, et al., 2012; Walker, Garton, & Kitchel, 2004). However, research indicates individuals leave teaching or consider leaving the profession for a variety of personal or professional reasons. Knobloch and Whittington (2002) found teachers indicated stress, working conditions (including lack of autonomy), poor student motivation, student discipline problems, and lack of support or recognition from administration as factors for leaving the profession. Thus, the more we know about these factors that may play a role in teacher burnout the more assistance we might be able to provide in an attempt to lessen the attrition rate.

Literature Review

The condition of burnout has frequently been used by educators as a reason for leaving the profession. The Maslach Burnout Inventory (MBI) is widely recognized as the standard measurement for the psychological condition of burnout (Maslach, Jackson, & Leiter, Maslach Burnout Inventory Manual, 1996). Maslach, Jackson, and Leiter (1996) use a three-dimensional approach to evaluate an individual's level of burnout. The three areas of burnout are emotional exhaustion, depersonalization, and personal accomplishment (Maslach, 2006).

Emotional exhaustion occurs when, individuals who primarily work with other people, have depleted their emotional resources and exhausted their own psychological level of emotional availability (Fives et al., 2007; Maslach & Jackson, 1981; Maslach, et al., 2001). Depersonalization involves impersonal, cynical attitudes and feelings, and sometimes negative feelings or reactions towards others. The third dimension of burnout, a lack of personal accomplishment, otherwise known as inefficacy, is characterized by a dissatisfied, negative self-reflection towards one's ability to fulfill the requirements of the job.

Secondary teachers of agriculture who experience burnout fall into one or more of the three categories of burnout (emotional exhaustion, depersonalization, and personal accomplishment) as identified by the Maslach Burnout Inventory (Maslach & Jackson, 1981; Maslach, Jackson, & Leiter, 1996). Research studies conducted with agriculture teachers indicate they experience a range of low to high levels of each dimension of burnout at varying stages of their career. (Chenevey, Ewing, & Whittington, 2008; Croom, 2003; Kitchel, et al., 2012; Newcomb, Betts, & Cano, 1987; Walker, Garton, & Kitchel, 2004).

Methods

This descriptive quantitative inquiry employed descriptive research methods to address questions about the stress levels of beginning secondary agriculture teachers. The target population for this study was beginning secondary agriculture teachers participating in the Missouri Agriculture Teacher Induction and Mentoring Program. The accessible population consisted of all Missouri beginning agriculture teachers completing their first year of teaching in 2013-2014 (n =47) or 2014-2015 (n = 41). Participant data were collected face-to-face using a paper and pencil instrument. The authors collected 75 usable responses from first-year and second-year agriculture teachers who attended a required statewide meeting for an overall response rate of 85.2%. This response rate exceeded the 85% response rate suggested by Linder, Murphy, and Briers (2001) for non-response concern; therefore, the author conducted no additional procedures for control of non-response error. The respondent makeup included 38 females and 37 males with 37% teaching in a high school with less than 200 students, 34% with 200-399 students, 12% with 400-599 students, and 17% with more than 600 students.

Findings

Beginning agriculture teacher burnout was measured by the Maslach Burnout Inventory (MBI-E) and findings are presented in Figure 1. Based on the interpretations purported by Kitchel et al. (2012) beginning teachers in this study were determined to experience “moderate” levels of burnout in all three categories. Emotional Exhaustion items that were reported to constitute stress more frequently were feeling emotionally drained and used up at the end of the work day. Depersonalization items included feeling blame and becoming more callous toward others. Conversely, teachers did acknowledge the ability to understand others and make a positive difference within the Personal Accomplishment construct.

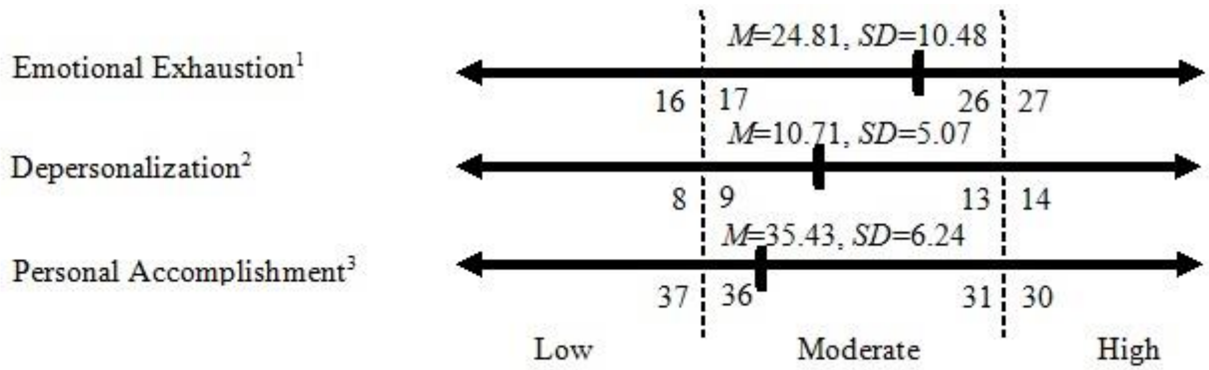

Figure 1. Teacher burnout scale measured by the MBI-E. Interpretations: [1]EE = high (27 or over), moderate (17-26) and low (0-16). [2]DP = high (14 or over), moderate (9-13) and low (0-8). [3]PA (interpreted in reverse of EE/DP) = low (37 or over), moderate (31-36) and high 0-30).

Conclusions, Discussion and Recommendations for Future Research

Based on this study, it was concluded that beginning agriculture teachers experience “moderate” levels of all three constructs of the Maslach Burnout Inventory. Additionally, the means for beginning agriculture teachers were greater than the published established norms for the MBI-E subscales. Thus, beginning agriculture teachers are experiencing a moderate level of burnout that may be a factor leading to considering leaving the profession. Support and resources to assist in combating the sense of burnout need to be made available for beginning teachers.

Recommendations for future research are to evaluate the connection between various demographic variables and the three dimensions of burnout, learn more about the specific workload requirements of beginning teachers to identify key stressors related to the job, and determine the frequency in which teachers experience stress relative to their roles as an agriculture teacher. Additional research may also be conducted with teachers in differing years of experience to compare the three dimensions of burnout to those expressed by beginning teachers. A question to consider may be if burnout lessens with years of experience, or do those teachers who experience the most burnout leave the profession.

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Research Poster Abstract

Looking for a Few Good Men: Insights into the Lack of Male Agricultural Teacher Candidates

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Looking for a Few Good Men:
Insights into the Lack of Male Agricultural Teacher Candidates

Introduction

Supplying quality teachers in the agricultural education profession is a constant struggle. This research directly aligns with Priority 5 - Efficient and Effective Agricultural Education Programs of the AAAE National Research Agenda (Doerfert, 2011) by providing for the developmental needs of diverse learners in all settings and at all levels. This academic year in [State], the percentage of our teacher candidates (N=52) who are female is at 88 percent and early career (years 1 to 3) teachers [N= 108] are at 75 percent (D. Rosson, personal communication. February 18, 2015).

Today, we see a shift in the gender equity of the agriculture education profession. Males have traditionally dominated the agricultural education profession (Whittington & Raven, 1995, p. 12). In 1995, researchers (Whittington & Raven) documented a marked increase in the number of female teachers entering the profession. Gender inequity in the classroom is not just a problem for agricultural education. Johnson (2008) shared that approximately 25 percent of all classroom teachers in the United States were male while [State] was 28 percent male.

Theoretical Framework

The need for more male teachers is important as male students need to have strong male role models, especially at a young age (Johnson, 2008). Johnson (p. 2) further stated, "...stable academic role models for disaffected boys...counter negative attitudes towards schooling, which lead to higher dropout rates and poor achievement." Identifying barriers will help clarify why there is a shortage of males entering the profession. This research is grounded in Social Cognitive Career Theory (Lent, Brown & Hackett, 1994, 2000, 2002) which indicates an individual's personal input (gender) has bearing on career objectives and perceived aspects of the environment influence beliefs, intentions, and actions. Environmental barriers can erode efficacy and career interests.

Methodology

The theoretical perspective of this qualitative study was rooted in phenomenology, and its methodology in phenomenological research. These selections ensured existing understandings of males entering the agriculture teaching profession were cast off, permitting the creation of new understandings and meanings (Crotty, 2003). Reliability was established through the standards of rigor (Ary, Jacobs, Razavieh, & Sorenson, 2006). The study's credibility was secured through the use of peer reviews and member checks. In this study, rich descriptions from the participants support potential transferability of findings. Use of the coding and re-coding process further established dependability. Confirmability is evidenced by the lack of researcher bias. The use of subjectivity statements provided the first line of defense, followed by the use of an expert panel, member checks and an audit trail. Qualitative studies rely on purposive or criterion-based sampling for the insight it brings to the study (Ary et al., 2006). We interviewed all twelve [State] male Teacher Candidates following their 2012-2013 student teaching/intern experience. They were asked "what barriers exist for males to enter agricultural teaching?"

Findings

Three themes emerged as to why males chose not to enter the agriculture teaching profession:

Theme 1: Compensation/Pay

- Amount of money males can make right out of college in industry vs the teaching profession.
- "I just had a student come back to school this past year and told me they just made $170,000 with [utility company] welding."
- "Look at the pay for a new teacher; you're looking at, if you're lucky, $40,000 a year."

Theme 2: "Rah-Rah Leadership" Component

- "I feel that teaching has gone a lot more leadership based…I don't remember it being so rah-rah get spirited…I don't think the males are typically as open to that as maybe the female teachers are…you either embrace it or you just kind of go along with it."
- "I feel what turned me off when I first got into agriculture education was it was more about the rah-rah pom-poms FFA and it was almost like the scope of the direction was away from the roots of agriculture and occupational/industry experience, preparing kids to go to work….. I feel it's moving towards training little politicians."

Theme 3: Credentialing Process-Hoops

- "I know five fellow male agriculture student teachers and they mentioned that they can't handle any of these classes, they've tried the methodology in the classroom and it doesn't work, so they quit teaching altogether."
- "All the classes you have to take that don't mean jack…like diversity, social economic status, gender, sexual orientation..."
- "When compared to other males in college, we had to take an extra year or two for education courses, while our counterparts were already out in the workforce."

Conclusions

Although the participants completed their programs, they clearly identified those barriers preventing their male peers from pursuing the profession. There is a clear gap in compensation luring quality candidates away as they must defer earning an income due to the additional time required to complete the credentialing requirements. The leadership component has driven males away from entering the profession. The perceived lack of value education courses provide is also a serious issue for males not entering the profession.

Implications/Recommendations/Impact on Profession

To attract males into the agricultural teaching profession, three things need to occur:

1) Higher salaries need to be addressed at the state level or subsidized via industry support
2) The credential coursework experience needs to be evaluated for substance and time invested
3) FFA activities need to be evaluated to ensure activities are offered in which male teachers and male students feel comfortable participating in.

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Perceived Comfort of Personal Protective Equipment Among Missouri High School Agricultural Mechanics Students

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Perceived Comfort of Personal Protective Equipment Among Missouri High School Agricultural Mechanics Students

Introduction

Agricultural training for youth often comes in the form of a learning laboratory such as a greenhouse, animal farm, or agricultural mechanics laboratory (Phipps & Reynolds, 1992). Specifically, the agricultural mechanics laboratory provides a means for students to learn in a safe and controlled environment (Langley & Kitchel, 2013), and the use of laboratories has been an integral part of agricultural education programs even before the Smith-Hughes act (Ingersoll & Kralik, 2004). In the agricultural mechanics laboratory, students are exposed to metal working, wood working, agricultural machinery, chemicals, compressed gasses, and electrical equipment all of which have been identified as potentially dangerous (Johnson & Schumacher, 1989). It is the obligation of the instructor to maintain a high regard for the safety of the students while they are in the agricultural mechanics laboratory (Gliem & Miller, 1993). Further, Personal Protective Equipment (PPE) is designed to substantially reduce the risk associated with many hazardous activities and is widely available (Carpenter, Lee, Gunderson, & Stueland, 2002). With previous research identifying the importance of laboratory use in a complete agricultural education program, and the risk reduction benefit of PPE educators must evaluate the process of teaching students while providing a safe environment for learning.

Conceptual Framework

Comfort is a relative term, which is usually determined by a combination of physiological and physical factors (Akbar-Khanzadeh, Bisesi, & Rivas, 1995). As such, improper fit, added weight, and out of fashion style or color make much PPE undesirable to wear. Industrial accident analysis research regarding eye protection suggested workers have barriers to using PPE when comfort is in question (Lombardi, Verma, Brennan, & Perry, 2009). Further, Akbar-Khanzadeh et al. (1995) suggested workers will oppose wearing PPE devices because of discomfort. Likewise, production agriculture research with both adult and youth populations have echoed industrial PPE concerns citing comfortability of PPE having a strong influence on personal decisions to use/not use PPE (Carpenter et al., 2002; Mukhopadhyay, 2009). Thus, research is needed within the agricultural mechanics laboratory regarding the comfort level of students while using PPE in the agricultural mechanics laboratory.

