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ORAL PRESENTATIONS

001

Pencasting in University Agriculture Courses

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Pencasting allows an instructor to record pen strokes and oral comments while making notes, drawings, or calculations. Students can play the pencast and listen to the synchronized instructor comments as the written content is progressively displayed. Similar to the more familiar podcast, students can pause or rewind the pencast in order to process or review a particular point. Pencasting allows an instructor to explain a concept or calculation once while allowing an entire class of students to access the recorded explanation whenever and as often as necessary to understand the material. The purpose of this presentation is to demonstrate the pencasting process and provide examples of how I have used pencasts in a variety of agriculture courses. Pencasting requires a specialized pen, paper, and associated software, available for less than $150. Pencasts are easy to make and can be incorporated into class presentations and/or uploaded for supplementary instruction on course management platforms (e.g., Blackboard) or websites. I have used pencasts in several undergraduate agricultural systems courses to teach AC and DC circuit analysis, fluid power components and schematics, electrical controls, problem solving and technical calculations, landscape irrigation design, and other topics. I have also used pencasts as a method of reviewing homework problem sets and exams. In my experience, pencasts are an easy and effective way to use technology to extend the classroom by making relevant instruction available when needed and desired by students.

004

The Blue and Orange Initiative – Connecting Penn State and the University of Florida

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The Blue and Orange Initiative coupled two courses of similar content and delivery style from Penn State University (HORT 150 course - Plants in the Human Context) and the University of Florida (ORH 1030 - Plants Gardening & You) to improve the student experience at both universities. Partnerships among students were encouraged through extra credit opportunities with students interacting in a combined class Facebook site focused on plant-based challenges (PSU fall color versus Florida palm trees), plant and fruit exchanges (PSU apples to Florida and Florida citrus to PSU), and interactions leading to PSU and UF students becoming Blue and Orange Plant Pals. Over 360 students joined the Facebook group since it was initiated during the 10th week of the Fall semester. This resulted in 472 posts from 157 authors with 690 comments and 2600 likes of posts. Representatives from the Blue visited the University of Florida during the Spring semester to gain a better understanding of the ORH 1030 class dynamic and make personal connections with the 235 Orange students. Quantitative and open-ended questions from the course evaluations indicated that the students from both universities enjoyed the hands-on activities and friendly atmosphere, the common interest and experiences in growing plants for class, and appreciate the crossover information between liberal arts and science. The Blue and Orange initiative is funded through an APS/APLU teaching award in partnership with the Penn State University College of Agricultural Science and the University of Florida College of Agriculture and Life Sciences.

005

Online Learning Communities in Undergraduate Animal Science Courses

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Social constructivist approaches to learning and teaching suggest that learning occurs within a social context. Within that context exists a collaborative interaction between individuals, or in the case of undergraduate education, students. As of late, many educators are looking to Facebook as a means to establish collaborative communities in their classrooms. It has been found that students are very interested in using Facebook for educational purposes and those instructors who use Facebook in their classrooms have students with greater motivation and higher levels of learning. Facebook was utilized to create an online learning community in two different livestock handling techniques courses at a state university agricultural college. With the course instructors, campus veterinarian, and livestock manager serving as administrators of the Facebook group, students enrolled in the courses were added to the group at the beginning of the semester. The students were responsible for updating the Facebook group with pictures and narratives every four hours when they checked on birthing livestock. Additional posts to the online community included animal health concerns, record keeping, demonstrations of skills learned, communication with work groups, and collaborative efforts between students, instructors, veterinarians, and livestock management. This allowed for ease of documentation and communication if issues with the livestock arose. The group also served as a means for students and the instructors to communicate about assignments, internships, and other items of interest. Additionally, the instructors also used the online community as an assessment tool for participation, skill competency, and use of appropriate handling techniques.

006

An Analysis of Senior Student Attributes in a College of Agriculture

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The objective of the study was to examine similarities and differences among senior students in the College of Agricultural and Life Sciences. Of the 1,647 seniors in Spring 2016, 444 students graduated from a Florida high school that offered agriscience. Of that group, 121 were identified as having completed one or more agriscience credits ("With" students) and 323 had not ("Without"). Similarities existed between the two groups. Weighted high school GPAs were nearly identical (4.23 With, 4.26 Without). Total ACT and SAT scores were also similar. The two groups did not differ on Gender (59% and 58% female). Overall University GPAs and Upper Division GPAs were also similar. Several differences were found. A total of 165 seniors (37%) completed an A.A. degree prior to admission: 60% of With students and 28% for Without students. Similarly, 55% of With students had transferred from a community college compared to 25% of Without students. The groups also differed on race as self-reported at admission; 74% of the With students were White versus 58% of the Without students. The initial college of enrollment into the university also differed: 83% of With students enrolled in the College of Agricultural & Life Sciences, while 55% of Without students had enrolled in the College of Agriculture & Life Sciences. Differences also existed on student majors. While the two groups appear to be similar in terms of academics, their routes to admission were dissimilar. The college can utilize this analysis in investigating how to recruit and admit more students with agriscience credit and into low-enrollment majors.

007

Service-Learning Abroad: A Successful Approach to Rebuilding a Historic Irish Garden

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Service-learning is a proven pedagogical method that increases student engagement and promotes deep learning, and it has been used successfully in many types of horticulture courses. Service-learning has also been incorporated as part of study abroad programs to foster student learning and engagement during the international experience. This session will describe the process used to identify in-country partners, develop project parameters, and implement a long-distance planning process that resulted in the successful completion of a two-day service-learning project during an eleven-day study abroad program in Ireland. Each student completed a post-trip reflection using prompts such as: describe experiences that occurred on the trip; examine how you felt at different points during the trip; and articulate what you learned, how you learned it, why it matters, and what you will do with this new information. Students also had an option to use a lens shifting and comparative thinking approach to their reflection. Overall three key themes emerged from these student reflections including increases in horticulture knowledge, self-confidence, and cultural awareness.

009

Innovative Education in Agroecology for Five Competency Outcomes

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Innovative learning objectives in the Norway Agroecology MSc program are to develop five key competences and skills: Observation –examination of challenges in complex farming and food systems; Reflection – connection of theory with practice in class, field experiences, and thesis research, to understand systems interconnections and implications; Participation – involvement in fieldwork through personal engagement and interaction with stakeholders; Dialogue – multi-way communication among students, teachers, and people in the field; and Visioning – descriptions that transcend repetition of what is learned to move lessons learned into new future applications. Learning methods in a semester-long course include classes, field trips, in-depth interviews with farmers and food system stakeholders, frequent team meetings, and class reflections to help student teams process information. Outcomes are multiple scenarios presented to clients for their evaluation and potential adoption, scenarios that will help them meet their farm and community goals. We measure student success from mentoring class presentations and interactions, observing teams in action, reading project reports and individual learner documents, and frequent interactions within the learning community during the semester. Over 300 participating students, over 17 years' report that methods and analyses learned in the course were useful in their internships, future courses, and thesis research. Results of our evaluations have been widely reported in journals, book chapters, and conference proceedings. An important emergent property has been establishing and mentoring instructors in new and similar practical academic agroecology degree and certificate programs initiated in Sweden, Denmark, France, Italy, Ethiopia, Uganda, Sri Lanka and India.

010

Engaging Undergraduates with Team–Based Learning Strategies and Technology Assessment

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Team-based learning (TBL) is an evidenced-based collaborative learning and teaching strategy designed around units of instruction delivered in a three-step fashion of preparation, in-class readiness assurance testing, and application-focused exercises. Four underlying principles of team-based learning include proper formation of student groups, student accountability for pre-learning material, team assignments promoting learning and team development, and providing immediate feedback. This presentation describes the results of adopting a form of TBL and coupling it with an online interactive quiz program (Kahoot.it) to engage undergraduate students enrolled in an agriculture technology management (AGTM) lecture and laboratory course. On the first day of class, students complete team formation questionnaire. Due to the nature of our AGTM course, enrollment is limited to 24 students. Lecture material is posted to the course online site for student review. The next class session, students complete an individual assessment (IRAT), and then meet in their teams to complete a group assessment (TRAT). An Immediate Feedback Assessment Tool (IF-AT) is used to give student teams immediate results. Both individual and team scores are recorded. After a presentation of the lecture materials students worked in their teams to participate in a post-lecture material review session. An online quiz program allows student working in teams to view questions and responses, and respond using their smartphones. Points are awarded to teams answering correctly in the shortest amount of time. Student feedback solicited was very positive and requests made to continue using the process.

012

All Together Now: Using Group Tests to INcrease Student Learning

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Enhancing students' ability to work on teams is an important part of the college experience. The use of group tests enables students to work collaboratively to assess their own learning and allows more time to discuss course content. Group tests were implemented in Introduction to Agricultural Information Science at MSU in Fall 2015 in addition to individual assessments. Students were told they would complete two tests as a group. They found out their group members on the test day. Each test had 11 groups with 3-4 students in per group. Students were encouraged to discuss each question. The class average for test one was 76% and 90% for test two. This was an increase from the previous fall when the class average for test one was 70% and 81% for test two. After each test, students completed a satisfaction instrument. (Test 2, n=37, scores are included below). On Likert-type questions ranging from 1 = strongly disagree to 5 = strongly agree, students indicated the group test enhanced their learning (M=4.20, SD=0.65) helped them understand difficult concepts (M=4.16, SD=0.79), were enjoyable (M=4.38, SD=0.63), and were a nice change of pace from individual assessments (M =4.65, SD=0.58).

They also did not find them distracting (M=1.59, SD=0.63) or confusing (M=1.70, SD=0.73). The structure of the group test can be done in a variety of ways and needs to be taken into consideration before implementation.

015

Developing Entrepreneurship Skills in Agribusiness Graduates

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Developing entrepreneurship skills in college students using traditional classroom teaching methods can be a challenging task. Oftentimes the development of entrepreneurship skills is something that needs to be learned through experiential activities and does not lend itself to lectures and individual assignments. It is important to be innovative in the learning process for developing entrepreneurs through interactive real-world situations. In 2015, agribusiness faculty developed an entrepreneurship baseline of student perceptions of entrepreneurship skills to develop appropriate teaching methods. This project demonstrates the changes that were implemented as a result of student responses. Innovative techniques were introduced to better simulate the entrepreneurial process to the students. The use of pitch contests, team building and professional workshops provide a realistic approach to developing student understanding of the entrepreneurial process and decision making. The aforementioned techniques led to increased student participation and willingness to engage in the entrepreneurial process. Increased confidence in presentation and networking skills were also benefits for students. These techniques were not without drawbacks, including increased faculty workload, student fatigue, and budgetary issues. The overall success of these techniques outweigh the drawbacks and the faculty look to increase their use in the future. The pitch contests were found to be the most realistic tool, but they also required the most buy-in from students, faculty, and industry partners.

019

Service-Learning as an Effective Tool in an Animal Breeding Curriculum

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Service-learning allows students to learn in a real-world setting, while engaging the community with a useful service. In Spring 2016, a service-learning opportunity was provided in an Animal Breeding course at Tarleton State University. The project, Farm Partners, matched small groups of students to area farms having animal breeding challenges. Students met with the Farm Partners, assessed the challenge, and presented a viable solution at the end of the semester. Students could choose to participate in the Farm Partners project in lieu of two homework assignments and the final exam. Data were collected to assess the students' experience and satisfaction, as well as mastery of course concepts in the non-traditional teaching format. The participation rate of the service-learning project was 59% (29/49 students). All students were given a skills assessment quiz to gauge their mastery of animal breeding concepts. No difference (p=0.99) in skills assessment was seen between the service-learning and non-service-learning students at the end of the semester. Students rated the effectiveness of learning animal breeding through this project 3.95/5.0, with 5 being extremely effective. Students reported improved industry awareness and curriculum connections as major advantages in their reflection assignments, and 78% of the farms planned to implement the students' proposals.