Purpose

The purpose of this research is to describe the comfort level of Missouri high school students while using Personal Protective Equipment in the agricultural mechanics laboratory. To help guide this study data were collected regarding five categories of PPE: 1) Metal working, 2) General, 3) Fire Suppression, 4) Breathing apparatus and 5) Hearing.

Methods and Population

This study utilized descriptive research to gather data from a target population of all Missouri students enrolled in courses within the Power Structural and Technical System career area (N = 21,486). From this population a sample of 742 (n = 742) high school students were randomly selected based on Missouri agricultural education district. Usable data was gathered from 548 (n = 548) students representing each agricultural education district in Missouri establishing a response rate of 73.85%. Data were collected via a mailed questionnaire following recommendations for mailed surveys by Dillman (2007). Authors developed the instrument used for this study and a panel of experts provided face and content validity. Reliability of the instrument was estimated through a pilot study. Reliability coefficient estimates ranged from .74 to .98 across all five constructs. The average student respondent for this study was male (76.27%; f = 418) and 16.33 (SD = 1.29) years old. Student respondents reported having an average 3.06 (SD = 2.22) semesters of agricultural mechanics instruction including the one they were currently enrolled in.

Findings

The purpose of this study was to describe the comfort level of Missouri high school students while using Personal Protective Equipment in the agricultural mechanics laboratory. Students indicated they perceived to be extremely comfortable while using PPE for only two of the five categories; *metal work* PPE (M = 3.53; SD = .55), and *general* PPE (M= 3.66; SD = .58) Further, perceived comfort dropped slightly with respondents feeling mostly comfortable while using PPE regarding *fire suppression* (M= 3.39; SD = .82), *hearing* (M= 3.22; SD = .1.02), and *air quality* PPE (M= 2.77; SD = .1.16). However, at least 25% (f = 134) of students in the agricultural mechanics laboratory indicated *hearing* PPE and *air quality* PPE were not available or not used in their laboratory.

Implications and Recommendations

Providing a safe learning environment for students is the most important job of any agriculture mechanics instructor (Swan, 1992) and students in this study indicated they were at least *mostly comfortable* across five categories of PPE used in the agricultural mechanics laboratory. Since most PPE usage is based on knowledge, attitudes and beliefs rather than policy (Carpenter et al., 2002) these findings are encouraging for agricultural educators. The high usage of most PPE categories could imply students are helping to reduce the risk of injury in the agricultural mechanics laboratory based on felt need rather than safety policy.

While the majority of students in this study indicated to be at least *mostly comfortable* using various forms of PPE the researchers express concern regarding one-fourth of the students perceiving there to be no hearing or air quality PPE available. This is particularly troublesome when you consider 29% of farmers using similar equipment reported definite hearing loss (Carpenter et al., 2002). Furthermore, research specifically in the agricultural mechanics laboratory has indicated noise levels exceeding the OSHA maximum exposure of 110 decibels for 30 minutes (Miller, 1989). These findings could imply the lack of PPE being used in the agricultural mechanics laboratory is providing precedence for work outside the school.

Research should be conducted to determine what specific PPE is available, what PPE is not provided, and what PPE is provided but not used. Further, investigation regarding the agricultural mechanics laboratory PPE usage and workplace PPE usage should be carried out.

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Perceived Factors that Influence Student Enrollment in a University Agricultural Sciences Program

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Perceived Factors that Influence Student Enrollment in a University Agricultural Sciences Program

Introduction/Need for Research

The Department of Agricultural Sciences at West Texas A&M University has seen a 37.05% increase in undergraduate enrollment from the fall of 2008 to the fall of 2012. Although it is believed this increase is in reference to time and money spent in recruitment efforts toward students, there is no specific data to support this conclusion. When looking at past studies toward recruitment of students enrolled in university agricultural programs across the nation there is a wide-range of conclusions. However, there is one shared conclusion, parents are a major influence on a student's choice of major and institution (Rocca and Washburn, 2005; Wildman and Torres, 2001; Herren et al., 2011; Rayfield et al., 2013). In terms of influences as informational sources, Herren et al. found campus visits and personal conversations with a professor to be the most influential. On the opposite end of the spectrum, one of the least influential resources, as an information source, were visits by university personnel to selected high schools. Shrestha et al., (2011) reported family and friends were the largest source of information and campus visits were the smallest source of information.

Theoretical Framework

One of the most well-known models of recruitment is the Chapman's Model of Student College Choice. Chapman's Model of Student College Choice (1981) expresses there are two areas that influence college choice – student characteristics and external influences. The student characteristics encompassed socioeconomic status, aptitude, level of educational aspiration, and high school performance. As for the external influences, this included: the influence of significant persons, fixed college characteristics, and college efforts to communicate with prospective students. Chapman indicated external influence comes from parents, counselors, other students, teachers, and college admission officers. Fixed college characteristics cannot be changed with ease, such as: location, cost, campus environment, and desired programs. Cost is one of the leading influences of whether a student will attend a college although it can be reduced with factors such as financial aid. Location can also be a large determiner. Over 50% of first year students will enroll in an institution within 50 miles of their hometown. A college effort to communicate with a student can be described as their marketing approach. However, Chapman stated this model does not exhaust all possibilities, but it does identify major factors.

Methodology

The purpose of this introductory study was to identify influential factors upon students' choice to enroll within a department of agricultural sciences at a selected university. The primary objectives were to first identify the resources new students utilized to gain information about the institution and program, and second identify factors which impacted their decision to enroll. The target population of this descriptive study was branded as students enrolled in an agricultural science program and more specifically freshman students who were registered in a freshman seminar class within the selected department. The instrumentation used in data collection was adapted from Williams (2007), which was adapted from the work of Wildman (1997). Wildman established reliability using test-retest methodology on a pilot group of students (N=25) at New Mexico State University. Face and content validity were established by faculty at [State] University. The sections of the research instrument focused on this abstract included: methods in which participants learned about the identified agricultural department (10 items), individuals who were influential to college choice (11 items), and university characteristics important to choice of said university (25 items). All items in these sections were measured utilizing a five-point Likert-type scale with a 5 indicating an item was very influential. Data collection within the four sections of the freshman seminar course (N=165) resulted in 118 usable surveys for a 71.52% response rate.

Results/Findings

Demographic characteristics showed just under one-quarter (24.6%, n = 29) of survey participants indicated they were the first of their immediate family to attend a university. Almost half (48.3%, n = 57) of all participants stated their hometown was 0-2 hours from West Texas A&M University. During high school, the majority of students were involved in athletics (n=87, 73.73 %), FFA (n = 72, 61.01%), and 4-H (n=57, 48.31%). The average number of dual credit hours transferred in was just over 16 with 66.38% of participants having such credit.

In identifying methods students utilized to gain information about the institution and program, a visit to campus (M=3.57, SD=1.31) produced the highest mean score on the five-point Likert-type scale. This was followed by a personal conversation with a professor on campus (M=3.34, SD=1.52) and next the university Web site (M=2.97, SD=1.25). The three lowest rated items were a visit by a university representative to their high school (M=1.99, SD=1.31), participation in an on campus recruitment program (M=1.90, SD=1.20), and television, radio, newspaper, or magazine advertisement (M=1.65, SD=0.97).

The most influential person participants identified was parents or guardians (M=3.67, SD=1.25) and was followed by university graduate (M=2.54, SD=2.54). The most highly rated university factor upon decision to enroll was cost (M=3.91, SD=1.18). This was followed by faculty's friendliness in the department (M=3.76, SD=1.26), friendly atmosphere in the department (M=3.75, SD=1.28) class size (M=3.72, SD=1.20) and majors offered (M=3.68, SD=1.19). The least influential people were high school counselor (M=1.87, SD=1.28) and high school administrator (M=1.68, SD=1.08). The university factor with the lowest rated influence was prominence of university athletic teams (M=2.44, SD=1.45).

Conclusions/Recommendations

A campus visit was the most significant method for students to gain information about their chosen university. A personal conversation with a university professor and the university website also showed to be useful information sources. Parents or guardians were clearly the most influential person upon survey participants. The most influential university factor upon decision to enroll was cost followed by a perceived friendliness of agricultural faculty as well as the department as a whole.

Recommendations are made to continue quantitative and qualitative data collection with future audiences of incoming agricultural students to better determine what external factors are bringing them to this university. As well data should be analyzed to see if any factors can be identified which might impact a students' decision to persist through the university and department. The value of a campus visit should continue to be emphasized to prospective students. Further the value of a personal conversation with a faculty member should continue to be stressed to university faculty as well as administrators. All university stakeholders must continue to recall they are not only recruiting students, but parents as well. Finally one-fourth of all participants in this study were first generation college students and approximately one half were former FFA or 4-H members and attended college within two hours of home. Recruitment efforts should continue toward these audiences as well as opportunities should be explored that might better recruit students not fitting these demographic characteristics.

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Research Poster

Perceptions of Online Swine Auction Websites: A Qualitative Study

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Perceptions of Online Swine Auction Websites: A Qualitative Study

Introduction/ Need for Research

The U.S. swine industry has increased in value from $18 billion in 2007 to $22.5 billion in 2012 (USDA, 2014). Hog and pig sales are evolving from face-to-face transactions to online auctions, where participants have access to multiple locations and various auction sites simultaneously (Himmerick, Kinzle, & Welch, 2011). Online swine auction websites must cater to many different people within the swine industry. A key challenge for e-commerce organizations is creating a website that attracts users, responds to their expectations, induces them to become regular visitors, and converts them into customers (Bayraktaroglu et al., 2009). Online swine auctions are still a fairly new market for livestock and little research has been completed on this subject, so it is uncertain if these websites are meeting the needs of their customers.

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. Individuals can be classified into the following adopter categories based on their innovativeness: innovator, early adopter, early majority, late majority or laggard (Rogers, 2003). This theory can be used to better understand how and why individuals utilize online resources such as ecommerce. Research concerning online shopping behaviors has attempted to understand the consumer's purchase and adoption behaviors. Recently, researchers have focused more on post adoption and repurchase behaviors of online customers to understand the link between customer satisfaction, complaint, and repurchase intention (Wu, 2013).

Purpose and Research Objectives

The study's purpose was to reveal the needs and concerns of online swine auction users. This insight would provide online swine auction companies with a better understanding of what they can do to make their sites more effective. This study was guided by the following objectives:

1. Determine the motives of buying and selling swine through online swine auctions.
2. Identify buyers' and sellers' concerns of using online swine auctions.
3. Ascertain the characteristics of online swine auction websites.

Methodology

The researcher used a descriptive, qualitative research design consisting of in-depth, semi-structured telephone interviews to produce findings derived from real-world situations where the phenomena of interest are revealed naturally (Patton, 2001). Semi-structured interviews provide the ability to explore perceptions and opinions of respondents regarding complex and sometimes sensitive issues by enabling probing and clarifications of answers (Louise-Barriball & While, 1994). To organize the data and observe any reoccurring themes, the transcribed interviews were reduced into categories of common themes. Through the use of axial coding, the researcher identified dominant emergent themes within the data. Axial coding is the process of making connections between and across categories in qualitative data analysis (Ary et al., 2010).

The target population consisted of 11 male users of online swine auction sites, all residing in the state of Texas. More than half (64%) visited online swine auction sites daily. The others (36%)

who said they visit these sites weekly or monthly stated that during peak buying season (September-November), they visit online swine auctions daily. Two participants had purchased swine online once; three said at least 10 times; and two participants had bought between 150-250 animals through an online auction site. One participant had sold once through an online auction site. Three participants identified themselves as spectators and have not bought or sold through an online swine auction.

Results/Findings

The results of the study indicate that the online swine auctions allowed participants to reach a market outside of their geographical region and examine swine prices across the nation. The participants weighed the option of buying through online auctions or traveling from place to place to make purchases. When making these decisions, time, economics, and distance were factors they considered. A general consensus participants had of the online swine auctions reflected a positive reaction toward the auctions, with a few exceptions. One participant stated: "I won't buy a pig from an online auction unless the seller sends me a video of the pig walking. I would like to see a short video added to the auctions because you show a pig walking, not standing still." Additional negative aspects the participants indicated were misrepresentation of the animal, delivery of the wrong animal, lack of bidder transparency, and high bidders' premium and sales commission. Credibility, online security, usability, and accessibility were all characteristics the participants expressed knowledge of or concern with when dealing with online swine auctions websites. In most cases, the ability to reach a wider variety of pigs outweighed the negative aspects they have faced with online swine auctions.

Conclusions

Although online swine auctions are now a decade old, the innovation-decision process is still in the early phases. All the participants had knowledge of and experience with online auctions, but not all had fully adopted this technology. The Wendt Group Inc. became the innovator within the swine industry online auctions in 2004 when it held the first online swine auction. Innovators are typically venturesome and the first to adopt an innovation (Rogers, 2003). The participants who have purchased or sold swine online represent the early adopters. They are considered to be the individuals to check with before adopting a new idea (Rogers, 2003). The three participants who identified themselves as spectators are the early majority individuals, who tend to deliberate on ideas more than the early adopters before making a move (Rogers, 2003). These individuals expressed concerns dealing with not having the self-confidence to make these purchases online or they are not technology savvy. No late majority or laggards were included in this study.

Implications/Recommendations/Impact on Profession

The findings of this study highlight concerns that buyers have with online swine auctions. Incorporating the buyers' suggestions to create a video feature, a feedback review system, and transparency could attract a larger market. It is recommended that future research of online swine auctions use quantitative methods to seek insight from a larger sample of respondents to provide a greater understanding of how this technology is being adopted and used in agriculture. The identified benefit of online auctions allowing access to animals without the geographic boundaries may have unintended consequences for local market auctions. With the growth of online auctions in the agriculture industry, knowing the impact these have on local market auctions will assist the producers in deciding which market will better fit their operation.

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Plant Science Graduate Students' Teaching Self-Efficacy to Engage K-12 Students

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Plant Science Graduate Students' Teaching Self-Efficacy to Engage K-12 Students

Introduction/Need for research

Graduate students' motivation to share their knowledge and research with K-12 audiences as future scientists is informed by their self-efficacy beliefs to teach science literacy through outreach and engagement activities. Previous studies on preparing graduate students for outreach and teaching experiences have focused the improved teaching and communication skills for graduate students (Calder, Brawley, & Bagley, 2003; Feldon et al., 2011; Grant, Liu, & Gardella, 2014; Laursen et al., 2012; McBride et al., 2011). Preparing future scientists to learn how to engage PK-12 students is important because of the societal responsibility to extend communication of their findings beyond research journals to policy makers and the general public (Smith et al., 2013). Graduate training programs in academia integrate outreach teaching components to equip future scientists with a variety of communication skills, which may reflect either a transmission of knowledge to the learner or through engagement with the learner. As such, the education component of the "Partnership for Research and Education in Plant Breeding and Genetics" grant sought to train graduate plant science students to disseminate their research to K-12 audiences. Graduate students participated in outreach teacher training using Learner-Centered Teaching (LCT) strategies to develop and conduct two science lessons for K-12 audiences in a non-formal and formal educational settings. The purpose of this mixed methods study was to describe the teaching self-efficacy beliefs of plant science graduate students before and after receiving outreach training on PK-12 engagement.

Theoretical Framework

Teaching self-efficacy is an individual's self-perceived capabilities in a teaching environment (Tschannen-Moran & Hoy, 2007). The process of learning to teach may initially happen by watching others teach (i.e., vicarious experience) or through by teaching others (i.e., mastery experiences). Self-efficacy in determined when graduate students reflect upon their experiences within an environment and their personal attributes to determine how confident they are in their abilities to teach in a specific context. Mastery experiences, verbal persuasion, vicarious experiences, and physiological arousal are the four major influences on teaching self-efficacy (Tschannen- Moran & Hoy, 2007). Teaching self-efficacy is a significant predictor of effective teaching practices (Goddard et al., 2004) and has been studied in the field of K-12 science (Bleicher, 2004) and higher education (DeChenne, Enochs, & Needham, 2012; Fives & Looney, 2009). Students were more motivated and performed at higher levels of achievement when teachers espoused higher levels of self-efficacy beliefs (Caprara, Barbaranelli, Steca, & Malone, 2006).

Methodology

This was a descriptive study that used mixed methods to determine graduate students' teaching self-efficacy beliefs. Quantitatively, a questionnaire was used to assess teaching self-efficacy before and after the outreach training experience. The 20 teaching self-efficacy items were adapted from "The Teachers' Sense of Efficacy Scale" developed by Tschannen-Moran and Hoy (2001). Participants responded to a five-point scale responses: (a) Not at all/none, (b) Very little, (c) Some, (d) Quite a bit, and (e) Always/a lot. The questionnaire was reviewed by a panel of experts to establish face and content validity. The reliability of the self-efficacy questionnaire was established by calculating the post-hoc Cronbach's alpha coefficient for 20 items ($\alpha = 0.90$). Fifteen graduate students completed the questionnaire (13 doctoral & 2 master's; 9 female & 6 male). Means and standard deviations were calculated and reported. Qualitatively, descriptive coding, *in vivo* coding, and provisional coding strategies were used to summarize content of students' reflections of their nonformal and formal education teaching experiences. Provisional coding "corroborates or builds upon previous research or investigations" (Saldaña, 2013, p. 144). Strategies for auditability, objectivity and authenticity were followed (Miles et al., 2014). Trustworthiness of this study was guided by protocol in credibility, transferability, dependability, and confirmability (Denzin & Lincoln, 2011). Triangulation of data from multiple sources was utilized to establish credibility (Patton, 2002).

Results/Findings

Teaching self-efficacy scores at the beginning of the experience depicted graduate students as overall feeling "somewhat" self-efficacious with teaching with an overall mean of 3.58 (SD = .38). Graduate students rated themselves as "quite a bit" teaching self-efficacious on 50% of the items. Teaching self-efficacy scores of graduate students from the follow-up questionnaire depicted graduate students felt "Quite a Bit" self-efficacious with teaching with an overall mean of 3.98 ($SD = .28$). The follow-up teaching self-efficacy scores had a large effect size (d = 1.19) from the initial graduate students' teaching self-efficacy scores. This difference is descriptive and cannot be interpreted as a cause-effect relationship. Graduate students rated themselves with predominately "quite a bit" of teaching self-efficacy on 80% of the items. Qualitatively, a total of nine of the 15 graduate students expressed teaching self-efficacy related comments after teaching in the nonformal educational settings. Overall, graduate students generally described their perceptions of their abilities to assist student learning with K-12 audiences through reflective comments relating to communication skills and techniques, and they described two self-perceived teaching environmental challenges. First, it was challenging for graduate students to adjust their novice teaching behaviors according to the quick pace for non-formal instruction. Second, it was challenging to link research concepts to a quick presumption of the audience's science knowledge. Regarding the formal K-12 teaching experiences, 15 graduate students expressed comments related to concepts within the teaching self-efficacy criteria. Graduate students described their development of teaching self-efficacy with a perceived ability to engage the K-12 students through their plant science lessons. Graduate students shared they felt self-efficacious based on their observations that K-12 students could readily understand and apply plant science knowledge during their lessons.

Conclusions, Implications and Recommendations

Graduate students described field-based teaching experiences within formal and non-formal educational settings that helped them practice communication skills and develop their teaching self-efficacy. This conclusion supports the assumption that mastery experiences are valuable to build teaching self-efficacy (Shunk, 2008; Tschannen- Moran & Hoy, 2007). As graduate-level academic programs continue to adjust and adapt to prepare plant science graduate students to effectively communicate to society, the following implications are imperative: acquiring (LCT) teaching skills to communicate science literacy (Feldon et al., 2011), benefits of K-12 audience field-based experiences (Laursen et al., 2012), the opportunity to use a constructivist approach to assist learners in facilitating science outreach and implications for policy (Smith et al., 2013). Future studies should expand to other disciplines and more students to increase generalizability. Further studies should focus on key elements of a limited formal teaching experiences regarding a graduate students' development.

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Predicting Manuscript Acceptance through Reviewers' Ratings on Evaluation Criteria: An Analysis of Manuscript Reviews for the National Agricultural Education Research Conference

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Predicting Manuscript Acceptance through Reviewers' Ratings on Evaluation Criteria: An Analysis of Manuscript Reviews for the National Agricultural Education Research Conference

Introduction

The value of conference presentations as a means of disseminating one's research, increasing the impact of that research, and ultimately succeeding in the tenure and promotion processes has long been established in agricultural education (Birkenholz & Simonsen, 2011). However, the peer-review process through which papers are selected fro presentation has been met with skepticism, primarily due to the perceived lack of agreement between reviewers regarding manuscript quality (Bornmann, Weymuth, & Daniel, 2010; Hodgson, 1997). The agricultural education profession's commitment to providing "accurate and reliable data that describes the quality and impact of…outreach efforts at all levels…to respective decision groups" (Doerfert, 2011, p. 10) warrants an analysis of the relationship between manuscript scores on individual manuscript review criteria and a reviewer's decision to accept or reject a manuscript.

Conceptual Framework

Criteria on which manuscripts are typically evaluated include "selecting the appropriate research design to answer the question of interest, providing a strong theoretical rationale for the research hypotheses, using the correct analyses, correctly interpreting the results, using clear writing in the manuscript, and following required formatting within the manuscript" (Albers, Floyd, Fuhrmann, & Martinez, 2011, p. 670). The lack of current research investigating the relationship between criteria and manuscript acceptance suggests that "the peer-review process is an unclear and mysterious process to many prospective authors who frequently are unclear as to what characteristics make a manuscript likely to be evaluated positively by editors and reviewers. Such a mismatch between what is thought to be important by authors and what is actually considered to be important by editors and reviewers suggests that these discrepancies should be investigated and then explained" (Albers, et al., 2011, p. 671).

Methods

The purpose of this study was to evaluate the use of specific review criteria on manuscripts submitted for presentation at the 2014 National Agricultural Education Research Conference. Specific objectives were to 1) describe reviewers' mean manuscript evaluation scores for each evaluation criterion; 2) describe the relationship between reviewers' evaluation scores for each evaluation criterion and their total score given to a manuscript; 3) describe the relationship between reviewers' evaluation scores for each evaluation criterion and their decision to accept or reject a manuscript; and 4) determine the relative importance of each variable in predicting recommendations to accept or reject the manuscript.

After institutional IRB approval and approval by the AAAE Research Committee, the lead researcher was provided with access to the Fast Track® manuscript review files for each of the 112 manuscripts submitted for the 2014 NAERC. Each manuscript had been reviewed by three peer reviewers for a total of 336 reviews. Review data were manually entered into an Excel spreadsheet; to ensure reviewer anonymity, no reviewer identification information was included in the data set. All data were verified and imported into SAS (Version 9.3) for data analysis.

Findings

Manuscript reviews scored in accordance with the official review rubric should yield valid scores ranging from 7 to 69, with higher scores indicating higher quality papers. For the 2014 NAERC, the mean manuscript evaluation score was 50.24 (*SD* = 11.47). The scores were negatively skewed (skewness = -0.78) and ranged from 1 to 71 (due to scoring errors). As a percentage of the evaluation rubric points possible, the manuscripts had a mean rating of 72.82% and were rated highest on writing quality (80.30%) and lowest on conclusions and recommendations (67.33%).

There were significant ($p < .001$) moderate to very strong (Davis, 1971) positive correlations between each citerion score and the total manuscript score. Correlations between the criterion scores and the total score ranged from .45 (writing quality) to .85 (conclusions and recommendations). Review of squared semi-partial correlations showed that methods explained the largest proportion of unique variance in total score (r_s^2 = .0440), followed by conclusions and recommendations (r_s^2 = .0382), theoretical framework (r_s^2 = .0233), results (r_s^2 = .0154), purpose and objectives (r_s^2 = .0080), writing (r_s^2 = .0067) and introduction (r_s^2 = .0047).

There was a significant ($p < .0001$) and very strong (Davis, 1971) positive correlation ($r = .77$) between reviewers' total evaluation scores and their level of agreement that manuscripts should be accepted for presentation (rated on a 1 - 6 scale where 1 = strongly disagree and 6 = strongly agree). Likewise, there were significant ($p < .0001$) moderate to very strong (Davis, 1971) positive correlations between reviewers' ratings of the introduction ($r = .56$), theoretical framework ($r = .51$), purpose and objectives ($r = .49$), methods ($r =.62$), results ($r = .62$), conclusions and recommendations ($r = .73$), and writing quality ($r = .38$) and their level of agreement that the manuscript should be presented.

Beta weights and squared semi-partial correlation coefficients were reviewed to assess the relative and unique importance of each manuscript component score in predicting acceptance recommendations. All predictors except for scores on the theoretical framework and purpose and objectives sections made statistically significant contributions to predicting manuscript acceptance recommendations. Standardized regression coefficients and the squared semi-partial correlation coefficients were consistent in identifying the relative importance of each significant variable in predicting acceptance recommendations. Scores on the conclusions and recommendations section (r_s^2 = .0752) explained the largest percentage of unique variance in acceptance recommendations, followed by methods ($r_s^2 = .0214$), relevance ($r_s^2 = .0172$), writing quality ($r_s^2 = .0138$), introduction and need for the study ($r_s^2 = .0090$), and results ($r_s^2 = .0048$).