021

Utilizing Tour Stops as Community Partners in an International Service Learning Course

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Countless studies tout the benefits of service learning and the improvement in critical thinking, knowledge retention, responsibility, and engagement. Study abroad experiences advance cultural awareness, empowerment, understanding of agricultural practices, and personal, career and social development. Texas Tech University led a service learning advanced video production course in Spring 2016 in Belize. Each student was assigned a community partner to create a promotional video. The community partners doubled as a tour stop. Stops included chocolate, coffee, spice, banana, and multi-crop farms; archeology, jungle, and culinary tours; and a zipline. For the first half of the semester, students improved their video production skills, learned about their community partner, and developed a plan for producing the promotional video. At each tour stop, the student assigned to that business was responsible for directing the other students to shoot the video and photos he or she needed for the partner's video. Students worked together to conduct video interviews to be used in the videos. Following the tour, the students edited the video and then shared it, along with extra photos and videos, with the community partner. Some of the community partners are currently using the student-created videos on their web or social media sites. Students in the course improved their teamwork, photography, videography, and editing skills. Additionally, they learned how to work with a client from a different culture with very different needs from an American business. Production agriculture, cultural, culinary, financial, and business awareness in Central America improved drastically amongst the students.

022

Active Learning in a Lecture-Based Animal Science Course

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Providing opportunities for student engagement in active learning can enrich their overall educational experiences, facilitate communication and critical thinking skills, and encourage academic success. Communication-intensive activities were integrated into a Lactation Physiology course to address curricular needs ascribed by previous students and industry professionals. One activity involved the review and discussion of peer-reviewed journal articles corresponding to lecture topics throughout the semester. Students were placed in small discussion groups and assigned articles. A rubric was provided, and groups met outside of class to prepare presentations and discussion questions. Additionally, all students were required to write article reviews and submit on discussion days. A second activity was developed to address a re-occurring deficiency in knowledge of hormone function, as evidenced by sub-optimal quiz grades. Students were randomly assigned to groups with one hormone per group. A rubric was provided and groups were given class time to prepare brief presentations pertaining to their hormones, which they administered at the end of the same class. Students showed marked improvements in communication skills, analytical and critical thinking skills, as well as personal confidence and teamwork across both activities. Groups excelled in creativity and enthusiasm during the hormone activity, as well as significantly increased their grades on the corresponding section of the final exam. Students rated the activities highly, emphasizing a better understanding of lecture topics and increased confidence with journal article analysis. It is hoped that these activities can serve as a model for similar lecture-based science courses attempting to integrate active learning experiences.

023

The [Mascot] AgCademy: A Model for Alternatives to Dual Enrollment

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In response to University recruitment barriers, the [Mascot] AgCademy was created to expose students to agricultural careers and enable them to obtain college credit without the burden of tuition. The [Mascot] AgCademy allows high school students to enroll in online non-degree modules and, once enrolled at the university and with departmental approval, complete an examination for course credit, as aligned with the university policies. The objective of this presentation is to share the [Mascot] AgCademy's parameters in order to offer programs with similar restrictions and policies an avenue through which they can offer cost effective postsecondary options to high school students. The University of Arkansas requires that all affiliated courses are taught by faculty. The [Mascot] AgCademy's modules are designed by university faculty members, approved by departments, and are offered completely online independent of high school instruction. University policies explicitly prohibit tuition discount programs. The credit-by-examination policy already existed within the university system, as did the online not-for-credit course infrastructure. The credit-by-examination policy allows enrolled students to request an approved examination for course(s) in which they feel they have sufficient knowledge to test out of and receive credit on their transcript; a nominal fee is assessed for each exam. The university's online infrastructure includes a series of courses offered for consumption by the public for $39 each. By utilizing these two existing components, the [Mascot] AgCademy enables students to benefit from tuition savings and experience the high quality educational experiences for which the University of Arkansas is known.

024

Does Structure Alter Students' Perceptions of Group Projects?

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The objective of this study was to identify elements of group work that help or hinder students' learning experiences, and measure whether the structure of a project affects students' perceptions of the endeavor. Students enrolled in a senior-level agribusiness management course at Illinois State University complete a semester-long group project utilizing scaffolding to break the project into seven assignments of increasing difficulty that, when combined, comprise a business plan for a new agri-food firm. Students are assigned to work groups, each group establishes its own ground rules, and students complete a series of individual reflection assignments relating to their group's progress. Questionnaires were administered to the class in Fall 2016 before, halfway through, and upon completion of the project addressing students' prior group project experiences, their group's progress, and their perception of the process upon completion of the project. Responses indicated 90.9% of students (n=30) strongly agreed that scaffolding helped their group succeed, 63.6% (n=21) agreed that establishing ground rules helped their group work better together, and 75.8% (n=25) strongly agreed that they clearly understood professor expectations of them in this project. A paired-samples t-test comparing the mean opinion about group projects prior to this experience to the mean upon its completion found a significantly positive increase in opinion (p<0.001). This study suggests ways in which group projects can be structured to provide more positive learning experiences, and will be continued in subsequent semesters.

028

Classroom Assessment Techniques for Student Comprehension Evaluation

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Classroom assessment techniques (CATS) assist with evaluation of student course comprehension. Assessments are categorized according to the aspect of course comprehension measured. CATS may measure knowledge and skills crucial to course understanding, learner attitudes and self-awareness of course competency, or student reactions to instructional methods, classroom activities, and/or assignments. The primary objective of this study was to utilize multiple CATS in agribusiness/agricultural economics courses at two non-land grant colleges of agriculture to assess students' course competency and comprehension. Results from each institution were compared to determine optimal instructional methods for specific course topics. CATS were utilized during the Spring 2017 semester in agricultural finance and farm management courses at two non-land grant institutions. Courses were comprised of 30 to 60 students. CATS were used 1-3 times per week in each course and measured students' course mastery, learning self-awareness, and instructional reactions. All student feedback was anonymous. Feedback was examined after each assessment, and then used to develop subsequent course lectures. For both institutions, results indicated that CATS improved student engagement. Feedback assisted instructors with determining areas of difficulty and ease for students. CATS anonymity encouraged student honesty regarding course mastery self-confidence. Results also provided substantial feedback regarding areas in which teaching improvements were needed. Overall, utilization CATS in agribusiness courses improved student engagement and provided instructors with feedback regarding student comprehension and course mastery. Please consider this abstract for an oral presentation.

033

Transdisciplinary Undergraduate Water Education: Pedagogical Reflections

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Societies today face an array of water-related challenges within the Food-Energy-Water-Nexus. To prepare students to become tomorrow's global citizens, postsecondary learning experiences must support them to learn reason about socio-hydrological issues such as agricultural water use, water quality, and water security. However, undergraduate courses designed to cultivate water literacy are few and far between. To begin to address this need, we are engaged in a 3-year, NSF-funded project focused on the iterative design, implementation, and study of a new, introductory (100-level), interdisciplinary course - Water in Society – at the University of Nebraska-Lincoln (UNL). Here, we report on the Scholarship of Teaching and Learning in which we are engaged around the first iteration of the course, during which we served a diverse population of students (n=45) from a variety of majors (STEM and non-STEM) and backgrounds. We utilize design-based education research to engage in iterative development and refinement of the new course, drawing upon data collected during the course that includes student artifacts, interviews, and pre-/post-course assessments, to investigate students' science content knowledge, beliefs, and reasoning about socio-hydrological issues, as well as their model-based reasoning and systems thinking, all of which are core characteristics of the FEW- Nexus. Findings illustrate growth in student outcomes over the semester, as well as key interactions between conceptual understanding and socio-hydrological systems thinking. We use these empirical findings to illustrate and discuss

challenges and opportunities we have experienced as an interdisciplinary team engaged in undergraduate education in the FEW-Nexus, as well future directions for the course.

036

Engaging Undergraduates in Soil Sustainability Decision-Making

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Continued agricultural productivity hinges on understanding how to manage soil resources. A two-week undergraduate introductory-level module: A Growing Concern: Sustaining Soil Resources through Local Decision Making was collaboratively developed through the InTeGrate Project. InTeGrate modules and courses engage students in grand challenges of sustainability (e.g. agriculture, water, climate) using active learning strategies. In A Growing Concern, students examine physical and chemical distinctions between intensively managed agricultural landscapes and natural vegetative types. They analyze geospatial and soil profile data to identify how intensive land management threatens soil sustainability. After exploring land practice and climate impacts on soil, they create extension-style fact sheets that provide recommended practices to reduce soil erosion. To maximize accessibility, we piloted the module in three settings: 1) an interdisciplinary Ecological Agriculture course at a Land Grant Institution, 2) a Geology of the Critical Zone course at a 4-year college, and 3) an Introduction to Environmental Science course at a 2-year community college. Classroom observations using the Reformed Teaching Observation Protocol revealed that the instructors used reformed teaching practices. Students also commented favorably on the hands-on nature of the module within focus group sessions. All students

passed the culminating fact sheet, which was aligned with the rubric used in module development. Students had some difficulty interpreting site-specific geologic data and applying systems thinking. Revisions to instructional materials emphasized local data and greater systems diagramming. Overall, assessment evidence supports the use of A Growing Concern to promote active engagement and achieve module learning objectives related to soil sustainability.

037

Teamwork Can be Taught: Examining Team Process in Capstone Courses

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Teamwork-based class projects are often met with strong resistance from undergraduate students. However, the benefits of experiential team-based learning have been demonstrated in a variety of fields, including medicine, law, business, and education. This study describes the process and evaluative methods used to prepare classroom teams for effective teamwork. Food Product Development is the senior capstone course for Food Science majors at a large, public, research university in the Midwest. Student success in the course depends on establishing a positive team-based culture. During the fall 2015 semester, time was conscientiously dedicated to team building and team charter development, including the identification of team roles, responsibilities, accountabilities, and most importantly interventions. To determine whether the focus on teambuilding had an impact on teamwork effectiveness, student teams from the fall 2015 semester were evaluated against student teams in the Agricultural Education capstone course: Collaborative Leadership. Students completing the Collaborative Leadership course are in the Agricultural Leadership Education major or the Leadership Studies minor and have completed multiple leadership courses that require teamwork and analysis of team processes. At semester's end, teamwork effectiveness in both classes was evaluated

using an adaptation of a validated teamwork survey instrument. Data analysis indicated that for 21 of the 26 teamwork characteristics, no statistical difference resulted between the two student groups. This finding suggests that focused effort on team building in a food science class can enhance the student teamwork experience to a point comparable to a capstone course in collaborative leadership.

039

What's Behind the Barn Doors? – An Inquiry Project for Animal Science

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An inquiry-based project "What's Behind the Barn Doors?" was offered to 115 students in an introductory animal science class to provide a framework for student learning. The project consisted of five modules or "doors". Each door opened for a few days or weeks which meant that students could work on that module during that time. To maintain interest and engagement, students were not told what each door involved until the day it opened. Door 1 was "Inquiring" designed to tap into student curiosity and have them articulate a question that they came into the class with. Door 2 was "Mastering," where students were instructed to learn in detail the answer to the question and the science behind it. Door 3 was "Creating" where students used the knowledge that they had acquired to develop a learning module to help educate other people about the issue and the science behind it. Door 4 was "Sharing" where the students practiced their learning module on a minimum of 10 people outside of the class and obtained written feed-back on their effectiveness. Door 5 was "Reflecting" where students conducted a self-reflection on the process. The project made up 40% of the course marks and lectures, field trips and hands-on animal experiences were offered as well. Some door projects required a mark of at least 80% before the next

door could be accessed. The 115 questions submitted covered a wide spectrum of agricultural species and issues (welfare, product development, physiology, feeding, breeding and environmental impact).