Conclusions & Recommendations

Agricultural educators tend to be pragmatic and results-oriented (Miller, 2006) and disciplinary research tends to focuses on meaning, ends, and ways and means (Copa, 1984). Given this orientation, there is little wonder that reviewers place the most importance on conclusions and recommendations (ends), methods (ways and means), and relevance (meaning) when deciding which manuscripts to accept for NAERC presentation. Researchers can maximize their likelihood of acceptance at NAERC by conducting methodologically sound studies on relevant problems likely to yield practical recommendations for improved professional practice.

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Professional Development Needs of School-Based Agricultural Education Teachers

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Professional Development Needs of School-Based Agricultural Education Teachers

Introduction/Need for Research

In order to maintain professional competence, all teachers must continuously learn throughout their careers (Estepp, Thoron, Roberts, & Dyer, 2014). Similarly, Sorenson, Tarpley, and Warnick (2010) indicated school-based agricultural education teachers require some form of regular professional development to help them cope with the rising demands of their profession. Professional development opportunities are designed and implemented to increase teacher learning, which can result in furthering student achievement (Shoulders & Myers, 2014). Furthermore, Shoulders and Meyers (2014) concluded that when professional development activities include the following core features: (a) focus on content, (b) coherence, (c) sufficient duration and (d) collective participation, teachers benefited more from these activities than solely from active learning. The purpose of this study was to explore the professional development needs of agriculture teachers in [State] since no prior research was found on this specific population.

Conceptual Framework

The Borich needs assessment model (1980) was the conceptual framework used for this study because it allowed professional development needs to be prioritized and ranked. The Borich model allowed researchers to utilize competencies, skills, and knowledge in the form of statements in order for teachers to individually assess the relevancy and their perceived levels of ability for each statement. The Borich model (1980) has a history of being used to determine the professional development needs of school-based agriculture teachers (Barrick & Doerfert, 1989; Edwards & Briers, 1999; Layfield & Dobbins, 2002; Sorensen et al., 2010).

Methodology

This study was approved by [University]'s Institutional Review Board and had a target population of all school-based agricultural education teachers (N = 330) in [State]. Data were collected during the spring of 2013 using the Qualtrics online survey platform. Dillman, Smyth, and Christian's (2009) web survey implementation procedures guided the multiple contacts made. Thus, six emails were sent to the entire target population by the researchers: (a) prenotice, (b) email with a link to the survey, (c) three reminder emails with a link to the survey, and a (d) final email with a link to the survey announcing the end of the study. One hundred eight teachers completed the survey and 12 declined to participate. Following this data collection period, the researchers also presented the opportunity to participate in this study to the agricultural education teachers during the FFA summer camp and the summer professional development conference. These efforts yielded 19 additional responses. Therefore, data were collected from 127 teachers or 38.5% of the target population. No differences were found between early and late respondents. The survey used in this study was a modified version of Estepp, Thoron, Roberts, and Dyer's (2014) professional development survey. Face and content validity were verified by an expert panel consisting of seven agricultural education professionals. The final survey consisted of 85 items. Seventy-five of the items are the focus of this study and asked the teachers to provide their perceived levels of knowledge and relevance on competencies related to school-based agricultural education in [State] using a 5-point rating scale (1 = *low knowledge* or *relevance* and 5 = *high knowledge* or *relevance*). Post-hoc reliability was assessed for the aforementioned items using Cronhach's alpha (α = .97). Data were analyzed using IBM SPSS version 20. Mean weighted discrepancy scores (MWDS; Borich, 1980) were used to describe the professional development data.

Results/Findings

The top five rated professional development items were (a) *utilizing the common core in agricultural instruction* (MWDS = 4.20), (b) *teaching critical thinking skills* (MWDS = 3.92), (c) *managing stress* (MWDS = 3.76), (d) *balancing work and personal life* (MWDS = 3.64), and (e) *teaching problem solving skills* (MWDS = 3.56). The professional development items MWDS ranged from -1.11 to 4.20.

Table 1
Mean Weighted Discrepancy Scores for Top Five Professional Development Items

	Knowledge		Relevance		
Item	*M*	*SD*	*M*	*SD*	*MWDS*
Utilizing the common core in agricultural instruction	2.82	1.20	3.87	1.12	4.20
Teaching critical thinking skills	3.70	0.89	4.53	0.65	3.92
Managing stress	3.49	1.01	4.37	0.86	3.76
Balancing work and personal life	3.29	1.10	4.38	0.82	3.64
Teaching problem solving skills	3.77	0.92	4.52	0.68	3.56

Conclusions

The findings of this study concluded agricultural education teachers in [State] are in need of various types of professional development. [State] is a race to the top state, and the pressure to incorporate the common core standards may explain why utilizing the common core was the number one professional development need. In addition, being a race to the top state may partially explain the need for professional development in teaching critical thinking and problem solving skills. Authors of the common core standards claim the standards promote higher-order thinking skills (Common Core State Standards Initiative, 2014). Furthermore, the applied nature of agriculture may also partially explain the need for professional development in teaching critical thinking and problem solving. In regard to managing stress and balancing work and personal life, numerous factors such as extended contracts, implementing the total program (FFA, SAE, and instruction), new educational initiatives, and deficiencies in content or pedagogical knowledge may be contributing to this need.

Implications and Recommendations

We recommend professional development be developed and offered related to the common core, critical thinking, and problem solving. In regard to managing stress and balancing work and personal life, future research should investigate this matter in [State] and determine the most appropriate means for reducing stress and work and personal life conflicts. Moreover, this study should be replicated periodically, so professional development can be designed and implemented related to new or reoccurring needs. These recommendations should positively impact student success, since understanding teachers' needs are linked to student achievement (Shoulders & Meyers, 2014).

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Poster Type: Research

Reflections on the Integration of a School Garden into the Pre-K Curriculum

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Reflections on the Integration of a School Garden into the Pre-K Curriculum

Introduction/Need for Research

Priority 1 of the *National Research Agenda of the American Association for Agricultural Education* encourages exploring the "impact of agricultural literacy efforts on a variety of stakeholder behaviors" (Doerfert, 2011, p. 8). Increasing the agricultural literacy of the general public has been a topic of interest and research for many years. "Agriculture is too important a topic to be taught only to a relatively small percentage of students considering careers in agriculture and pursuing a vocational agriculture studies" (National Council for Agricultural Education, 1988, p. 1). School gardens could be used to improve agricultural literacy of students and teachers. "As commitment to gardening as a teaching tool develops, pre-service and in-service teachers need the educational tools to effectively implement a garden-based curriculum (DeMarco, Relf, & McDaniel, 1999, p. 280)." The educational tools include the "interdisciplinary use of gardening, basic horticultural knowledge, and school gardening models for local adaptation" (DeMarco et al., 1999, p. 280).

Theoretical/Conceptual Framework

The Social Cognitive Theory (Bandura, 1986) was used as the theoretical framework for this research study. This theory focuses on changing behaviors based on three factors: personal, behavioral, and environmental. For purposes of this study the personal factors held by the teachers include beliefs, values, and prior knowledge. Behavioral items include skills needed to integrate the school garden into their existing curriculum. The environmental aspects include influences and surroundings which is the school garden and support from administration and researchers. Education programs influenced by this theory take under consideration that all the factors are interrelated and each must be considered in order for there to be behavior change (Morris, Briggs, & Zidenberg-Cherr, 2000).

Methodology

The purpose of this study was to explore the successes and challenges of a gardening program integrated into the Pre-K classrooms at a child development center. The following research objectives guided the study:

1. Explore teachers views toward integration of agricultural components associated with a school garden.
2. Describe the successes of the school garden as a teaching tool.
3. Identify the challenges of utilizing the school garden as a teaching tool.

Focus group interviews were used as the primary method for data collection. Focus group interviews rely upon group interaction for the planning of new programs and evaluating programs already in place (Glesne, 2006; Krueger, 1994). The interactive feature of focus groups allows for more thorough and dynamic discussion of issues and ideas (Krueger, 1994). The focus group conversations were audio-recorded and then later transcribed verbatim. Efforts to ensure trustworthiness were achieved through an audit trail, purposive sampling, and peer debriefing.

Results

The participants of this study consisted of the [school] director, two pre-K teachers, and two student assistants at [school]. They were given 7 months to implement a gardening program into their curriculum. While still conducting the program, the teachers were interviewed to obtain their opinions of the program's successes and challenges.

Research objective one explored teachers views toward integration of agricultural components associated with a school garden. Several of the participants grew up helping parents and grandparents garden. Currently, none of the participants actively garden in their free time, but were enthusiastic with the possibilities of this school garden.

Research objective two described the successes of the school garden as a teaching tool. The teachers agreed many aspects of the gardening program worked well. The children were able to see first-hand what was being taught in the classroom, such as naming vegetables, fruits, and the water cycle. Plants were used as experiments inside the classroom and the children were able to go outside each day to the garden. The children learned about insects and animals that might affect a garden, as well as life lessons such as how to share and take turns. The teachers agreed that the garden seemed to have an influence on the children's eating habits by increasing their motivation to eat fruits and vegetables.

Research objective three identified the challenges of utilizing the school garden as a teaching tool. The teachers were adamant about not having an efficient watering system, little to no parental participation, and suitable protection against common garden pests and animals. They indicated the amount of garden produce was insufficient to ensure every child a sample to try. The teachers admitted to having inadequate knowledge of basic gardening to be thorough in their lessons and lacked communication about what was actually being grown in the garden.

Conclusions and Implications

The focus group illuminated the prior knowledge held by the teachers and staff as well as the perceived successes and failures with integrating the garden into existing curriculum. For teachers "to make the commitment of time and energy to school gardening, he or she must recognize and believe that gardening is a valuable teaching tool that will enhance the education of the students" (DeMarco et al., 1999, p. 280). Participants communicated positive views toward the garden, but needed more assistance to take full advantage of the school garden. The successes and challenges identified by the participants should be considered to improve the project. Education programs influenced by the Social Cognitive Theory (Bandura, 1986) take under consideration that all the factors are interrelated and each must be considered in order for there to be behavior change (Morris, Briggs, & Zidenberg-Cherr, 2000). More efforts should be made to address all three factors in an effort to improve agricultural literacy.

Recommendations

The findings from this focus group can be used to make improvements to existing school gardens and help plan future gardens targeting pre-K aged children. Additional training of the [school] staff is an essential component in order to help improve their ability to utilize the garden in the existing curriculum (Dobbs et al., 1998). Teaching materials such as; lesson plans, activity ideas, posters, and videos, should be designed to help teachers better integrate the school garden into their existing curriculum (Dobbs et al., 1998). Support in designing and caring for the garden is also critical for the effective implementation of learning opportunities.

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Research Poster

School Culture Influences on Beginning Agriculture Teachers' Satisfaction and Efficacy

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School Culture Influences on Beginning Agriculture Teachers' Satisfaction and Efficacy

Introduction

Since 1990, agriculture teacher attrition rates have been on the rise (Kantrovich, 2007). School culture has been regularly studied as a component of the attrition issue. Boyd (1992) identified school culture as interplay between three factors: attitudes and beliefs of persons inside the school and external environment, the cultural norms of the school, and the relationships between persons within the school. School culture affects every member in the school building, including teachers (Boyd, 1992). Agricultural education has a unique setting in each school and therefore unique needs. Therefore, if agriculture teachers do not feel included or connected with school culture, it may add to the high attrition rate in agricultural education. With this in mind, the researchers sought to understand the role that school culture plays in decisions new teachers make in persisting in the profession.

Conceptual Framework

After a thorough review of literature, a substantive theory was developed highlighting the importance of administrative, colleague, and parental supports, as well as teacher self-efficacy and job satisfaction in decisions related to teaching persistence. Administrative support impacts both a teacher's sense of self-worth and longevity in the classroom (Brunetti, 2006; Gu & Day 2007), whereas lack of it has been identified as a common problem (Boone & Boone, 2007) and cause of attrition (Walker, Garton, & Kitchel, 2004). Positive relationships between colleagues play a role in motivating teachers (Brunetti, 2006; Gu & Day, 2007). However, agriculture teachers who work with unmotivated peers have experienced increased stress (Torres, Lawver, & Lambert, 2008). Parent-related issues have been a concern and stressor for young teachers (Tait, 2008). Mundt & Connors (1999) noted that building community and parental support was one of the biggest challenges identified by NAAE Outstanding Young Members. Teachers who have a high teacher self-efficacy, or feel competent to complete their classroom duties, have been shown to have a high degree of job satisfaction (Blackburn & Robinson, 2008).

Purpose and Objectives

The purpose of this study is to examine the relationship of how the combination of district and school administrative, colleague, and parental support explained levels of teacher self-efficacy and job satisfaction in early career teachers. The specific study objectives were: 1. Describe perceived levels of district and school administrative, colleague, and parental support, teacher self-efficacy, and job satisfaction; 2. Determine if a model exists explaining a significant proportion of the variance in teacher self-efficacy as explained by perceived administrative, colleague, and parental support; 3. Determine if a model exists explaining a significant proportion of the variance in teacher job satisfaction as explained by perceived administrative, colleague, and parental support.

Methodology

A relational survey was administered to first and second year agriculture teachers in Kentucky, Missouri, and Wisconsin. A list of participants was obtained from state staff. The researchers developed a questionnaire to measure school and parental support consisting of four constructs of 5-point Likert scale items and submitted it to a panel of experts (N = 5) to determine face and content validity. Reliability scores were calculated using third to fifth year teachers and alpha scores for all constructs ranged from 0.85-0.90. A single 7-point Likert scale item was used to determine teacher job satisfaction, which has shown to be as reliable as constructs (Kitchel, et al., 2012). Teacher self-efficacy was determined by using the Ohio State Teacher Self-efficacy Scale. Data were collected using an online Qualtrics survey and were analyzed through SPSS.

Results

For objective 1, descriptive statistics were calculated to describe perceived levels of administrative, colleague, and parental support, teacher self-efficacy, and job satisfaction. On a scale of 1-5 with 1 = Strongly Disagree and 5 = Strongly Agree, the mean score for district administrative support was 3.67 (*SD* = 1.02); school administrative support was 4.08 (*SD* = 1.09); colleague support was 3.98 (*SD* = 1.01); parental support was 3.82 (*SD* = 0.90). On a scale of 1-6 with 1 = Strongly Disagree and 6 = Strongly Agree, teachers indicated their levels of teacher self-efficacy as 3.94 (*SD* = 0.40). On a scale of 1-7 with 1 = Strongly Dissatisfied and 7 = Strongly Satisfied, teachers rated their job satisfaction as 4.86 (*SD* = 1.42).

For objective 2, a stepwise multiple regression was calculated to determine if a model exists explaining a significant portion of variability among novice teachers' teacher self-efficacy as measured by their perceived levels of administrative, colleague, and parental support. The analysis resulted in a statistically significant model, which included only the perceived district administrator support construct explaining 8.8% of the variance. Of all the support constructs, the district administrator construct was the only one to significantly explain a portion of the variance. All other constructs were excluded from the analysis via the stepwise multiple regression procedures.

Objective 3 sought to determine if a model existed explaining a significant proportion of the variance in beginning teachers' job-satisfaction and the perceived levels of support from district and school administrators, colleagues, and parents. A stepwise multiple regression was calculated to determine the relationship. The analysis resulted in a statistically significant model including school administration, colleagues, and parents' perceived support accounting for 60.2% of the variance in young teachers' job satisfaction. School administrators had the most unique impact, 48.6%, while colleagues had 9.0%, and parental support comprised 2.6% of the variance. District administrators was removed via the stepwise multiple regression procedures.

Conclusions/Implications/Recommendations

In general, novice teachers have positive perceptions of the support they receive from within the school and district. Based on these results, district-level administration has the largest influence on teacher self-efficacy. In future research, it is recommended to explore this relationship and determine how district administrators influence novice teachers.

Over half of the variance related to teacher job satisfaction can be directly linked to perceived levels of school support, from both school-level administration and colleagues, which is consistent with prior research (Boone & Boone, 2007; Brunetti, 2006; Gu & Day 2007). These perceived aspects of school culture affect job satisfaction, which in turn affects levels of attrition in agriculture programs. In future research, it is recommended to increase the sample size to include more teachers in more states to provide a clearer picture of agriculture education in general.

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Research

Semiotic analysis of agriscience educators and agricultural teacher candidates’ perceptions of global competency gains during an immersion experience

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Semiotic analysis of agriscience educators and agricultural teacher candidates' perceptions of global competency gains during an immersion experience

Introduction

School-based agricultural education can play a key role in "globalizing" the next generation of agriculture professionals. For decades the agricultural education profession has discussed and conducted research on the topic of internationalizing or globalizing the secondary school agricultural education programs (Ibezim & McCracken, 1994; Harbstreit & Weldon, 1992; Peuse & Swanson, 1981). Increasing the global competency of teachers and teacher candidates should bring topics related to global agriculture into the classroom, increase opportunities for global engagement, and develop empathy for students from varied backgrounds (Foster, Rice, Foster & Barrick, 2014).

Theoretical Foundation

Mezirow's transformational learning theory which is the "process of exploring, assessing, and working to change limiting frames of reference and habits of mind" served as the theoretical foundation for the study (Mezirow, 2000). Transformative learning is focused on the kind of learning that facilitates a deeper reflection and critical consciousness in an individual. Mezirow's (1991) theory is about how adults make meaning from and interpret their experiences. He defined a perspective transformation as:

> The process of becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand, and feel about our world; changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrative perspective; and finally, making choices or otherwise acting upon these new understandings (p. 167).

Methods

The purpose of the descriptive study is to explore the effect of an immersion experience on perceptions of knowledge, skills and dispositions gained by participants through semiotic analysis of photographs submitted by participants. The research objective that guided the study was to identify participant perceptions of knowledge, skills, and dispositions related to global competency were acquired through an immersion experience. The population in this study included 15 students enrolled in a class consisting of seven agricultural education majors enrolled at a University and eight current agricultural education teachers from various locations. Participants were expected to attend ten class sessions prior to the trip in preparation for a one month abroad experience in the Republic of Korea from June 14 - July 12, 2014. Students submitted three pictures each at the end of the trip while still in Korea accompanied by 3-5 word descriptors per photograph. Each participant submitted a picture representing knowledge gained, another picture for a skill gained, and a photo for a disposition gained. A focus group was conducted so participants could share and discuss the knowledge, skills, and dispositions they gained during the abroad experience. An audio recording was used to capture the discussion and later transcribed for data analysis.

Findings

The qualitative data retrieved during this study is taken directly from participants' focus group discussion. Fifteen participants identified three themes for knowledge, six themes for skills, and five themes for dispositions. Participants continuously stressed the importance of the experience to develop their global competency that simply learning would not suffice. Eight of the fifteen participants discussed knowledge gained relating to agricultural production differences between Korea and the US. Five of the participants used facts about Korea's education system to share knowledge they acquired on this experience during the focus group and the last participant shared knowledge related to Seoul's transportation system. There were six major themes that occurred regarding photographs depicting skills by the fifteen participants. Seven participants submitted photographs related to learning the Korean language, three submissions involved communication, two submissions related to collaboration, and the last three participants had photographs related to agricultural production, skills involving use of chopsticks, and coaching students. Eight of the fifteen participants submitted photographs and expressed their opinions on their dispositions regarding other cultures. Participants were subjected to cultural knowledge prior to the experience, but the cultural immersion allowed participants to experience the culture and recognize the validity of prior knowledge.

Conclusions

Participants in this study showed evidence of developing global competency through self-identified knowledge, skills, and dispositions as evidenced by selected photographs. Purposeful and critical reflection (Dewey, 1933; Montrose, 2002) on the transformative learning experience (Mezirow, 2000) experience allows for a "meaningful understanding of other cultures as well as one's place in an interconnected world" (Cushner, 2007, p. 37). An additional conclusion from the focus group findings is that while some knowledge can be obtained from globalizing or internationalizing curriculum delivered on home campuses, there is a certain level of knowledge that can only be obtained from full immersion. Participants can learn in any location, but the experience allows learners to delve deeper into the topic providing more information than what might be potentially sought out or found as individuals. Semiotic analyses assisted in determine the depiction of global competency by agricultural educators. Photograph submissions by participants depicted their development of global competency in their experiences in Korea assisting in fulfilling the priorities of the National Research Agenda for "Meaningful Engaged Learning (Doerfort, 2011), thus assisting the United States in achieving its goals of successfully preparing student to engage in global challenges providing for a strong global economy (USDE, 2012).

Recommendations

For future research, faculty perspective of participant development and host country partners' perspectives of the experience could provide interesting insights as this study exclusively utilized a population of students. Future research should also be conducted to attempt a cost benefit analysis of global competency gains between immersion experience and on-campus internalization of course work, specifically analysis of the greatest gains at the most efficient investment of fiscal resources for three different populations: secondary students, post-secondary students, and in-service agriscience educators. Finally, it is recommended that the semiotic analysis method potentially be utilized as a method to explore other issues in school-based agricultural education, from transformative learning experiences like student teaching internships to perceptions of what school-based agricultural education is from key stakeholder groups like administrations, fellow teachers, agriscience educators, students and community members.

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Research

Student Perceptions of their Experience in a Flipped Undergraduate Capstone Course

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Student Perceptions of their Experience in a Flipped Undergraduate Capstone Course

Introduction

Flipped learning is a relatively new method being used in higher education which has been shown to promote increased student engagement and motivation (Tucker, 2012). Flipped learning utilizes a restructuring of content delivery methods (lectures, presentations, & readings) traditionally delivered in face-to-face settings by requiring student completion prior to class (Rosenberg, 2013; Tucker, 2012). Doerfert (2011) posits that meaningful and engaged learning in all environments is essential for the success of 21st century learners.

Team Based Learning is a teaching method which integrates a flipped approach and relies heavily on the use of small groups with the purpose of transforming them into high performance learning teams (Michaelsen, Knight, & Fink, 2004). Neider, Parmalee, Stolfi, and Hudes (2005) posited that TBL is a very active type of learning process that aids students in acquiring factual materials as well as in developing higher-level cognitive skills. The aforementioned benefits are initiated by implementing strategies to ensure student accountability for content delivered in a flipped scenario. The five step Readiness Assurance Process (RAP) is integrated within TBL and includes; a) pre-class preparation, b) individual assessment, c) team assessment, d) appeals, and e) oral feedback (Michaelsen et al., 2004). Pre-class preparation includes viewing online lectures or presentations, and reading reference materials prior to participating in the face-to-face class time. Students are assessed individually over the pre-class content, and again as a team immediately after the individual test. Michaelsen et al. (2004) observed robust student conversation during implementation of the team test which served as a natural segue into application exercises where students apply the newly acquired content toward complex, real-world problems or situations (Michaelsen et al., 2004).

AgEdS 450, Farm Management and Operations at Iowa State University (ISU) provides students with a capstone experience in the management and operation of a real, working farm (Murray, 1945). The tenants of a capstone course as outlined by Crunkilton, Cepica, and Fluker (1997) are followed and include an emphasis on teamwork, communication, decision-making, problem-solving, and critical thinking. Students are tasked with making decisions relevant to a working farm (i.e., seed selection, fertilizer plans, building and safety audits) (McCubbins, 2014). In order to meet the needs of a diverse student population and further attempts to promote active learning, TBL was implemented into AgEdS 450 in the fall of 2014. In order to assess student satisfaction of the flipped Farm Management and Operations course at ISU, the purpose of this study was to determine student perceptions of the effectiveness of TBL.

Theoretical Framework

Mezirow's transformative learning theory served as the theoretical framework for this study. Transformative learning theory is defined as "the process of effecting change in a frame of reference" (Mezirow, 1997, p. 5). Mezirow further stated that for learning to be meaningful, new information acquired by learners should be incorporated into "an already well-developed symbolic frame of reference, an active process involving thought, feelings, and disposition" (p. 10). Learners draw from and build upon previous experiences in a transformative learning experience. In order to foster learner self-direction, the educator becomes the facilitator, and emphasizes problem-solving groups in which students learn from one another (Mezirow, 1997).

Methods

As part of a larger study, student perceptions of TBL in a capstone course were sought. An electronic questionnaire developed by Bickelhaupt and Dorius (2014) was distributed to all students enrolled in AgEdS 450 for the fall of 2014 (*N* = 57). Three constructs guided the survey and included; 1) beliefs and attitudes about learning, 2) motivation to learn, and 3) professional development. The instrument contained four sections consisting of; 14 Likert-scaled questions relating to student experiences in a TBL formatted course, 21 Likert-scaled questions relating to student beliefs about TBL, and two open-ended questions for feedback on the course structure. The fourth section included four demographic questions requesting age, transfer status, GPA, and gender. Content and face validity was established by a panel of experts in survey design and TBL. The instrument was tested (*n* = 397) in other TBL courses at ISU to measure reliability. Following the suggestions of Urdan (2012), the pilot study resulted in construct reliability coefficients deemed acceptable (α = 0.84 – 0.92). Usable instruments in the present study were collected from respondents (*n* = 48) for an 84.2% response rate. This study is limited to the respondents who participated, as their perceptions are specific to a homogenous sample in a capstone course at ISU. However, results may provide insight to those interested in utilizing TBL in capstone courses at other institutions.

Results

Student perceptions regarding the course and each construct were overwhelmingly positive. Data from Table 1 identifies the highest rated items regarding student experiences in the TBL capstone farm management course.