040

Developing a Short-Term International Study Abroad Field Trip

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Colleges of Agriculture are looking to provide varied and innovative types of international experiences that appeal to a multitude of students. One such opportunity is a short-term international field trip, which is defined as a program lasting less than five days in country. Short-term international field trips are more cost effective for students, take less faculty time (in country), and provide an opportunity for innovative high-impact learning experiences. For the field trip to be effective, the instructor must choose an andrological, pedagogical, or learner-centered framework to deliver the elements of the program. In the case study to be presented, the instructors chose the learner-centered teaching and assessment model from Huba and Freed consisting of: (a) formulating learning outcomes, (b) developing assessment measures, (c) creating experiences focused on outcomes, and (d) using assessment results to improve learning. The instructors took 13 students on a four-day learning experience to the Hacienda Santa Clara located in the San Miguel de Allende region of Mexico. While there, students focused on food security, international leadership, and service-learning. Data was collected pre-and-post experience to validate the Huba and Freed model for impact and effectiveness. Results show that the experience had a significant impact on the learning and cultural awareness of the students. The objectives of this presentation are to share the Huba and Freed model, describe how the model was utilized for this high-impact learning experience, and discuss how participants could integrate the model into field-trip preparation.

043

Does Homework Help in Assessment Preparation at the College Level?

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Numerous researchers have analyzed the relationship between homework and academic achievement. However, the existing body of knowledge in this area remains largely inconclusive. Students' academic achievement at the University of Tennessee at Martin were monitored in two distinct courses: a math-intensive course (n=72) and a non-math intensive course (n=40). For this study, the math-intensive course was defined as a curriculum heavily relying on the students understanding of basic algebra; the non-math intensive course was defined as being completely absent of math within the curriculum. The researchers sought to investigate if students would score higher on assessments if they had completed the homework within their respective class. Furthermore, the researchers compared student academic achievement results of the two courses based on assessment scores and completion of homework relating to the assessment material. The initial data were analyzed for comparison. For the math-intensive course, students who had completed all the homework scored an average of 10 points higher on assessments. For the non-math intensive course, students who completed all homework scored an average of 14 points higher on assessments. It can be concluded from the initial analysis that students who complete all homework assignments earn higher assessment scores. The data collection will continue so that a more in depth statistical analysis can be conducted. If homework completion equates to student success, college teachers should strive to understand barriers restricting students to complete homework and ensure the use of quality assignments that reinforce a students' understanding of the curriculum.

044

A Career Fair Tailored for Students in the Agricultural Sciences- Is It Working?

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A career fair specific to students in Agricultural Science and Engineering Technology (ASET), and Science, Technology, Engineering, and Mathematics (STEM) is held each spring to connect students with prospective employers. Students participating in the career fair were surveyed to gain feedback on event efficacy (n=75). The study was aimed at: 1) assessing students' awareness of the event, their utilization of Career Services, classification of students participating in the career fair, and 2) identifying key factors influencing the overall rating of the ASET/STEM career fair by students. Descriptive statistics and multiple linear regression were used to address objectives 1 and 2, respectively. Results showed that the majority of students became aware of the event from their professor (45%) and the primary service offered by Career Services students' used was the online job listing (38%), followed by resume assistance (17%). Participation in the career fair was dominated by juniors (37%) and seniors (33%), though even some freshmen attended (9%). The average student rating of the career fair was 4.12 on a 1-5 Likert-type scale with 5 being most favorable. Regression analysis indicated that overall student rating of the career fair was significantly and positively influenced by how the event fit their schedule ($p<0.05$) and the number of employers' present ($p<0.01$). Results indicate that Career Services should partner directly with faculty, the students' primary information source. Bringing more employers to campus and seeking mutually agreeable times for students and employers to interact will help increase overall student satisfaction with future career fairs.

046

Measuring Preparedness to Advocate for Agriculture: A Pre-Test/Post-Test

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Consumer misinformation and distrust in science has made it increasingly important for graduates of agricultural programs to be equipped with the knowledge to advocate for a variety of industries. This need guided the development of a course to provide students with skills and information to advocate for agriculture face-to-face and online. The purpose of this research was to determine how students' knowledge and ability to advocate for agriculture increased over the course of a semester while enrolled in an agricultural advocacy course. Students were asked to respond to four statements regarding 15 agricultural industries (1=strongly disagree and 5=strongly agree). Statements enquired about student knowledge, comfort level with face-to-face advocacy, comfort with online advocacy, and connection with an expert in each of the 15 agricultural industries. Additionally, demographic information was collected including membership in 4-H and FFA and involvement in farming and ranching. Twelve students completed both the pre-test and the post-test. A paired samples t-test was completed to evaluate increases in knowledge (t(-2.28), p=0.036, Cohen's d= -1.209), comfort level with face-to-face advocacy (t(-3.21), p=0.009, Cohen's d= -1.194), comfort with online advocacy (t(2.94), p=0.022, Cohen's d=1.448), and connection with an expert (t(-2.90), p=0.016, Cohen's d= -1.174), in each of the 15 agricultural industries. Students enrolled in the course significantly increased their ability to advocate for agriculture. Other agricultural programs would benefit from implementing an agricultural advocacy course into their curriculum.

047

Evaluating Adult Learner Experiences at a State Fair Extension Exhibit

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Informal science education and communication through museum-quality exhibits enables organizations to impact visitors' attitudes about agricultural and environmental science concepts and issues. State fairs offer unique opportunities and contexts for fairgoers to engage with information via interactives, demonstrations, and research presentations from Extension. Raising, a 25,000 square-foot agricultural and environmental education complex located on the state fairgrounds, is an example of public informal science education. The goal of the exhibit is to engage visitors of all ages and raise awareness about agricultural issues related to food production, nutrition, soil, and water. This study used a mixed methods approach and employed touchscreen iPad surveys, audio-recorded interviews, and observations to determine: (1) demographics and backgrounds of adult visitors, (2) exhibit activities and information that had the most and least impact according to adult visitors, (3) if changes in perceptions and attitudes toward agriculture and the environment occurred as a result of adult visitors' experiences, and (4) explored differences and similarities in experiences of adult visitors with agricultural backgrounds versus non-agricultural backgrounds. Data collection took place during the 2016 State Fair. Survey results (n=93; ages 19-66) showed three out of four respondents most enjoyed the exhibit's walkable, interactive state map and outdoor living area, greatly enjoyed videos and text banners, and least liked games in the exhibit. Non-agricultural respondents were more concerned about foodborne illness and pesticides as

compared to farmers, ranchers, and industry members. The exhibit also appeared to positively impact consumers' attitudes about the importance of agriculture.

048

Perceptions of Culture Impacted by a Short Study Abroad Program

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Students need to be prepared to work in a globalized workforce and within different cultures. The purpose of this study was to explore the impact of a short study abroad program on students' perceptions of culture. A qualitative content analysis was used to code for emerging themes in student reflection journals. Sixteen graduate and undergraduate students from one university participated in the "Food and Culture in Southern France" study abroad program. Fifteen journals (n=15) from the 2015 and 2016 programs were analyzed. While in France, students cooked with Michelin star chefs daily, interacted with locals at a farmer's market, and toured a variety of agricultural operations. Journal entries about cooking were concise and descriptive of the process. When the students were at the market or an agricultural operation and interacting with French locals, the journal entries reflected students' perceptions and expectations related to culture. Students connected personal experiences to the observations they made in the market and at farms and compared French culture to their own. The students expressed a desire to learn another language after realizing most of the French people with whom they interacted were bilingual. They also expressed an interest in learning more about agricultural production in France and the United States. Additionally, students communicated surprise at how pleasant their interactions were with locals. Experiences outside of the kitchen led students to reevaluate their cultural expectations, express a desire to develop language skills, and become more culturally competent.

050

Employer Expectations of a Career Fair Designed for Students in the Agricultural Sciences

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The ultimate measure of student success is finding a suitable career. Career fairs connect employers with students venturing into the job market. Awareness of what prospective employers are seeking in a candidate could benefit enlightened students. This study analyzed the perspectives of potential employers about the career fair and the students participating in the event. Prospective employers (n=39) completed an exit survey gauging their impressions of the event. Descriptive statistics were used to analyze the responses to key questions. Responses to key student-related questions were evaluated using paired t-tests. Multiple linear regression was used to assess the factors associated with the overall rating of the career fair. Prospective employers were positive about the event with 61.54% rating it Great and 35.90% rating it Good. Employers were pleased with student professionalism rating it Great (58.97%) or Good (33.33%). However, there was a greater dispersion in responses when asked about candidate attire, with Average (15.38%) and Fair (5.13%) emerging. Most employers (53.85%) planned to invite 1-5 candidates for further interview and 23% expected to interview 5-10 candidates. Interestingly, over 50% of employers surveyed considered a student's community service experience only of average importance. Employers' perception of candidate professionalism was significantly higher (average score=4.51, p<0.001) compared to candidate attire (4.12) and overall impression of the candidate (4.23). The only explanatory variable of ten used in the regression that was significantly associated with the overall rating of the career fair was candidate professionalism displayed in interaction with prospective employers (p<0.01).

052

Recommendations of Agriculture Professors in Teaching Online Courses Effectively

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There is a growing demand for online courses from college students. However, teaching online courses brings new challenges to anyone who is planning to teach an online course because of the difference between teaching a live class and a distance education class. Some faculty members have years of experience in teaching online and their knowledge and experiences would be valuable to others. The purpose of this Delphi study was to determine the best practices in planning and delivering effective online agriculture courses. The main objectives of this study were to determine:1) the best practices in planning and teaching online courses, and 2) to identify the greatest challenges in teaching courses online. The modified Delphi techniques was used to achieve the objectives of this study. The study was conducted with a group of 20 selected faculty members having an extensive experience in teaching online in a College of Agriculture and Life Sciences. Findings indicate organizing the course content into logical, very structured class segments is important. Having learning activities where videos and narrated class materials such as PowerPoint are also needed. There should be weekly activities such as discussions, quizzes and assignments to keep the students engaged. Also, a variety of class materials and approaches to teaching are needed. The greatest challenge is keeping online students engaged with instructional materials. The professors suggested that faculty attend university sponsored workshops when available or consult with experienced colleagues. This presentation has implications for instructors who are planning to deliver courses online.

054

Using Multimedia Case Studies to Teach Agricultural and Natural Resources Issues

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As part of a United States Department of Agriculture Higher Education Challenge Grant, Texas Tech University, the University of Florida, and Colorado State University created five multimedia case studies to teach issues communication relating to food, agricultural, natural resources, and human sciences (FANH) issues. The anticipated overall impact of this three-year project is to improve the quality of undergraduate education in the food and agricultural sciences through the development and integration of case study modules. The case studies encourage improved critical thinking about the communication process through interactions with FANH issues. Students learn to seek out additional information on controversial issues, understand others' opinions, and develop messages that advance the understanding of agriculture and the environment to a variety of audiences. The underlying goal of this project is to use individual case studies to illustrate how different issues – such as invasive species, rural community development, crisis communication, food safety, animal welfare, and water conservation – not only impact an individual case, but also are interrelated. The multimedia case studies were pilot-tested in fall 2016. Results indicated students' critical thinking styles were mixed ranging from engagement to seeking information. Students were more apt to discuss issues about FANH more often after completing an issues course with the case study approach. These case studies will be available for others to adopt in 2018. It is recommended that instructors utilize in their courses these or other case studies, which can enhance critical thinking and encourage stu-dents to discuss major FANH issues.

056

Science Literacy through Animal and Food Sciences

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Over 50% of high school students in the United States lack proficiency in science, and in Nebraska, 27% of 11th grade students lacked proficiency in science during the 2014-15 school year. In response to this national and local issue, this innovative project was funded by the Nebraska Coordinating Commission for Postsecondary Education and aims to enhance science literacy by providing secondary agriculture and science teachers with a rigorous 12-month professional development program focusing on animal and food sciences through the context of genetics, muscle biology, microbiology, and nutrition using inquiry-based teaching methods. This project addresses three objectives: (1) improve secondary life science educators' content knowledge within the sciences (genetics, muscle biology, microbiology, nutrition); (2) improve secondary life science educators' instructional approaches through incorporation of inquiry based learning techniques; and (3) increase secondary life science educators' ability to use principles of animal and food science, as a context for teaching science. Developed curriculum will include basic content information, inquiry-based learning lesson plans, and student reflection instruments. Each inquiry-based learning activity will be designed to stimulate higher-order critical thinking and provide time for student reflection. The hands-on professional development and follow-up webinars are designed to enhance teacher performance and student learning as usage of the scientific method should enhance student inquiry, research, and data interpretation. The inquiry-based teaching approach and technical content provided will align with Nebras-ka Science Standards and the national Next Generation Science Standards, allowing teachers to incorporate what they learned through the Professional Development into their courses.

060

Attitudes and Effectiveness as Measures of Student Satisfaction with Team-Based Learning

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To assess the receptivity of Team-Based Learning (TBL) among undergraduate students, the TBL-Student Assessment Instrument© (TBL-SAI) was administered in select agribusiness courses (n=308). Though the original instrument was de-signed to assess student accountability, student preference for TBL or lecture, and overall student satisfaction, it became apparent from category descriptions and a review of individual questions comprising the instrument, that it might be prefer-able to combine some questions. A confirmatory factor analysis demonstrated the reliability of our assertion. A Structural Equations Model (SEM) with six latent variables was used to assess the factors associated with satisfaction towards TBL consisting of attitude and effectiveness scales. Preparation, contribution, TBL/lecture distraction, and TBL/lecture recall are latent constructs measuring students' preparation for the class, individuals' contribution to their team, potential distractions in TBL and lecture settings, and how TBL and lecture helps with recall and retention of information, respectively. Even though a TBL classroom environment is generally noisy, students perceived lower distraction with TBL (2.41/5.0) compared to traditional lecture (3.35/5.0). Subsequently, results from the SEM indicated that the lower level of TBL distraction and higher perceived TBL recall were each significantly associated with a more positive attitude and higher effectiveness, at a 0.05 significance

level. Higher contribution was positively associated with effectiveness (p<0.05). Conversely, better pre-class preparation was negatively associated with effectiveness (p<0.05). Additionally, previous positive group-work experience, higher expected grade, and making a close friend through TBL all contributed to higher overall satisfaction, while higher GPA was associated with lower satisfaction.

062

Learning Style and Classroom Community Preference by Delivery Mode

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Modern instructional technologies may decouple learning from the physical location of knowledge discovery, yet student interaction among peers and with instructors remains imperative to learning. It is of interest, therefore, to assess whether student learning style and learning community preferences are satisfied within available course delivery modes. This study detects and measures distinct learning style, measured by the Grasha-Riechmann Student Learning Style Scales, and classroom community preference, as measured by the Classroom Community Index, among a convenience sample of 66 undergraduate agricultural economics or agribusiness students. These enrolled in an elective course at two four-year, and one two-year, higher learning institutions located in North Dakota. Students at the four-year schools could elect to participate in the course via traditional classroom or online delivery; two-year school students received the course via distance (videoconference) delivery. Comparison of whether learning style and community preference were accommodated in all three modes simultaneously is a major contribution of this study. Differences in learning style, community preference, delivery mode are observed but not extensive in our sample. No one delivery mode best met the learning activity preferences of the strongest, or the most common, learning style-community sense combination. This suggests knowledge discovery, facilitated through any modern course delivery mode, can meet typical learning style and community preferences. These results have implications for multi-campus delivery of courses by a single instructor, an important element of course delivery in rural states.

064

Evaluating Micro Expressions in Agriculture Students Discussing Diversity

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The demand for multicultural and culturally competent employees is greater today than before. With the changing demographics of the population, the cultural gap between students in agriculture colleges and the varied environments they may work in must close. Framed in the context of racial identity development theory, this work postulates that students in agriculture are in the first phase of their racial identity and need to work on moving their awareness to work in a global society. Through sound pedagogy, faculty in colleges of agriculture can help provide a curriculum that is diverse in thought to expand students' notions of diversity and inclusion to better prepare them for the future jobs they may hold. Noldus FaceReader© was used to analyze the facial micro expressions of 14 students in agriculture during a lesson on racism and multicultural education as part of their educational program. FaceReader analyzed student emotions throughout the class and the 10-minute discussion that followed the treatment. This innovative approach revealed that students displayed emotional response to the treatment but were not willing to verbalize or share their thoughts as part of the class discussion. With over 200,000 data points collected, results show that students were alert, attentive, and responding emotionally, even if they were not participating in the discussion. Recommendations include interviewing students to gauge their thoughts and knowledge, working

with faculty in colleges of agriculture to measure their comfort teaching about diversity and inclusion, and expanding the sample size in future treatments.

065

Using a University Agriscience Teaching Methods Class to Test a Science Comprehension Model

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The objective of this project was to test a science comprehension model on 8th grade physical science students in Northern New Mexico. It utilized students in an upper division university course preparing secondary agriscience teachers and an Extension and research youth agricultural science center working with an underserved Hispanic population. The model depicts inquiry-based and experiential learning activities to teach the three components of science comprehension: science knowledge, science skills, and reasoning abilities. The university students designed and taught five classes on the hydrologic cycle (n=82 students). The pre-service university students and their lesson impacted learning on the three components. For science knowledge, the 8th grade students averaged 93.63% on a nine-point hydrologic cycle labeling exercise given the day of the lesson and 77.84% on a six-item multiple choice quiz given the day following the lesson. For science skill, students averaged 100% on a three-point exercise preparing 4" pots to test the effects of different watering treatments on corn growth. For reasoning abilities, students averaged 81.34% on a five-point hypothesis statement for the water treatment experiment following a worksheet and criteria communicated by the university students. 96.34% of the youth rated the lesson good or excellent. One NMSU student stated about the experience, *"Being in the classroom today reinforced my passion for students and excited me even more about becoming a teacher. What an awesome class, what an awesome experience."* These results suggest that university students spend more time assisting youth with experimental design and hypothesis development.

067

Using Public Pedagogy to Develop Innovative Application Courses

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Many educators remember the excitement felt as students when a teacher would roll out the cart containing a TV and VCR. We thought, sometimes correctly, it would be an easy day, but now we are on the "other side of the TV," functioning in the role of teacher and know the impact a media clip or video can have on students and their learning outcomes. Public pedagogy, or the instructional methodology which takes current events and pop culture examples from students' contemporary milieu, is an innovative teaching strategy proven to increase student learning. As principles of andragogy and experiential learning, many educators integrate public pedagogy into their courses without knowing the formalized name, but few have created courses focused on public pedagogy as a method to analyze and apply theory. At University of Arkansas and Texas A&M University, two courses were developed as upper-level application courses for agricultural leadership. These courses use public pedagogy including music, movies, sports, politics, art, and poetry to creatively analyze situations and apply leadership theory. The instructors have found students leave the class with the ability to identify abstract theoretical concepts in their every-day lives and are able to engage in critical-thinking when consuming the information. The objectives of this presentation are to describe the process of

developing a course that uses public pedagogy as the structural frame, help participants identify potential sources of public pedagogy for their own courses, provide example assignments, and share summative impact data collected from students.

068

ISSUES 360™: Students Learn How to Engage the Public on Controversial Topics

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Many efforts to better communicate agricultural science to the public focus on "telling the story" of agriculture in hopes that if the public better understands agriculture practices, then they will better appreciate it. However, science communication theories paint a more complex picture, one that highlights engagement over education. Science information is viewed by individuals through filters that include such things as values, beliefs, trust, culture, religion and many others. ISSUES 360™ is a year-long student engagement activity at Purdue University that helps students better understand how science issues can become controversial and how to engage with others on these subjects. This transformational learning experience is not a class, but a weekend retreat and series of monthly meetings that cover topics such as how people perceive science, how news media cover controversial topics, how to listen to others and how to better understand personal biases and beliefs. The program emphasizes "engagement principles" including respect, critical thinking, information literacy, understanding cultures, openness and good communication skills. The culmination of the experience is student presentations of "public engagement" efforts that they have planned. Having just completed four years of practice, the ISSUES 360™ program has received high praise from student participants, indicating that it has helped them become more critical thinkers, more self-aware and better able to engage with those of differing views.

072

Impact of a Summer STEM Program in Enhancing Understanding of Agricultural and Related Sciences

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For the agricultural industry to remain as leading economic engine for the 21st century, institutions of higher education with disciplines in the agricultural and related sciences must seek innovative approaches to increase the interest of high school students. Too few minority and urban high school students aspire to pursue such careers, because they fail to understand how the science, technology, engineering and math (STEM) within the agriculture and related sciences align with their interests and career goals. To address this problem, the College of Agricultural, Consumer and Environmental Sciences at the University of Illinois at Urbana-Champaign developed a set of STEM awareness experiences in partnership with agricultural business and industry, called the Research Apprentice Program (RAP). This program is designed to expose high school students to the agricultural and related sciences by immersing student participants in both academic skill development (math, biology and writing), and team-based STEM projects developed in collaboration with business and industry. Students are challenged with understanding critical issues addressing the food and agricultural system and how each individual business and industry unit seeks to address such problems. Laboratory experiments, problem-solving exercises, and hands-on collaboration with industry professionals are used to engage students. A study of participants between, 2006 -2016, was conducted to

establish the success factors of this STEM program in retaining participants as future students entering the University of Illinois as majors in the agricultural and related sciences. Approximately 62% of students who participated in the summer STEM experience enrolled at the University of Illinois.

073

Using Round Table Discussions to Engage and Inform Students

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The author was assigned to teach Seminar, a required course for all senior agricultural-related majors which addresses contemporary ag issues using student presentations. Absenteeism and negative student evaluations for the course in prior semesters prompted a need for a more engaging approach to relevant issues and student presentation skill development. One of the strategies used to increase engagement for this course was the roundtable discussion. The round table discussion was integrated into the class allowing students to demonstrate their ability to evaluate and discuss current issues in a courteous and cooperative manner. Students were provided the state-level contest manual and assigned to watch a video of the final round of a prior American Farm Bureau Collegiate Discussion. These resources provided an orientation regarding rules, format, criteria for evaluation, and expected attire for the discussion. Five topics from the 2016 contest plus another relevant topic were used. Students randomly selected topics resulting in six discussion groups. Students assigned to the topic had one week to review relevant background information and prepare, and students who were not discussing the topic used the judge's scoring rubric to provide a peer review of each of the week's discussants. After scoring, 10-15 minutes were allowed for questions and discussion. Prior to class dismissal, the topic for the next week was selected, and the process was repeated. Student evaluations indicated more favorable scores than the average for this course/institution in prior semesters. Attendance was also higher. This was one strategy in a course with multiple projects/assignments.