Table 1

Student Perceptions of Selected Experiences in a TBL Formatted Course (N=57)

		SA/ A	N	D/ SD
	n	*f*(%)	*f*(%)	*f*(%)
During this course, my team and I have worked well together.	48	46(95.8)	1(2.1)	1(2.1)
Solving problems in a group was an effective way to apply what I have learned.	47	41(87.3)	5(10.6)	1(2.1)
Being part of a team discussion has improved my ability to think through a problem.	46	39(84.8)	3(6.5)	4(8.7)
I was given the appropriate resources to do well in this course.	47	37(78.8)	3(6.4)	7(14.9)
I have found that being part of a team has helped to challenge previous ideas and improve my learning.	48	37(77.1)	5(10.4)	6(12.5)

Note. 14-Item Construct Grand Mean = 4.96. Construct SD = 1.03.
1 = Neutral, 2 = Strongly Disagree, 3 = Disagree, 4 = Neutral, 5 = Agree, and 6 = Strongly Agree

Conclusions/ Implications/ Recommendations

Based on the findings of this study, it can be concluded that student experiences in a TBL formatted course are overwhelmingly positive for AgEdS 450 at ISU. The process of flipping a course into TBL format is a time consuming process (Michaelsen, Sweet, & Parmalee, 2011), and student satisfaction is an important component in the continuous revision of AgEdS 450. These conclusions have implications for higher education as TBL may provide a more engaging learning environment for students (Michaelsen, Sweet, & Parmalee, 2011). Examining the effect of flipping other courses within Colleges of Agriculture to TBL would be beneficial as well.

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Teachers' Perceptions of Agriculture Dual Enrollment Courses

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Teachers' Perceptions of Agriculture Dual Enrollment Courses

Introduction

Currently there continues to be a shortage of qualified graduates for agriculture jobs within the United States (Goecker, et. al, 2010). One reason for this shortage could be contributed to the decline in student enrollment in colleges of agriculture and agriculture majors (Baker, Settle, Chiarelli, & Irani, 2013). An innovative program that can help students succeed and increase college preparation for future graduates is the agriculture dual enrollment program. Dual enrollment (sometimes referred to as concurrent enrollment) allows high school students to enroll dually in their normal high school class and a corresponding college course (Estación, et. al., 2011). Barnett and Hughes (2010) found that students who participate in dual enrollment enhance their chances for college admission. Participating in dual enrollment creates circumstances by which students are reluctant to give up the credits earned. These students are perhaps more likely to experience a sense of achievement in their initial college credit classes, and therefore enter post-secondary education without delay after high school to a greater degree than non-participants. Student participation in a dual enrollment program has also showed to have an impact on students' decision of a college major (Morrison, 2008), college persistence, enhancing self-confidence, and helping students see a connection between academic work and career success (Medvide & Blustein, 2010). Dual enrollment has been shown to benefit underrepresented and underachieving students, students who are enrolled in career and technology education programs (Bailey, Hughes & Karp, 2005), first generation students as well as both boys and girls (Karp et. al., 2007). This study addresses the National Research Agenda's Priority Area 5: Efficient and effective agricultural education programs (Doerfert, 2011). This agenda states "Agricultural education ha**s** the obligation to show that its curriculum can be used to meet the academic challenges of today's school system while preparing students for a career in the agricultural industry" (Doerfert, 2011, p. 26).

Conceptual Framework

This research was guided by the Concern-Based Adoption Model (CBAM) (Hall & Hord, 2006), a conceptual framework which describes, explains, and predicts probable teacher concerns and behaviors throughout a change process. In this case, the CBAM is applied to the change process of teachers implementing and enrolling in the agriculture dual enrollment program. It was originally based on research that showed that beginning teachers went through developmental stages and expressed predictable concerns at each stage as they learned to teach (Hall & Hord, 2001). The model was later adapted to measure concerns teachers expressed as they learned to use new practices and the extent to which they actually implemented the innovations.

Methods

This research employed a descriptive study with open-ended questions. The sample population for this study was all [STATE] teachers who were currently offering the agriculture dual enrollment courses on their high school campus (N = 34) out of the 90 teachers in the state. We received a response rate of 84% (n = 28). Comparison of early and late responders revealed no significant ($p < .05$) difference. The instrument used for this study was the Teacher Dual

Enrollment Impact Survey, developed by the National Association for Concurrent Enrollment Partnerships (NAECP, 2012). The reliability of the instrument resulted in a Cronbach's Alpha score of .957 post-hoc evaluation. Based on this information, the researcher felt the findings could be generalized to the population. Quantitative data was collected in relation to teacher's perceptions of the dual enrollment program.

Findings

Overall teachers agreed that the program had a positive impact on student success. Teachers felt the largest impact of the agriculture dual enrollment program on students' success was the learning of in-depth agriculture knowledge (*M=3.93, SD=0.98*), staying on campus to get college credit (*M==3.86, SD=1.46)*, and gaining an appreciation for the challenge of college courses (*M=3.79, SD=1.26)*. It was found that high school teachers perceived the agriculture dual enrollment program as a benefit to them personally. They felt that this program had the greatest impact on their ability to establish higher standards for student work (*M=3.89, SD=1.03)*, making their job more satisfying (*M=3.71, SD=1.08)* and by helping them to feel more connected to their discipline (*M=3.64, SD=1.03)*. The dual enrollment programs impact on school counselors was found to have the lowest average of all of the areas of impact. They "disagreed" that the agriculture dual enrollment program had an impact on the way counselors enrolled students in their classes (*M=2.61, SD=1.85)* or the way they presented college options to students over other areas *(M=2.39, SD=1.77)*. They felt the strongest impacts of the program were in the areas of enhanced prestige and reputation of the highs school campus (*M=3.61, SD=1.32)*. The program was shown to have a positive impact on courses being more rigorous (*M=3.57, SD=1.23)* and demonstrated to parents that their students were taking part in challenging school work *(M=3.57, SD=1.29)*.

Conclusions/Recommendations

While the findings should not be over generalized beyond the sample population, overall researchers found that overall teachers felt the agriculture dual enrollment program had a positive impact on students, teachers and the secondary campus as a whole. There was found to be an affirmative effect on the community's perception of the agriculture program and high school course rigor. These findings are comparable to previous research on the benefits of dual enrollment courses (Bailey & Karp, 2003; Barnett & Hughes, 2010). It is suggested that continued professional development should be offered focused on the training of new teachers and experienced teachers as they possibly enter the higher stages of the CBAM, which involve refocusing and the consideration of making major modifications in the use of the innovation. Research focused on the pedagogical approaches of these course offerings, both from the university instructor and the secondary agriculture science teacher's teaching methods will benefit the creation of high quality dual credit courses. It is suggested that researchers continue studying the benefit of students' participation in the dual enrollment program on college entrance and success in higher education. In order to develop a program that is available to a wide range of learners more research should be done to find how well these programs address student variances (attitude, learning style, autonomy, etc.).

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The Critical Need for Experiential Learning Programs in Animal Agriculture

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The Critical Need for Experiential Learning Programs in Animal Agriculture

Introduction

As recognized by the National Research Council (2009), changes in society and industries alike have created novel challenges for youth wishing to enter agricultural disciplines (Splan, Porr, & Broyles, 2009). Students are now faced with overcoming knowledge gaps with the industry (Dimitri, Effland, & Conkland, 2005), as well as complex challenges that will require an experienced and well-rounded workforce. Furthermore, agricultural industries are in a greater need of qualified employees as many current employees are quickly approaching retirement (NRC, 2009). In order to overcome these challenges and changing industry foci, students must possess a broad base of knowledge and skills (Splan, Porr, & Broyles, 2009). More specifically, the National Research Council (2009) posits that educational programs must help students gain transferable skills and critical thinking strategies in order to be successful (Estepp & Roberts, 2011).

The Equine Studies Program at the Middleburg Agricultural Research and Extension Center (MARE Center) was implemented in 2010 to provide students with an experiential learning opportunity in equine science. Students are expected to participate in all aspects of the equine industry while also completing upper level equine coursework and participating in undergraduate research opportunities. The program aims to better prepare students for careers in industry, academia, or the veterinary sciences by emphasizing hands on experiences, critical thinking abilities, and realistic problem solving. Although participants have consistently been surveyed about their experiences at the conclusion of each semester, the program had not yet undergone a more thorough evaluation to determine programmatic impacts.

Theoretical Framework

This study proposed adopting a modified version of Kolb's (1984) model of experiential learning, referred to as experiential education. This perspective begins with an understanding of Dewey's (1938) theory of experience, positing that learners in traditional settings lack quality experiences and the ability to build connections to prior knowledge. Dewey (1938) further emphasized that learning requires individuals to change during and as a result of their experiences (Ord & Leather, 2011; Schunk, 2012). To further expand upon Dewey's (1938) work, our updated perspective utilizes Kolb's (1984) key principles of experiential learning – concrete experiences, reflective observations, abstract conceptualizations, and active experimentation. Although the works of Dewey (1938) and Kolb (1984) are vital portions of this updated perspective, both fall short in neglecting to recognize the inevitable social interactions occurring in such a learning environment. By considering the social cognitive proposition that individuals learn by doing, sensing, and observing the actions of others (Bandura, 1986; Ormrod, 2008; Schunk, 2008), we can more appropriately consider student/administrator and student/peer interactions that may impact participant experiences in an experiential opportunity. By combining the key elements of experiential learning and social cognitive theory, this perspective uptimately aims to provide a more complete understanding of what experiential education can do for our students. This perspective not only recognizes the processes through which students gain hands-on experiences, but also lends an explanation as to how experiential education can provide students with heightened processing and observation capabilities, social competencies, and self-regulatory abilities.

Methodology

This study implemented qualitative methods to gain an in depth understanding of student experiences in this context. The researcher developed a priori propositions in order to align research questions with supporting literature, and corresponding interview questionnaires were developed to ensure consistency. During the fall of 2013, a recruitment email requesting participation was sent to everyone previously associated with the Middleburg Equine Science Program. This included any administrators and graduate students in addition to undergraduate program participants. 15 individual interviews were ultimately conducted via telephone for consistency. Interviews were digitally recorded and later transcribed into Microsoft Word ©, and transferred into Atlas TI © for coding and theme analysis.

Results

Seven primary themes emerged from the collected interview data:

1. Program resources allowed administrators to maintain a student centered learning environment.
2. Experiential learning opportunities allowed participants to apply knowledge in a real-world context.
3. Ongoing research projects provided additional experiential opportunities for program participants.
4. Relationships amongst administrators, graduate students, and peer cohorts influenced participant experiences in an immersive environment.
5. Programmatic design incorporates community involvement and consequently provided valuable networking opportunities for participating students.
6. Experiential aspects of programmatic design foster personal growth in participants.
7. Experiences in an experiential learning environment enhance participant understandings of career aspirations.

Recommendations for Practice

The findings of this study provide adequate evidence that student-centered experiential learning opportunities provide invaluable experiences for undergraduate students. The program presents a unique learning environment for students, and creates a myriad of opportunities for students to gain hands-on skills and apply classroom knowledge. Three key recommendations for practice were made based on study findings. First was the importance of recognizing the role of social interactions in educational environments. Although participants did report occasional struggles with social dynamics in the program, students unanimously agreed that these interactions were beneficial. Students not only learned from one another, but also gained personal skills from learning to live and work in such a close environment. Secondly, students appreciated the efforts made by program administrators to support a student-centered learning environment. Study findings indicated that this type of environment encouraged more meaningful and self-directed learning, as students were encouraged to identify areas of educational need and interests that were often incorporated into the program. Lastly, study findings emphasized the importance of consistently creating opportunities for applied knowledge. Although initially intimidating for some, students felt empowered upon realizing the connections between hands-on opportunities and knowledge. Many students also reported that the program's numerous opportunities for applied knowledge helped them make sense of their overall education.

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Poster Type: Research

The Exploration of Social Media as a Media Relations Tool For Agricultural Organizations

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The Exploration of Social Media as a Media Relations Tool for Agricultural Organizations

Introduction

Social media has become widely adopted among individuals, businesses, and organizations as a means of communication and has changed the manner in which information is sent and received (Varner, 2012). As one of the nation's most important industries, the agricultural industry has also adopted social media to communicate with consumers and the public (White, Meyers, Doerfert, & Irlbeck, 2014). Though there is a shift from print media to digital media, the traditional news media remains important to the agricultural industry because most individuals receive information about agriculture from sources such as newspapers and television.

As [State]s largest economic contributor (STATE Farm Bureau Federation, 2015), the agricultural industry must effectively and positively impact the news media to communicate truthful and accurate information to the public. Previous studies have examined why social media is being adopted and how it is being used, but there is little literature exploring social media's use as a media relations tool for the agricultural industry. A study exploring this topic could benefit agricultural organizations and future research by guiding the development of effective social media practices to communicate with and impact news media coverage of the agricultural industry. Therefore, the purpose of this study was to examine how agricultural organizations in [State] communicate via social media, how central [State] news media reports on the agricultural industry, and how the messages communicated via social media influence central [State's] media sources.

Theoretical Foundation

The study is grounded in the agenda-setting theory, uses and gratifications theory (U&G), and previous social media studies. The agenda-setting theory examines the relationship between the mass media and public opinion and was used in this study to determine how agricultural organizations and news media framed the messages and articles collected in this study (Merilainen & Vos, 2011). U&G theory examines how and why individuals select certain mediums to fulfill their needs and the gratifications they receive (Papcharissi, 2008). Previous agriculture-related studies found that agricultural communicators are using and returning to agricultural media because it is friendly and convenient but it limit their ability to communicate with the mainstream media (Ruth-McSwain, 2008).

Methods

A mixed-method approach was used with an emphasis on qualitative content analysis. Data was collected from seven [State] agricultural organizations' Facebook pages and four central [State] print and television news sources for 30 days (preceding and following the annual Farm Science Review). The data was recorded with individualized coding sheets and then analyzed to determine means, frequencies, and emerging themes via open coding. The reliability for this study was determined by using inter-coder reliability performed by two coders. Krippendorff's alpha was calculated ($\alpha = .976$) and deemed acceptable.

Findings

The researchers collected 140 Facebook posts. The social media analysis for this study determined that [State] agricultural commodity organizations use social media, but not to communicate with the news media. Several emerging themes determined including *(1) Recipes and Food* (n=31), *(2) Farm and Agricultural Stories* (n=30), *(3) Events* (n=21), *(4) Education and Programs* (n=13), *(5) General Agricultural Promotion* (n=12), *(6) Leadership and Professional Development* (n=11), *(7) Awards and Recognition* (n=7), *(8) Job and Internship Postings* (n=6), *(9) Political* (n=5), and *(10) Water Quality* (n=4). The means and frequencies were also calculated for the number of likes, shares, images, and links for each social media theme.

The news media analysis determined that the agricultural industry is receiving limited coverage, with only 18 articles found during the data collection. Emerging themes were also determined for the news media analysis and included: *(1) Water Quality* (n=7), *(2) Organic Food and Food Products* (n=3), *(3) Animal Welfare and Safety* (n=3), *(4) Agriculture and Science* (n=2), *(5) Disaster and Tragedy* (n=2), and *(6) Non-Direct Mention of Agriculture* (n=2). The means and frequencies were calculated for the number of sources, images, and agricultural organizations mentioned. Water quality was the only common theme between the social media and news media analysis and it was unable to be determined if the Facebook content had an influence on the news media coverage.

Conclusions

This study supported previous literature that the agricultural industry continues to use social media to agvocate and communicate messages to consumers (Payn-Knoper, 2009). Based on the limited population of news media stories covering agriculture, the study also supported existing studies that found that the agricultural industry receives limited coverage by the news media (New Agriculturalist, 2009). Themes that emerged from the social media analysis indicated topics or issues that agricultural organizations believe to be important. The comparative analysis of the social media and news media content determined that there was no direct influence on the news media by agricultural organizations' Facebook content. Though no direct influence was found, one common story emerged that was positively framed in both the Facebook posts and news articles. This example suggests that if the news media personnel are provided the proper resources and contacts, there is potential for the agricultural industry to receive positively framed news media coverage supported by credible sources. Overall, this study builds a solid literature and research-based foundation of past and current social media as a media relations tool. This study aids in the generation of future research questions and guidance for the development of effective media relations strategies by agricultural communicators.

Implications for Research and Practitioners

By communicating the results of this study with agricultural organizations and researchers, further research and effective social media strategies can be developed to guide the future of social media as a media relations tool. Future research stemming from this study should include topics such as how journalists are retrieving agricultural information and sources; the use of other social networking sites (SNS), such as Twitter and blogs, as media relations tools; and a network analysis of agricultural organization's SNS profiles to determine the reach and exposure of messages being distributed by agricultural communicators. Agricultural communicators could use this study to guide and further develop their media relations practices, such as message development, intent of content, and communication medium selection. The results of this study will also benefit agricultural communication educators by bringing awareness to the knowledge and skills that future practitioners and educators need to develop. Researchers and practitioners need to expand upon the findings in this study in order to further develop effective media relations practices, which in turn will benefit the overall perception of the agricultural industry by the public.

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The impact of high school leadership experience and its relationship to collegiate involvement

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The impact of high school leadership experience and its relationship to collegiate involvement

Introduction/Need for Research

Local governments and community organizations are faced with the challenges of changing demographics and the changing nature of the problems they are being asked to address (Astin & Astin, 2000). Local leadership is needed to build vibrant, resilient communities with diverse employment opportunities, skilled workers, high levels of educational attainment, and broad career aspirations in youth and adults and agricultural education, at the secondary and post-secondary levels, is uniquely positioned to provide students with leadership education to help meet these challenges (Doerfert, 2011). High schools have had a history of providing leadership programming (Morgan, Fuhrman, King, Flanders, & Rudd, 2013). Rosch and Coers (2013) stressed the importance of leadership education at the collegiate level, specifically in colleges of agriculture "As both future educators of agricultural students and contributors to the agricultural industry as a whole, colleges of agriculture play an important role in preparing students to take on these leadership roles" (p. 83).

Conceptual Framework

The college leadership development model (Foreman and Retallick, 2012) provided the conceptual framework for this study. The model illustrates the influence pre-collegiate and collegiate characteristics and experiences have on the impact of leadership development outcomes. The pre-collegiate experiences and collegiate sections of this model were the focus of this study.

Methodology

The purpose of this study was to explore college students' high school participation and those experiences impact on collegiate leadership experiences. Three objectives guided the study: 1) Describe high school student involvement; 2) Describe college-level student involvement; 3) Determine the relationship between high school and college involvement.

Traditional-age undergraduate college students in the College of Agriculture and Life Sciences at Iowa State University were surveyed (*N*=4375), using a web-based questionnaire, consisting of researcher-designed questions. Students were asked to indicate high school and collegiate clubs and organizations in which they participated, the number of years in which a student had participated (i.e., 1 = 1 year, 2 = 2 years, 3 = 3 years, 4 = 4+ years), as well as their highest level of involvement (i.e., 1 = member, 2 = committee or project chair, 3 = officer, 4 = president, and 5 = state or national leadership). A panel of professionals was consulted to establish validity. Dillman's (2004) five-step data collection approach was used, resulting in 1055 useable responses (24%).

Descriptive statistics were used to describe high school and college involvement. To determine the relationship, an involvement index was calculated by adding the years of involvement and highest level of involvement together for both high school and college involvement. High school involvement index was categorized into four levels and used as the independent variable for ANOVA to examine the relationship between the degree of involvement in high school and the degree of involvement in college.

Results/Findings

Of respondents who completed the survey, 397 (37.6%) of them were males and 658 (62.4%) were females. Eight-hundred and fifty-two (80.8%) entered the university direct from high school and 203 (19.2%) entered as transfer students. More freshmen completed the survey (352 students, 33.4%) than did sophomores (255 students, 24.2%), juniors (212 students, 20.1%), or seniors (236 students, 22.4%).

Students in the college were involved in a variety of pre-collegiate extra-curricular activities. In fact, 95% (n = 1006) of them reported being involved in some kind of extra-curricular activity, with athletics being the most common (n = 821, 77%). Fifty-three percent (n = 564) of students reported being involved in National Honor Society, 49% (n = 520) were in music, 45% (n = 480) were in FFA, and 41% (n = 439) were in 4-H.

Students maintained a high involvement level in college. Over 90% (n = 950) of respondents indicated they were involved in extra-curricular activities while in college. Students were most likely to be involved in curricular organizations (68.2%), followed by social/recreational (38.5%), and university-level organizations (21.2%). ANOVA results showed that students with the highest level of activity in high school were more likely to be the most involved in college (F(3,1051) = 51.15, p = .000).

Conclusions/Implications/Recommendations/Impact on profession

Students in the College of Agriculture and Life Sciences at Iowa State University are highly involved in both pre-collegiate and collegiate leadership experiences. At the high school level, students are highly involved in athletic, academic (e.g., NHS) and fine art activities (e.g., music) and, when they enter college, their focus shifts to curricular organizations and activities. Such a shift seems logical as students shift from a broad, general education in high school to a slightly more focused collegiate education that is driven by the requirements of their major and, in general, career aspirations.

Research would indicate and most college faculty and staff stress the value of college involvement beyond just attending class because of its impact on retention (Jenson, 2011; Tinto, 1987 & 1993), persistence (Bean, 2005; Reason, 2009), and personal skill development (Astin & Astin, 2000; Kuh, 1995). Furthermore, there is agreement that students come to college with a set of existing experiences, attitudes and behaviors (Bean & Eaton, 2000; Foreman & Retallick, 2012). This study provides empirical evidence that students who are involved in high school activities go on to be just as involved in college. The findings also suggest that, while college involvement is what is important and valued for many reasons, what students do before entering college may have a significant impact on their collegiate involvement.

These findings have implications for high schools and colleges. Both high school and college officials as well as parents should encourage and reward students who become actively involved in high school because those behaviors will continue into their college experience. The leadership involvement habits and behaviors of students in high school seem to transfer to college. Most importantly, these results suggest that, if we want local leadership to build vibrant, resilient communities as espoused on the AAAE Research Agenda (Doerfert, 2011), it starts locally with the investment in and involvement of students in high school activities.

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Researcher Poster Abstract

The Three E's of Service-Learning: How Pre-Service Agricultural Education Teachers Constructed Images of Service-Learning

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The Three E's of Service-Learning: How Pre-Service Agricultural Education Teachers Constructed Images of Service-Learning

Introduction

School-based agricultural education (SBAE) instructors struggle with delivering service learning as an effective method of instruction (Woods, 2002). Although empirical evidence to assess its value should be commended (Webster & Hoover, 2006), this deficiency in practice seems to persist (Roberts, 2014). Slavkin and Sebastian (2013) posited that a lack of understanding between the terms service-learning and community service might be at the core of this problem. However, a scarcity of empirical evidence exists to uphold this assertion.

To give practitioners of the pedagogy more direction regarding the delivery of effective service-learning experiences, Kaye (2004) offered the following five-stage process: (a) investigation; (b) preparation; (c) action; (d) reflection; and (e) celebration. However, Lake and Jones (2007) argued this process is too simplistic and neglects the deeply integrated and complex learning interactions that occur when employing this pedagogy. To begin to solve this issue, it is important to understand pre-service teachers' initial conceptions of service-learning. One technique for investigating such a notion is to analyze individual subject's depictions of the phenomenon illustrated through their personal reflections, such as drawings (Calderhead & Robson, 2001).

Focusing the Case

The purpose of this instrumental case study (Stake, 1995) was to understand pre-service agricultural education teachers' conceptions of service learning. The Fall 2014 student teaching cohort at [State] University (N = 17) served as the bounded system for this case. As a result, four males and 13 females composed the population. This study aligns with Priority 4 of the National Research Agenda of the American Association for Agricultural Education (Doerfert, 2011).

Methodology

As part of their introduction to the pedagogy under investigation, students were asked to list one word that described service learning and then draw an image that depicted the phenomenon in action. Drawings produced by the pre-service teachers served as the source of data for this study. The two researchers on this team, each scrutinized the data independently using the constant comparative method (Corbin & Straus, 2007). Robinson's, Kelsey's, and Terry's (2013) methodological decisions for analyzing mental models were followed in which we "identified, named, and counted within all drawings and recorded them on a spreadsheet" (p. 129). After analysis of all images, the researchers each shared their unique codes (Corbin & Straus, 2007). Through this negotiation process, the codes were compared, redefined, and combined (Corbin & Straus, 2007). Next, codes were integrated into larger categories where they were defined more distinctly (Corbin & Straus, 2007). The final step in the process was to construct a written report of the findings. The researchers attempted to build rigor and trustworthiness into the study through incorporating Lincoln's and Guba's (1985) recommendations for credibility, transferability, dependability, and confirmability. As such, we felt it was important to reveal that both researchers have prior experience in teaching. Further, one researcher serves as an associate professor, and the other is currently a graduate assistant at [State] University.

Findings/Conclusions/ Recommendations

The findings, conclusions, and recommendations are presented in the following narrative to detail how each theme represents participants' understanding of service learning.

Theme 1: Engagement

All participants depicted service learning as an *engaging*, action-based activity. For instance, the illustrations portrayed students engaged in a type of experiential learning activity. In addition, various images were summarized with action verbs such as "impactful" [Participant 17], "experience" [Participant 2], or "involvement" [Participant 8]. As such, it can be concluded that pre-service teachers connected that service learning is a form of experiential learning that requires *action* (Kaye, 2004). Little attention, however, was devoted to other components of service-learning's five-stage process (Kaye, 2004). We, therefore, recommend that more attention be placed in teacher preparation programs to address how to deliver a service-learning experience effectively. Perhaps, this change could reduce confusion regarding its use as an instructional tool.

Theme 2: Environment

Fifteen drawings were depicted in outdoor learning *environments*. For instance, images of service regarding horticulture-based projects, conservation opportunities, and home and community development were conveyed. The agricultural education literature on service learning promotes service learning in outdoor environments (Webster & Hoover, 2006). We suggest that teacher educators emphasize that service learning can occur through an array of formats. Through this emphasis, perhaps pre-service teachers will begin to understand service-learning's versatility as a pedagogical technique.