075

Using Digital Storytelling to Assess Outcomes in a Study Abroad Course

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Studies support that classroom techniques, such as creating videos, have been shown to help students gain a deeper perspective into course content. This study used digital storytelling as an assessment of learning outcomes for an undergraduate equine study abroad course in Ireland. Digital storytelling is a form of narrative, told in the first person, usually presented as a short video. The purpose of the study was to 1. Assess if students on this study abroad fulfilled desired learning outcomes related to cultural awareness and cultural worldview, and 2. Identify other outcomes of the students' study abroad experience. The course took place during a three-week trip across Ireland and consisted of a 50% cultural and historical focus and a 50% equine focus. Students (n=16) were required to make a 7-10-minute digital story video detailing their experience. Students were given guided questions, but no specific objectives for the video assignment. Videos were transcribed and thematically analyzed. Prevalent themes of cultural awareness, intercultural difference, and intercultural similarity were found. These themes align with the intended outcomes of cultural worldview, intercultural curiosity, and intercultural empathy. Other emergent themes included personal impact, personal growth, importance of relationships with others, and future career applications. Results supported the conclusion that intended learning outcomes

were achieved, as well as other personal outcomes, such as self-reflection, perspective, and growth. Digital storytelling was a unique and successful method of capturing the variety of outcomes provided by a study abroad experience.

077

A Needs Assessment for Idaho Beef Programming

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The US beef industry has been affected by advancements in technology, policy, and consumer pressures. A needs assessment of Idaho beef producers had not been conducted since 2005, and to effectively serve the Idaho beef industry, the Extension system must stay current in providing appropriate training. The purpose of this study was to identify education needs for Idaho beef producers. A three-round Delphi Method was conducted, using a participant panel of industry professionals, selected from diverse sectors of the Idaho beef industry. The first round of the survey returned 16 topic themes, which included issues related to public land use, financial management, resource stewardship, and reproduction technologies. In round two, participants rated the 16 topics on importance to the industry. Using a seven-point Likert-type scale, 15 of the topics averaged greater than 4.0/7.0 with a SD less than 1.5. Round three identified the most appropriate agency to develop training and education for each topic. University Extension was the top choice for the majority of topics, while the Cattle Association, Check-Off, and private businesses were recommended. Additionally, round three identified the best programming method for each topic, with regional single-day workshop being identified most often as the preferred method. Self-paced online courses and multi-day workshops were also identified. These findings offer valuable information to those agencies capable of delivering programing, training, and education to beef producers. Strategic education for Idaho beef producers should be implemented with these results, and this process should be replicated for other industries in other states.

081

Critical Thinking Styles of International Faculty

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In addition to academic skills, today's college students need reasoning, problem-solving and thinking skills. Therefore, faculty need to understand the importance of those skills for students and themselves. As U.S. faculty collaborate with counterparts in foreign institutions to enhance curricula, teaching, and student learning, knowing more about faculty critical thinking styles should lead to more relevant professional development in international university settings. This project utilized the Critical Thinking Inventory (CTI) to ascertain the critical thinking styles of male and female faculty at King Saud University, Saudi Arabia during five, six-hour intensive workshops on teaching and learning. The CTI is a validated measure of CT style. The 20-item inventory was administered and results were analyzed for separate groups, male and female, which is common in the Kingdom. Higher CTI scores indicate a "seeking information" style and lower scores indicate an "engagement" style. Female KSU faculty indicated on average a slight tendency toward the seeking style. Individually, 14 of the 22 females indicated seeking style and 8 indicated an engaging style of critical thinking. On average, male KSU faculty indicated a slight tendency toward the engaging style, with 21 of the

39 males indicating engaging style and the remaining 18 indicating seeking critical thinking style. As U.S. faculty engage in international programs, faculty Critical Thinking styles can be used to inform activities. Administering the CTI to students would also provide insight into learning needs. Likewise, better understanding of CT style for international faculty and students in the U.S. could enhance teaching and learning.

082

Multi-Disciplinary Approach to Project Development and Design

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Agriculture and Biological Engineering and Equine Science faculty at South Dakota State University created a unique context for problem solving in a Project Development course, spring 2015. The equine faculty member acted as a client, soliciting the students for a compost design solution to managing manure produced each day by two horses. In this presentation, we will highlight our approach to mentoring students through a project development process. Faculty members met at least twice monthly with the students during the design challenge. Teams developed evaluation criteria for the compost design which would meet the needs and limitations of their client while effectively composting manure. Students presented original compost implement designs and completed a retrospective self-evaluation related to their compost- and project development-based knowledge, ability to work in teams, and learning process. Students (n=13 out of 18) completed the online survey responding to each question regarding how they felt prior to the semester and after project completion. Likert-type questions were developed using a scale of 1 (very little/very weak) to 5 (very much/very strong). Students improved numerically in their perceived knowledge of design (2.462 vs 3.846) and composting (2.231 vs. 4.154), ability to compromise (3.615 vs. 4.154) as well as their

knowledge of (2.462 vs. 4.077) and ability to execute (2.692 vs. 4.0) maintenance tasks. Student ability to organize as a cooperative or high performing team improved from 54% to 100%. Students reported an increase in their working topical- and process-based knowledge as a result of this creative design challenge.

083

Using Extension Educators to Facilitate Experiential Learning

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Extension Educators often serve as change agents in their local community and within their state. However, facilitating change can be challenging and there is no guarantee that the community adopts the change. As part of a graduate level course over the Diffusion of Innovations (Planned Change), Agriculture, 4-H, and Learning Child Extension Educators agreed to collaborate with the students to provide authentic experiential learning. Students enrolled in the course were paired then assigned an Extension Educator to collaborate with. Each Extension Educator identified a current problem or challenge within their local community in which they would like to effect change. In partnership with the Extension Educator, each group developed a comprehensive change plan based on Rogers' Diffusion of Innovations. The change plans were designed to be practical working documents that the Extension Educators could use to guide and implement their desired change. The change plans focused on the need for the change, the target audience, the innovation-decision process, attributes of the change, rate of adoption, and diffusion networks. The students' collaboration with the Extension Educators included multiple meetings and interviews with the Extension Educators and stakeholders within the educator's community. Additionally, classroom learning activities were designed to build off the students' change plans.

Upon completion of the change plans, each student group offered to assist with the implementation. The collaboration resulted in a rich learning opportunity for the graduate students and executable change plans for the Extension Educators to use in enhancing their community outreach.

086

Experiential Learning in Animal Science

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Students enrolling in Animal Science programs are increasingly from urban settings. Most students enrolling in animal science aspire to be veterinarians as they enter college, but many change their career goal before graduation. In addition, livestock industries around the country seek graduates with scientific knowledge and animal husbandry skills. Recent graduates from the College of Agriculture and Life Sciences indicated they were engaged in experiential learning as undergrads: research (36%), internships (54%), and student teaching (18%). Graduates reported value in these experiences for securing job offers after graduation (52%, 63%, and 36% rated as very helpful for research, internships, and student teaching, respectively). The College of Agriculture and Life Sciences Senior Survey data indicate students engage with faculty outside of the class room with 27% involved in independent study, 27% in research, 12% in extension/public education, and 20% in teaching assistance. These experiences were rated 3.5 or greater on a 4-point scale for contribution to student growth. It is important to create opportunities for students from various backgrounds to experience the intricacies of livestock production to prepare them for a plethora of career opportunities. Therefore, we sought to explore the faculty-guided experiential learning opportunities in Animal Science at NC State. Extension internships, undergraduate research, teaching assistance, and camp counselors are just a few examples of methods used to engage undergraduate students in livestock production aspects of animal science. Experiential learning reinforces coursework and provides applied educational experiences to broaden animal science students' future directives.

089

Diversity in Higher Education-Awareness to Action

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Learning environments in higher education offer a variety of opportunities in response to changing institutional and educational needs. One such change is the more recent focus on inclusion and calls to make education inclusive. The Liberty Hyde Bailey Scholars Program (BSP) – an integrated learning and leadership community – in the College of Agriculture and Natural Resources at Michigan State University (MSU) was established to foster a diverse learning community where students learn with and from one another while practicing self-directed learning. However, though diversity and inclusion are often forefront in our curriculum, our understanding of students' actual awareness and conceptualizations of diversity is nevertheless limited. To develop our understanding, we conducted a study that collected student voice around diversity, inclusion, values, and identity. In this session, we share the findings of this study and highlight the ways in which the findings encouraged us to be more conscious of our teaching practices and actions more broadly. Using the BSP's experiences critically engaging in and reviewing our own educational practices as an example, we will also support participants as they 1) critically reflect on their own practices, and 2) brainstorm ways to increase their own awareness of diversity in learning environments and move to action. In this session, participants will discover how to integrate this awareness into curriculum, such as syllabi, projects, assessments,

and classroom/program culture and norms. It is our intention that workshop attendees will leave our session feeling comfortable reimagining their own teaching practices on their journey towards inclusive learning environments.

090

What Students Think about Thinking: Perceptions of Thinking Critically

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Critical thinking is at the foundation of formal education, and often a goal of colleges and universities. The agricultural industry is a global network; as students enter the workforce they are challenged with opportunities to examine situations and act on their ability to think critically. To prepare our students for successful careers in agriculture, a variety of critical thinking activities, assignments, and exams were integrated into a college foundations of leadership course. The purpose of this study was to determine students' perceptions of the critical thinking components of the course (N=13). Students responded to a series of questions soliciting their perceptions of the critical thinking activities, assignments, and exams. Students reported mixed feelings regarding the critical thinking components of the class. The open-ended application-based assignments and exams were an unfamiliar change of pace from the standard multiple choice and right or wrong assessments in classrooms today. Because of this, students were apprehensive and overwhelmed by the critical thinking experiences. So much so, that some students became discouraged when they received their grades. The results of this study are not surprising as widespread mandating of standardized testing continues to influence teaching and assessment. In order to ease student anxiety towards critical thinking, it is recommended that these types of assignments be integrated into more courses so expectations to think critically become more common place. Additionally, time during class should be allotted to discuss students' answers and prompt deeper thought when participating in future critical thinking activities and exams.

092

Utilizing Educational Strategies to Identify and Promote Mindset Shifts in Students Abroad in Haiti

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Higher education institutions offer opportunities to enhance individual and communal growth through service-learning study abroad experiences designed to educate students on different subject matters through real world problem solving. To analyze student changes in mindset regarding both their life and awareness of those around them, an assessment tool based off Dweck's theory of Mindset was developed and implemented on an undergraduate agricultural study abroad class that spent the winter of 2016 in Haiti. Mindset addresses an individual's perception of their potential level for success throughout life and how specific experiences can change a student's mindset. The purpose of this study was to identify an assignment based tool educators could use to identify shifts in student mindset because of a service-learning program. The course incorporated a digital story assignment, as part of the course requirement, designed to identify themes associated with mindset such as growth of self, the potential for change, and career growth. This study provides an example of the educational significance, for instructors, of assessing student mindsets through digital stories to better analyze student classroom comprehension, engagement, and application. The study found preliminary themes of growth related mindsets in addition to cognitive and emotional transformational cues from fixed logic towards growth and exploration of self. This assignment may allow professors to analyze if course objectives are met and improve the overall classroom learning experience.

093

Challenge Accepted: Illustrating Leadership Application in Infographics

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Engaging students in critical thinking can be difficult. Designing activities that foster students' critical thinking is equally challenging. However, students must learn to think critically to be successful post-graduation. To that end, an innovative assignment was developed and implemented in a Foundations of Leadership in Ag and Life Sciences course. Students designed an infographic depicting a leadership theory or concept applied in the context of a complex agricultural problem. Use of the online program Piktochart, or similar design programs, was encouraged. Following the initial submission, feedback was provided along with the option to revise and resubmit. Select students were invited to participate in focus groups to better understand their perceptions of the assignment. Group one consisted of students who performed above average on their initial submission (n=6), while Group two performed below average (n=7). Themes emerged including: 1) Need for clear instructions, 2) Frustration with ambiguity, 3) Willingness to attempt a creative assignment. Overall, students valued the assignment and recommended maintaining it with minor revisions. Importantly, students acknowledged that this assignment was different and more challenging than traditional assignments they are accustomed to completing. The variety of ways to complete the work coupled with the lack of a clear "correct" response was confounding and frustrating. However, persistence in ambiguous situations, analysis of multiple potential solutions, and implementation and evaluation of solutions are precisely the skills students should develop and apply. More frequent use of similar challenging assignments is recommended to improve students' critical thinking.

094

Animals Help Reduce Communication Anxiety: Which is "Best"—Fur, Feathers, or Scales?

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Interacting with animals can build critical life skills. Studies have reported positive benefits of children reading aloud to dogs, while handling reptiles reduced communication anxiety in college students. Little is known about how domestic animal interaction could reduce communication-related anxieties in students prior to entering college. The objectives of this study were to (1) identify how domestic animals can potentially reduce communication anxiety in youth preparing to deliver a presentation and (2) describe characteristics of animals which are most effective at reducing anxiety. Semi-structured interviews were held with 4-H youth who participated in a public speaking competition prior to being interviewed. While preparing for the competition, extension professionals encouraged youth to safely interact with a small dog, rabbit, parakeet, and turtle over several weeks of practice. Findings revealed that the dog and rabbit were preferred by youth for reducing communication anxiety, whereas interacting with the turtle and bird made youth more nervous. The dog and rabbit provided two-way interaction that increased confidence and enthusiasm for speaking. These results are important for college faculty teaching students pursuing careers educating youth. To reduce the communication anxiety of youth, faculty should consider allowing students to safely interact with animals, especially dogs, while studying positive youth development methods. This could involve an instructor bringing a dog to class or identifying a location for students to practice presentations in the presence of a dog. Modeling positive interaction with animals may enhance college students' own use of animals with youth as future educators themselves.

095

Promoting Student Learning via Automated Individualized Feedback

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Students can benefit from individually tailored feedback about their performance, which increases their success in a course. However, in high student: faculty ratio courses, it is challenging to provide each student with detailed feedback and guidance on improvement strategies. The objectives were to develop and evaluate an analytical tool (SCHOLAR) to capture student performance and provide immediate automated individualized feedback to the student and instructor. Performance data were collected on weekly online quizzes over 2 semesters from students (n=117) enrolled in a sophomore level Reproductive Physiology course at a major land grant university. A list of course concepts were developed and individual quiz questions were linked to specific concepts as well as ranked as low, medium or high cognition according to Bloom's taxonomy. Following completion of each quiz, students received an individual report from SCHOLAR to identify deficiencies in specific concepts and level of cognition. Student participation was correlated to the quiz outcome and ability to engage in higher-level thinking. Results from the 2 semesters were analyzed by ANOVA and significant differences were determined by $p<0.05$. Student participation on online quizzes averaged 82% for the 13 quizzes per semester. Students missed more ($p<0.05$) high and medium cognition questions compared to low cognition questions (low 14.1%, medium 23.9%, high 39.9% missed, respectively). As the semester progressed, students improved their ability to successfully answer the higher level of cognition questions ($p=0.0047$). Incorporation of the SCHOLAR program facilitated monitoring of individual student progress to promote student learning and comprehension of the course information.

097

INnovation in Evaluating the Academic Efforts of Faculty Members

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What does it mean to be a faculty member with a substantial teaching load? How do we document and communicate all that we do as teachers and advisors to higher administration for evaluation purposes? Methods used at many universities to document and evaluate efforts are often limited to a list and total number of advisees, a list of courses taught and the accompanying student evaluations, and a space for "other academic." Evaluation by department heads is often merely a consideration of teaching load and review of evaluations. In 2016-2017, faculty in the Department of Horticultural Sciences at NC State University developed a proposal to rework the Faculty Evaluation Guidelines for Teaching to more accurately encompass various teaching, advising, and professional development efforts. Recommendations include reporting some of the following items on annual reports: attending teaching or advising seminars or workshops, participation in a project or conference specific to the scholarship of teaching and learning or advising, being nominated for or receiving a teaching or advising award, developing a teaching portfolio, or participating in the peer review process. This presentation will provide detailed information on the development of the proposal, the recommended changes to be included, discuss the challenges associated with such a tool; and hopefully will encourage session attendees to engage in conversations, both at the conference and at their respective institutions as to how to better document, report, and evaluate teaching.

098

Undergraduates' Understanding of Agricultural Impacts on Wildlife: A Case for Wildlife Conservation Education

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Agricultural production is considered a leading driver of declines in wildlife populations and is outpacing current conservation efforts. Educating future land managers about agriculture's relative threat to biodiversity will likely be required to help restore and maintain wildlife populations. University students enrolled in agriculture-based majors will likely be future leaders in the agricultural industry, however, we have a limited understanding of the knowledge and perceptions our future agricultural leaders have towards contemporary wildlife-conservation issues. College students from an agriculture program at a land grant university in the Midwest (USA), were given an online survey that assessed how they understand wildlife conservation related issues, and how agriculture may contribute to habitat loss for wildlife. Sample respondents felt that habitat loss is a major contributor to wildlife population declines, however there was a difference in department-specific responses in college of agriculture for the questions about agricultures contribution to declines in wildlife populations. There was also a difference between students with previous coursework related to wildlife conservation and those that had not taken wildlife related course. The observed differences in this study revealed that those with majors related to natural resources management and previous exposure to wildlife related classes were more likely to understand the impact that agriculture has on wildlife conservation. For these reasons, we suggest that all students graduating from the agriculture colleges, be required to take at least one course pertaining to wildlife conservation.

102

Examining the Impact of College-Level Agricultural Mechanical Courses

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Because of a lack of appropriate training, teacher effectiveness can be detrimental to the educational process. Agricultural mechanical competence among agricultural educators continues to be an important topic within the profession as it pertains to teacher preparation programs supplying competent educators. This study sought to examine the impact of college-level agricultural mechanical courses on teacher agricultural mechanical competence. Specifically, the study intended to answer the question: what were the agricultural mechanical competencies of participants before entering college and exiting college? The target population was secondary agricultural education teachers in Northeast Texas during the 2015-2016 school year (N=700) and 150 were randomly selected (n=150). The questionnaire focused on assessing 10 agricultural mechanical competencies based on a 4-point Likert scale: 1.00 -1.50=no skills, 1.51-2.50=minimal skills, 2.51-3.50=basic skills, and 3.51- 4.00=advanced skills. Entering college, respondents showed minimal skills (M=1.93, SD=1.68) in eight competencies (structures, cold metal, concrete, electrical, metal fabrication, plumbing, small engines, welding), basic skills (M=2.37, SD=0.84) in woodworking and no skills (M=1.46, SD=0.75) in hydraulics. Exiting college, respondents showed basic skills (M=2.73, SD=0.83) in six competencies (structures, cold metal, electrical, metal fabrication, plumbing, welding), and minimal skills (M= 2.23, SD=0.86) in four competencies (concrete, electrical, hydraulics, small engines). Based on the findings, teacher preparation programs should encourage preservice educators to take agricultural mechanical courses early and often in their college matriculation so that competency can be developed.

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Agriculture Teachers of Texas: Who Will Stay and Who Will Go?

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This study focused on the factors that affect the retention of agriculture teachers in the state of Texas. Results of the study concluded that the key reasons agriculture teachers are staying in the teaching profession revolve around job satisfaction, and student and FFA organization success. Identifying the reasons agriculture teachers are considering leaving the profession is important to teacher educators, agriculture teachers, and school administration to better prepare teachers with professional development in those critical need areas. Descriptive statistics were used to identify various reasons for agriculture teachers' consideration to leave the profession. Online questionnaires were distributed to 330 agriculture teachers in Texas addressing three important questions. The first question addressed what aspects current agriculture teachers felt first-year agriculture teachers were lacking to be effective teachers. The second question asked what aspects of teaching affected their consideration to leave the profession. Thirdly, all participants were asked what aspects of teaching affected their decision to remain in the teaching profession. Results of the study indicated that the majority of agriculture teachers who considered leaving the profession felt there was too much stress (M=3.88) related to FFA and SAE projects. The study found agriculture teachers stay in the profession because they feel a sense of recognition of their role in advising students (M=3.95). Current teachers indicated that stress/time management (M=4.12) and student discipline (M=4.05) were major issues faced by first y

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Exhibition Experiences and Adult Interactions in Youth Livestock Projects

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Livestock projects enable youth to build valuable life skills while growing their knowledge in a livestock animal species by competing against other livestock exhibitors. Traditionally, livestock projects are meant to provide youth exhibitors with learning experiences through its competitive nature and through the cooperation with adults. While youth-adult interactions in a livestock project are intended to provide positive exhibition experiences for youth, youth-adult interactions can also shape the way youth view competition in their livestock project, and impact the skills that are learned or developed. The purpose of this study was to identify exhibition experiences and adult sources of livestock knowledge of livestock project exhibitors and to explain how those factors shape youth exhibitor's view of competition and exhibition motives. A survey was administered to youth livestock exhibitors (N=159) who were enrolled in a high school agriculture course and who also exhibited a beef, sheep, swine, or goat project. Results indicated that youth exhibitor's parents were the main source of livestock knowledge and skills in their livestock project and the youth perceived adults modeled highly positive behaviors when working with youth in a livestock project. Youth exhibitors also agreed that competition was a driving force behind their motivation to strive for excellence in their livestock project and viewed competition in livestock exhibition to be a positive event. Assessing the interaction youth have with their adult mentor in their livestock project could allow adults and educators to better understand youth exhibitor's beliefs and views of their livestock project.

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Perspectives of Teaching from a Land-Grant Universities' College of Agriculture and Life Sciences

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This study explored the educational outcomes of a three-year cohort program that supports the development of pedagogical skills in PhD students in the College of Agriculture and Life Sciences at a Land-Grant University. From the data analysis, the emergent theme: Faculty and Administrators' Perspectives of the Role and Importance of Teaching. Sub-themes include: Teaching Has Not Been Historically Valued; Faculty Felt Ill Prepared for Teaching Responsibilities; and, Acknowledgement that Bad Teaching is a Detriment. While not surprising on its own, this theme contrasted with data that revealed an emerging sub-theme emphasis that (Good) Teaching is a Fundamental Mission of the University. Interviews and focus-groups were conducted with current program participants, the Scholars (n=5), program alumni (n=5), faculty mentors (n=4*), and administrators (n=5*), the asterisk represents one individual who served in both roles. As an emergent theme, further analysis is required, to understand perspectives from individuals who have not been a part of the teaching preparation program. One recommendation from these findings is the need to examine the perceived change in teaching emphasis and strategies to address this emphasis within the continued conflicting messages from some that teaching is still not valued.