Theme 3: Enthusiasm

Eleven participants depicted forms of *enthusiasm* in their drawings. For instance, participants were portrayed with smiling faces and hearts during the service-learning experience. This finding is congruent with current literature, which elucidates that students become inspired to learn through this method (Slavkin & Sebastian, 2013; Woods, 2002). We encourage programs to continue to stress service learning as a tool that motivates students to learn the curriculum.

Discussion

The essence of pre-service agricultural education teachers' understanding emerged as *The Three E's of Service-Learning: Engagement, Environment, and Enthusiasm*. We posit these three factors serve as the foundation of the pre-service teachers' understanding of service learning. Perhaps teacher education programs could use this basis of knowledge to create interventions aimed at clarifying the effective delivery of service learning.

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Understanding the Challenges Surrounding Contentious Issue Conversations: Florida Extension Agents Perspective

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Understanding the Challenges Surrounding Contentious Issue Conversations: Florida Extension Agents Perspective

Introduction

Extension agent’s role in bridging the gap between land grant universities and the public has focused on providing invaluable knowledge to the public through agriculture, family and consumer sciences, 4-H youth development, and community development for the last century (Benge, Harder, & Carter, 2011; Warner, Hinrichs, Schneyer, & Joyce, 1998). However, agents’ roles have changed to accommodate the complex needs of the public; agents are becoming increasingly involved in handling contentious issues (Patton & Blaine, 2001; Warner et al., 1998). Agents are finding it difficult to address these issues within communities, as many are surrounded by emotional and explosive attitudes (Goodwin, 1993; Welch & Braunworth, 2010). While agent’s involvement in addressing these contentious issues may not be by choice, they are meeting their clientele’s needs by either facilitating these conversations (*moderating* method) or providing information so clientele may consider all perspectives of contentious issues (*contrasting viewpoints* method; Goodwin, 1993; Schumaker & Lloyd, 1997). In an effort to address these issues for clientele, Extension agent’s time is being constrained as they attempt to find credible information through the various mediums available (Bailey, Hill, & Arnold 2014; Conglose, 2000). Extension agents primarily use the Internet to seek out information for clientele but associate less credibility with this source. Conversely, agents associate the most credibility with Extension publications, research journals, and university specialist. Extension agents believe trustworthiness and quality are the most important factors when seeking out information, but also the most challenging (Bailey et al., 2014; Brain, Irani, Hodges, & Fuhrman, 2009). With time as a main constraint, Extension agents struggle to find credible and trustworthy information to serve their clientele as contentious issues arise (Bailey et al., 2014), while they also attempt to prevent burnout and stress as they balance their family life (Ensle, 2005). Therefore, in accordance with the national research agenda priority two, New Technologies, Practices and Products Adoption Decisions (Doerfert, 2011), the purpose of this study was to assess Extensions agents’ attitudes and the challenges they face when communicating about contentious issues.

Conceptual Framework

The human communication process between individuals focuses on three primary types of communication: expressive, accidental, and rhetorical (Stone, Singletary, & Richmond, 1999). *Expressive* communication involves messaging that encompasses emotions and the well-being or feelings of others. *Accidental* communication is usually a result of poor planning and includes unintentional messages being delivered. *Rhetorical* communication is a persuasive technique that is intentional and goal oriented (Stone et al., 1999). Extension agents regularly communicate rhetorically to persuade clientele to adopt new ideas and knowledge (Conglose, 2000). The emotional nature of contentious issues results in expressive dialogue where escalation can result in blame being shifted to others (Goodwin, 1993; Welch & Braunworth, 2010). Disaster prevention and trust building can result if situations are addressed properly (Telg & Irani, 2012). Discussions surrounding controversial issues must be organized and planned to prevent discussions from intensifying and resulting in chaos (Schumaker & Lloyd, 1997).

Methods

An online survey was sent to 350 Florida Extension agents to assess the attitudes and challenges ensued when communicating about contentious issues and 125 responded. A panel of experts reviewed the survey instrument to ensure content validity (Ary, Jacobs, & Sorensen, 2010). Respondents' attitudes were collected using a six item bi-polar semantic differential scale. The construct was reversed coded so positive adjectives were assigned a five and negative adjectives were assigned a one. The challenges agents faced when communicating about contentious issues was collected via an 11-item check all that apply question. The data were analyzed using SPSS ® 22 statistical software. Descriptive analyses were calculated to determine Florida Extension agent's attitude and the challenges faced when communicating about contentious issues.

Results

Overall, Florida Extension agents believed communicating about contentious agricultural and natural resource issues were *important* (M = 4.52, SD = .73), *essential* (M = 4.30, SD = .85), and *meaningful* (M = 4.21, SD = .72). However, they felt that communicating about these issues was also *difficult* (M = 2.66, SD = 1.03). Out of the 11 items assessing the challenges Extension agents face when communicating about contentious issues, respondents believed that *availability of false or misleading information* (n = 104, 83.2%), and *complexity of issues* (n = 104, 83.2%) were the most challenging obstacles. *Language barriers* (n = 25, 20%) and *lack of clientele trust* (n = 29, 23.2%) were the least perceived challenges when communicating about contentious issues with clientele.

Discussion/Recommendations

Respondents in this study believed communicating about contentious issues was important, essential, and meaningful. These findings exemplify the relationships Extension agents build with their clientele as they strive to enhance the well being of individuals, families and communities (Warner et al., 1998). Contentious issue conversations matter because the expressive nature of contentious issues are emotional and affect the people they work so hard for—agents genuinely care about their clientele (Stone et al., 1999; Welch & Braunworth, 2010). However, respondents also believed communicating about contentious issues was difficult. The explosive nature of these conversations comprises an unpleasant environment that causes agents to lose enthusiasm to facilitate them, which can result in stress and burnout (Enge et al., 2011; Ensle, 2005). These findings could contribute to the increased turnover Extension systems are experiencing. Respondents in this study reported availability of false or misleading information and the complexity of issues were the most challenging obstacles faced when communicating about contentious issues. These findings amplify the difficult tasks Extension agents are facing as they vigorously search for trustworthy and quality information to provide their clientele (Bailey et al., 2014). The complexities of these issues, and difficulty in locating reliable information, stresses the need for land grant universities to improve informational practices and continue research to aid Extension agents. The reliance on the Internet to disperse information has resulted in an excessive amount of less credible information reaching Extension agents. Additionally, future research should be guided to help answer some of the questions surrounding contentious issues so agents are better prepared to deal with these conversations as they arise. The human communication process reinforces the need for Extension agents to utilize rhetorical communication, control expressive communication, and prevent accidental communication when addressing contentious issues. When situations go wrong, how these problems are addressed can mean the difference between disaster prevention and trust building, and a crisis developing (Telg & Irani, 2012). Future research should focus on better understanding how Extension agents are utilizing the human communication process as they communicate about contentious issues.

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Utilizing Competing Narratives to Increase Critical Thinking Abilities

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Utilizing Competing Narratives to Increase Critical Thinking Abilities

Introduction/Theoretical Framework

Identified by McComas (2014) as 21st century skills, intellectual and practical skills, such as inquiry and analysis, critical and creative thinking, written and oral communication, and problem solving, have emerged as essential leaning outcomes of higher education (Association of American Colleges and Universities [AACU], 2004, 2007, 2010). These 21st century skills have since been organized into six primary categories: life skills, workforce skills, applied skills, personal skills, interpersonal skills, and non-cognitive skills (McComas, 2014). Further, Savvedra and Opfer (2012) suggest a variety of teaching approaches intended to improve 21st century learning skills. Among these approaches are making content relevant to students, developing thinking skills, addressing misunderstandings directly, and fostering creativity (Savvedra & Opfer, 2012). The pedagogical approach utilized in our study, competing narratives, was geared toward developing students' skills in the applied and personal skills categories. The applied skills category addressed accessing and analyzing information, effective communication, and determining alternative solutions to problems; whereas the personal skills category addressed curiosity, imagination, critical thinking, and problem solving (McComas, 2014). The pedagogical approach utilized in our study addressed the 21st century skills presented by McComas (2014) and employed the teaching lessons suggested by Savvedra and Opfer (2012) to encourage students to analyze and evaluate claims of two book narratives with vastly opposing viewpoints on global warming.

A primary tenant of constructivism states that learning should occur in authentic environments and thus, knowledge construction is enhanced when the experience is authentic (Doolittle & Camp, 1999; Splan, Porr, & Broyles, 2011). One role of higher education is to build on students' previous knowledge and authentic experience while pushing them to use higher-ordered thinking skills, such as those expressed in Bloom's (1956) Taxonomy. Specifically, the development of students' critical thinking abilities is often targeted through pedagogical approaches that urge students to perform in the higher-ordered thinking levels of Bloom's (1956) taxonomy, such as the *Analysis*, *Synthesis*, and *Evaluation* levels (Duron, Limbach, & Waugh, 2006). The pedagogical approach utilized in this study remained consistent with the constructivist approach by encouraging students to incorporate their personal experiences in the analysis, synthesis, and evaluation of two distinctly different global warming viewpoints expressed in two separate book narratives.

Methodology

Our study was designed to explore the impact of utilizing a competing book narratives pedagogical approach in an entry level, semester-long natural resource management course on the development of students' critical thinking abilities. The purpose of our study aligns with the American Association for Agricultural Education's National Research Agenda Research Priority Area Four: Meaningful, Engaged Learning in All Environments (Doerfert, 2011). The population for our study was all undergraduate students enrolled in a freshman level natural resource management course in the fall semester of 2014 (N = 209). Due to utilization of open-ended responses, as well as national reference norms, critical thinking abilities were assessed using the Critical Thinking Assessment Test (CAT) (Perry, Retallick, & Paulsen, 2014). The CAT includes 15 short answer questions based on real-world situations developed to accurately assess 15 important components of critical thinking (Center for Assessment and Improvement of Learning [CAIL], 2010). Each question addresses at least one broad component of critical thinking, including students' abilities to evaluate and interpret information, solve problems, think creatively, and communicate effectively (CAIL, 2012). All students enrolled in NRSM 101 (N = 209) were administered the CAT instrument in a pre-test/post-test design. Due to the limited availability of resources, primarily faculty scorers' time, and CAIL's (2012) recommendation of using a minimum of ten matched pairs, 40 matched pairs were randomly selected to be scored and 37 (n = 37)were deemed useable.

Results

The sample was primarily composed of females (62.2%) less than or equal to 20 years of age (67.6%). Nearly the entire sample (91.9%) self-identified themselves as white. Multiple paired-samples *t*-tests were conducted to compare pre-course and post-course critical thinking abilities according to the 15 specific skill areas assessed by the CAT (Table 1). Students' post-test scores were statistically ($p < .05$) higher than their pre-test scores on five of the 15 specific skill areas and on their overall CAT total score.

Table 1
Results of Paired Samples t Test of Students Enrolled in NRSM 101 (n = 37)

Skill area assessed	Pre-test	Post-test	p^a	Eff. Size^b
Evaluate strength of correlational-type data.	0.81	1.78	**	+ .78
Identify additional info. needed to evaluate a hypothesis.	1.32	0.62	**	- .68
Summarize pattern of results in a graph.	0.57	0.84	*	+ .61
Identify and explain the best solution for a real-world problem	1.49	2.59	*	+ .59
Use/apply relevant information.	1.03	1.38	**	+ .51
Identify suitable solutions for a real-world problem	0.65	1.03	*	+ .40
CAT total score	15.25	18.05	**	+ .52

^{a}Probability of difference; ^{b}Mean difference divided by pooled group *SD* (0.02 = small; 0.3 – 0.15 = moderate; > 0.35 = large). * $p < .05$. ** $p < .01$.

Conclusions/Implications/Recommendations

Reflective of McComa's (2014) 21st century skills and Savvedra and Opfer's (2012) teaching lessons, our primary conclusion from this study is that enrollment in a semester-long natural resource management course that utilizes a comparative book analysis approach to encourage students to analyze and evaluate claims can positively influence students' overall critical thinking abilities. Abiding by the tenant of constructivism wherein learning should occur in authentic environments and be enhanced by personal experience (Doolittle & Camp, 1999; Splan, Porr, & Broyles, 2011), the comparative book analysis approach impelled students to construct new knowledge from inspecting their own previous experiences and opinions of global warming and strive for the higher levels of Bloom's (1956) taxonomy. Implications for curriculum development stem from the conclusion that the comparative book analysis approach possessed a positive influence on students' overall critical thinking abilities. Therefore, the comparative book analysis approach should be considered by instructors who are seeking alternative approaches to increasing students' critical thinking abilities. Recommendations for future studies include utilizing a control group to explore more definitive causal relationships and incorporating a qualitative approach to explore the role student experience played in forming opinions on, and analyzing, issues related to global warming.

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