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Teaching on a Swivl: Integrating Technology to Foster Engaged Learning

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General chemistry is often viewed as a barrier for a variety of STEM majors from allied health to agronomy. Faculty often look to innovative pedagogy to eliminate perceived or actual barriers to student learning and cultivate cognitive capabilities, critical thinking and quantitative reasoning skills. Advances in e-learning technology and digital media have allowed faculty to move away from traditional classroom pedagogies and provide students with on-demand learning opportunities. For example, faculty who adopt a "flipped" classroom approach creates digital content (e.g. videos) that students view outside of class allowing for experiential learning activities and course embedded research during valuable class time. This study evaluated the use of a Swivl video system and pencasts using a Livescribe smart pen in a general chemistry course to give students on-demand access to digital resources captured during and after class. Survey data collected indicated that students (n=25 out of 25) overwhelmingly (>76%) found the digital content useful or extremely useful. Students noted that the Swivl videos allowed them to identify gaps in their notes, revisit in-class instruction and improve study skills. Students also found pencasts created with a Livescribe smart pen were helpful in developing skills necessary to approach difficult problem sets and receiving prompt answers from the instructor for complex questions over email. Overall 92% of the students agreed that the learning experience was enhanced using technology. Digital resources that capture classroom activities in real time and require minimal production provide powerful opportunities for improved student engagement and learning.

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Cell Phone-based Response Systems: Impacts on Student Achievement

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Classroom response systems, such as iClicker, have been widely employed in efforts to improve teaching and learning during lectures. Cell phone-based personal response systems (CPPRS) offer an alternative tool to iClicker, allowing internet-connected phones to serve as learning tools. We explored the impact of using CPPRS on students' achievement in an upper-level undergraduate Food Science class, and stu-dents' perceptions of using CPPRS. In this study, students used CPPRS to respond to two multiple-choice questions (a) as review of prior lectures at the beginning of the class, (b) at the midpoint of lecture for immediate course content, and (c) at the end of lecture for summary of class content. Students' achievement was measured by correct rates on four 10-item multiple choice quizzes cov-ering content learned either with or without the use of CPPRS. The average correctness of the quiz covering content delivered with CPPRS (89%) was significantly higher than that delivered without CPPRS (80%) (p=0.016). At the end of the semester, a survey was conducted to assess students' perceptions of the impact of CPPRS on learning, the ease of use of CPPRS, classroom distractions, and drivers of use of social media during class. Based on these self-reported survey results, 82% of the participants believed that us-ing CPPRS improved their learning. Used properly, CPPRS facilitated students' learning through engagement in a Food Science course.

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Plickers! Rotate, Raise and Scan a Card

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The lecture format in education has been criti-cized because of the passive role of students and the lack of student-teacher interaction. To remedy this, teachers have started to implement an emerging technology known as Classroom Response Systems (CRS). This system encourages peer-to-peer interactions, as well as providing an assessment to the instructor of any misconceptions of the principles being taught. Plickers is a CRS that requires no special equipment or software, just the use of a smart phone and printed cards. The effectiveness of Plickers was studied in two agricultural classes: Animal Health and Disease Control and Reproduction in Farm Animals. Seventy-six undergraduate students were surveyed to determine the ease, efficiency, student engagement and professor interaction when using Plickers. The results based on a 5 point Likert scale indicated that students strongly agreed or agreed that Plickers introduced some interaction into lectures (M=4.71), provided immediate feedback (M=4.77), was easy to use (M=4.83), encouraged ahead of time preparation (M=4.03), identified misunderstood concepts (M=4.67), and improved the student/professor connection (M=4.21). Themes that originated from the study showed that Plickers introduced some fun into lectures, improved information retention, identified misunderstood concepts, helped prepare for exams, boosted self-confidence, and reinforced concepts learned. Indicated by the results of the study and perceptions of students, Plickers would be a recommended CRS to be used in agricultural classroom settings.

connect/develop/achieve

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Team-Based Learning- Friendship, Satisfaction, and Student Retention

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Team-Based Learning (TBL) is a collaborative teaching strategy. In TBL's purest form, students are placed in teams for the semester to pursue a course's academic goals. Once students in a lower-division TBL agribusiness course became team members, it appeared they often developed friendships during the semester and were more satisfied with the course. To test the accuracy of these observations, plus impacts on student retention, students were surveyed using a set of demographic questions and one question from the TBL-Student Assessment Instrument© regarding overall satisfaction with TBL (n=232). Using multiple linear regression, students with a 2.0-2.49 GPA were more satisfied ($p<0.01$), while students with a 3.5-4.0 GPA were less satisfied ($p<0.10$) with TBL compared to students with a 2.5-2.99 GPA (students with a 3.0-3.49 showed no difference). Regardless, students who expected to earn an A ($p<0.001$) or B ($p<0.05$) were more satisfied with TBL compared to those anticipating earning a C. Students who previously had a positive experience with group work were more favorably inclined towards TBL ($p<0.001$). Students with no friend on their team at establishment, but who developed a friendship during the semester, were more satisfied with TBL compared to those who developed no friendship ($p<0.001$). Paired t-tests showed that students who had no friend at team formation, but subsequently developed a friendship, expected retention through degree completion at a higher level compared to those failing to make a friend on their team ($p<0.001$). Apparently, friendships developed through team interactions positively influenced students expected retention at this institution.

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Linking Acquired Skills of College Graduates with Employer Demands

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The objective of this study was to gain a better understanding of the skills most sought after by employers in the agricultural industry, as well as those skills they find most lacking in new hires. A questionnaire was administered to industry representatives attending the Agricultural Career Fair at Illinois State University in September 2016. Results from completed questionnaires (n=18) indicated that the ability to work with others, oral/written communication, and application of knowledge were the most sought-after skills. While respondents found college graduates skilled in staying current in technology and computer applications, critical/analytical thinking and proficiency in a second language were found most lacking. Using these results, faculty and instructors may update classroom content and experiences to develop pedagogy which better enhance the skills most desired by potential employers without sacrificing student education. For example, instructors can encourage improvement with independent and critical thinking skills by providing students course assignments with broadly defined objectives and anticipated outcomes. In providing less instruction for completing assignments, where possible, students are required and allowed to actively conceptualize and evaluate outcomes they feel are relevant. By linking the skills employers find "most important" to how developed employers find those skills in their new hires, we as educators may provide a classroom experience which better prepares students for the highly competitive agricultural industry.

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Self-directed Learning Readiness: Improving Teaching and Learning in Agriculture Education

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Possessing self-directed learning qualities is important to the growth and success of teachers at any instructional level. A teacher helps to cultivate an environment that is conducive to self-directed learning, and that aids individuals and groups of learners. The individual who is highly self-directed in his or her learning is proactive, self-initiating, resourceful – someone who takes the responsibility for learning. Professional learning for teachers is critical to improving teaching and learning. Self-directed learning offers teachers the opportunity of overseeing their own learning and addressing their own professional needs and interests. This study fills a void in the research of Pennsylvania Agriculture Teachers. A census of Pennsylvania secondary agriculture teachers explored the level of self-directedness the teachers possess and their motivation to seek out their own learning, essentially professional development. The Self-Directed Learning Readiness Scale was utilized for evaluating the participant's perception of their skills and attitudes that are associated with self-directedness in learning. The instrument included 58-items with a 5-point scale for responses, ranging from almost always true to almost never true. Findings evidenced a range of Self-directed Learning Readiness scores of the teachers. While the group mean was a score of 229.59, a slightly above average score, the scores ranged from a minimum score of 176 (below average) to a maximum score of 273 (above average). These and additional findings will guide the decision-making process when organizing, planning, and facilitating professional development activities for the agriculture teachers across Pennsylvania.

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Early College Certificate Program at Kailua and Castle High Schools

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Windward Community College (WCC) has built an Early College partnership with Kailua and Castle High Schools by offering a 9 to 10-credit Certificate of Competence in Plant-Food Production and Technology (CO PFPaT). Kailua High School (KHS) has recently built a new science building and offers biological science classes, while Castle High School (CHS) has a strong agriculture-based curriculum. The objective is to stimulate students to take agribioscience classes, and then enter the workforce. The project commenced in Fall 2016 with 12 KHS students taking BOT 160 (3-credit Tropical Plant Identification), BOT 105 (3-credit Ethnobotany), BOT 199 (1-credit Independent Study), and AG 152 (3-credit Orchid Culture). The 5 CHS students took BOT 105 (3 credits), BOT 199 (3 credits), and AG 152 (3 credits). Lectures and lab/field activities are adjusted based on each school's laboratory and field set-ups, availability and learning focus. KHS students studied nutraceutical manufacturing, and were introduced to plant biotechnology. They gained knowledge of and prepared posters on Ethnopharmacognosy and Plant Biotechnology hands-on activities. CHS students cultivated plants and maintained the growth of vegetables and fruit trees on their campus. They presented loi (taro patch) cultivation and imu (open pit) making as part of their portfolios. All students will receive CO PFPaT diplomas in Summer 2017. The CO is a leading pathway certificate for the Board of Regents' Certificate of Achievement in Agripharmatech, which they will earn when they enroll at WCC. This certificate will enable graduates to have better skills for higher paying jobs.

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Understanding Students' Perceptions of Writing and Reflection: Impact of International Experiences

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Few millennials are proficient writers, and many only write at surface levels. Participation in international experiences provides students opportunities to write and reflect on their learning experiences while expanding their knowledge and skillset. This quantitative study used survey methodology to assess students' (n=95) perceptions of their writing abilities. A modified version of Lingwall and Kuehn's media writing self-perception questionnaire was used to compare writing self-perceptions of students who had completed an international experience and students who had not completed an international experience. Overall, there was a consistent positive difference in mean scores for students who participated in an international experience. The Reflective/Revisionist scores indicate how much planning and revision goes into writing with a low number indicating more planning. Self-Efficacy scores convey writers' levels of confidence in their writing skills with a higher score indicating more confidence. Writing Apprehension scores measure the students' levels of anxiety about writing with higher scores indicating higher anxiety. Scores for each category in the order of those with an international experience followed by those without an international experience were Reflective/Revisionist, 1.80, 2.80; Self-Efficacy, 29.30, 27.03; and Writing Apprehension, 4.40, 6.66. Results reveal that either students who self-select to participate in an international experience have positive writing perceptions or the experience leads to positive writing perceptions. Additional research (e.g., assessment of writing perceptions before and after an international experience) could confirm this possibility as no statistical significance was found between the two groups.

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Changing Undergraduate Aspirations for Research and Extension

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The Youth Obesity Undergraduate Research and Extension Fellows program recruits' undergraduate students through the selection of 4-H camp counselors, especially underrepresented minorities and disadvantaged groups, engaging them in research and extension experiential learning to prepare them for the workforce or graduate studies in the agricultural or human sciences. The 36-month project provides students with the skills and knowledge to understand the complexity of the problems in the family and community context and better implement evidence-based approaches to address childhood obesity. Fellows are embedded in the 4-H camp program in Georgia as camp counselors and trained to deliver the Health is Our Pledge (HOP!) class, and collection of activities that are delivered at 4-H Camp. The first cohort of Y.O.U.R.E. Fellows were selected and completed two workshops aimed at preparation and debriefing for the camp experience. The Fellows could submit their IRBs to conduct research during the summer of 2017, and gained the necessary research background to complete the proposals leading to research submission; understanding qualitative and quantitative methods, and comprehensive knowledge to conduct a study in the camp setting. A research evaluation of the HOP! activities and other nutrition and physical activity programs delivered at 4-H Camp has the potential to change the 4-H Camp experience to improve the health of camp participants as well as impact their communities. This presentation will discuss the opportunities and challenges of undergraduate research in an off-campus research environment with students from multiple institutions and disciplines.

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International Education: Students' Perceived Preferences, Barriers, and Benefits

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The University of Arkansas established a campus-wide goal of 25% international program (IP) participation by 2020—when only 3% of Dale Bumpers College of Agricultural, Food and Life Sciences (Bumpers College) students participated in an (IP) prior to 2012. For the past four years, the Bumpers College IP Office has sought to understand student needs to increase IP participation. This study assessed Bumpers College students' perceived benefits and barriers of participating in an IP. Surveys were administered to students (N=1,165) in large enrollment courses in 2016. Participants included 39.9% sophomores, 27.7% juniors, 19.3% seniors, and 13.1% freshman. Students who were interested in an international experience (71.8%) were most interested in IPs in a European country, with Italy being the most selected (n=417). In Asian countries, it was Japan (n=46). In African countries, it was South Africa (n=58). In South America, it was Brazil (n=68) and for North America, it was Mexico (n=25). On a 6-point Likert-type sale, students most identified benefit to participating in an IP was "looks good on a resume" (M=5.46, SD=0.77) and least identified was "increased employability" (M=4.92, SD=1.00); however, all items were between slightly agree and agree. For barriers (on a 6-point scale), "costs to high" (M=4.79, SD=1.12) was the most identified and least identified was "an IP will not have an impact on my future career" (M=2.12, SD=1.21). Additional benefits and barriers will be presented. This data suggests work must continue to offer more affordable IPs at flexible times and help students understand the benefits associated with participating in IPs.

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Using Agricultural Stereotypes in the Media to Prepare Students for Careers in Agriculture

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Stereotypes regarding agriculture and the agricultural community permeate the media. Depictions of agriculture and rural life as downhome, pastoral, simple, or hillbilly project an inaccurate picture of modern agriculture and farming practices to society. Agricultural leaders, educators, and communicators entering the workforce will be tasked with combatting negative perceptions about agriculture and rural life, yet some students are unaware of how stereotypes are formed, the negative impact stereotypes have on society, and what they can do to effect positive change. Curriculum addressing the issue of agricultural stereotypes was introduced into the Experience Agriculture—Study Away course at Texas A&M University. Students in the course discussed the presence of agricultural stereotypes in a variety of media (e.g., country music, cartoons, advertising, social media), and how repeated exposure to stereotypes through media representations impact viewers' beliefs, attitudes, and behaviors toward the subject of those stereotypes. Students also discovered the existence and perpetuation of stereotypes in the classroom, and discussed how judgments were made about other students based on attire, collegiate organization membership, fraternity/sorority affiliation, academic major, geographical background, or other traditional stereotyping characteristics (e.g., race, religion, gender, age). By recognizing stereotypes in agriculture and in society, students are better prepared for interaction with the larger, more globalized populations they will experience in their careers, and to develop the skills needed to understand, communicate with, and relate to those who differ politically, socioeconomically, or religiously in the workplace.

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Significant Learning in an Agricultural Study Away Experience

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The purpose of this study was to determine if Experience Agriculture—Study Away fostered significant learning. Fink's six-part taxonomy—learning how to learn, foundational knowledge, application, integration, human dimension, and caring—provided the constructs for documenting the learning achieved in the study away course. Eleven students completed a qualitative survey of open-ended questions regarding their thoughts and feelings about what they learned. Participants' responses provided evidence of significant learning in all six domains; the greatest indication of significant learning occurred in the human dimension and caring domains. Significant learning in these areas enabled students to interact more effectively with others, which may translate into future career effectiveness. Further research could explore ways to strengthen significant learning in the foundational knowledge, application, integration, and learning how to learn domains.

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Agricultural Externship: Innovating Experiential Curriculum Design

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Experiential learning models serve as an important foundation for numerous reforms in higher education. Described as a valuable model for instructional design, integration of the four-stage experiential learning cycle (concrete experience, reflective observation, abstract conceptualization, and active experimentation) necessitates faculty implementation of activities that engage numerous student learning modalities throughout the curriculum. The purpose of this presentation is to describe how a newly formed Applied Agricultural and Food Studies department designed a Bachelor's degree curriculum around a formalized, semester-long externship experience and the curricular activities that support it. Typically implemented during the fall of the senior year, Morningside College's externship program builds upon a core of academic coursework, career exploration, and deep reflection on personal career interests. Serving as an active experimentation component in the degree program, students engage in the everyday challenges and opportunities found in the agricultural industry. Students further engage academically throughout the experience providing an opportunity for deep reflection and the acquisition of valuable insights that add value to their educational experience. Upon completion of the externship experience, students return to campus for their final semester where they engage in reflection and abstract conceptualization through a culminating capstone course experience. This course provides opportunities for students to engage in teamwork, enrich problem-solving skills, and enhance oral and written communication skills through focused research connecting the externship experience to personal career aspirations. Perceptions from the first group of students completing the externship experience indicate heightened appreciation of the connection between coursework and industry expectations.

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Undergraduate Research in Agriculture: Innovating Student Engagement

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Active learning strategies are becoming increasingly popular in higher education circles. Typically described as educational approaches that enable students to gain a deep understanding through active pursuit of learning outcomes, active learning strategies have shown superior progress on relevant outcomes when compared to traditional teaching methods. One area that has become

quite popular in the agricultural arena is the use of Unmanned Aerial Vehicles (UAVs). Morningside College's Applied Agricultural and Food Studies program] has developed a series of elective courses that prepare students to become commercial UAV pilots through the curricular integration of requisite knowledge and theories using experientially based piloting skills development that can be applied directly to careers in agriculture. The purpose of this presentation is to describe the integration of undergraduate research as an active learning strategy to instill enhanced critical thinking and problem-solving skills around a contextual problem related to the use of UAVs in agriculture. Students developed and implemented a research project under the mentorship of a faculty supervisor and presented their findings to faculty and peers across the institution at the annual undergraduate research symposium. Perceptions from the students' engagement in undergraduate research with UAVs indicated a high level of contextual engagement, enhanced critical thinking and problem-solving skills, as well as an overall enjoyment with the active learning process. Using real world research problems, agriculture faculty can positively assist students in moving from passive observer to active participant, thereby raising the educational impact of their coursework.

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Conceptual Frameworks for Student Learning of Complex Earth Systems

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Engaging students in authentic problem solving concerning agriculture, natural resources, and environmental issues in near surface complex Earth systems involves developing student conceptualization of the Earth as a system. In this study, we reviewed the state of the education research field related to systems thinking in the context of near-surface Earth systems. The purpose of this study was to build on previous syntheses by conducting a configurative review that addresses two research questions: 1) What conceptual frameworks for systems are present in the literature on systems thinking in the context of Earth systems? 2) How are these conceptual frameworks operationalized in research and educational interventions aimed at understanding and supporting systems thinking in the context of Earth systems? Twenty-seven papers met inclusion and exclusion criteria. Content analysis was conducted on each of these papers to identify general characteristics and systems ideas were analyzed using a qualitative approach. Four conceptual frameworks were identified through this analysis: Earth systems perspective (n=5), earth systems thinking skills (n=10), complexity sciences (n=7), and authentic complex earth and environmental systems (n=5). These frameworks can be used to determine potential student learning outcomes and guide instructional design decisions in agricultural, natural resources, and environmental education. This study is, to our knowledge, the first systematic review in this area and allows comparison of new findings with previous work more consistently. It also facilitates strengthening connections with cognitive science and other education research literature related to systems thinking and complex systems.

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Exploring the Intrinsic Motivation of Students in a Sustainable Agriculture Tour Class

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An animal science travel course focused on sustainable animal-based agriculture was developed by Missouri State University, Central Missouri State University, and Northwest Missouri State University. Over 140 students from the three universities participated in four classes held during May 2013, 2014, 2015, and 2016. For two years, a questionnaire based on the Intrinsic Motivation Inventory (IMI) was provided to class participants before and after the trip. The survey included questions related to students' interest and enjoyment, perceived competence, effort and importance, pressure and tension, and value and usefulness of the course. Pre-and post-test results were compared using analysis of variance to assess the impact of the course on intrinsic motivation and confidence in both animal science and social skills. Correlations between IMI responses and student demographics were also evaluated. Student pressure and tension were less and student confidence in social skills was greater after the course for students from all schools. Student interest and enjoyment, perceived competence, and effort and importance associated with the class, as well as student confidence in social skills differed by school. In addition, a school by time interaction existed for students' interest and enjoyment. Older students were more likely to perceive themselves as competent in sustainable agriculture, while female students reported greater confidence in animal science skills than male students. Overall, students enjoyed and valued the course and did not feel pressure during the five-day course.

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Honors Students' Needs: Developing a Process for Faculty Change to Enhance Student Success

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The University of Arkansas established a campus-wide Honors Program for high achieving students in 2002. During that time, colleges could opt in or opt out with participation. The Dale Bumpers College of Agricultural, Food and Life Sciences (Bumpers College) began participating in 2003, offering a 12-credit hour program that was largely comprised of one credit hour courses. These courses did not always meet students' major requirements, but the program has morphed over time. In 2016, an assessment of needs was administered to current students enrolled in the Bumpers College Honors Program to assess student needs to modify the existing program. Electronic surveys were administered to all honors students enrolled (N=149) in the program. A 66% response rate was obtained. At the time of the assessment, 96% of students indicated they planned to complete the Honors Program. Today, this requires students to complete 15 credit hours of honors course work and write a thesis. Students felt more supported by the University Honors College than by the agricultural college, their academic department, or their faculty thesis mentor. Additionally, 56.3% of students felt the university had above average honors course offering as opposed to 24.5% in the agricultural college. As a part of the assessment, students identified levels of support for specific topics. Students noted a lack of support with honors courses available in their academic major, identifying a thesis mentor, and developing a thesis. Based on Bumpers College honors students' needs thesis guidelines

and a timeline were developed, additional major specific courses added, the website expanded, and a peer mentor program was initiated. To better serve faculty required orientation and proposal development/research methods courses were added, additional student forms put in place, and an outstanding thesis mentor award was added.

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How Agricultural Safety and Health Content is being Taught and Assessed in Middle and High Schools

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The overarching goal of this project was to describe the amount and type of agricultural safety and health (ASH) being taught in the middle and high school agriculture classroom. This project was part of a larger descriptive study where 319 agricultural education teachers from across the U.S. responded to how they incorporate ASH content into their classrooms, and what methods are being used for assessment of student knowledge. When asked how they incorporate ASH content into their classrooms, 65.3% (n=139) of teachers responded, *"I incorporate Agricultural Safety and Health (ASH) content into other units, such as welding and livestock handling".* Of the respondents, 18.3% (n=39) taught stand-alone units where ASH is the primary emphasis. Teachers indicated that Agricultural Mechanics, including 'shop safety', was the most common unit to include ASH content (43.3%, n=123), followed by Animal Science (26.4%, n=75), Horticulture/Floriculture (5.3%, n=15), Pesticide Education (4.6%, n=13), and Tractor Safety (4.2%, n=12). To assess student comprehension of ASH content, 73.7% (n=152) agreed or strongly agreed to using formative assessments, and 58.8% (n=120) agreed or strongly agreed to using summative assessment methods. It was estimated by the teachers that they dedicate an average of 13.1% of class contact

time to ASH content. Most teachers (80.3%) agreed or strongly agreed to incorporate more ASH content into their classes if they knew about content (curricula and resources).

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Comparing Student Course Progress for Alternative Advisement Policies

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Colleges and universities are being challenged to meet retention, academic progress, and graduation goals. Higher education state funding is simultaneously trending toward outcomes based funding formulas over traditional enrollment based criteria. These combined forces push institutions toward advisement policies that accelerate student academic progress. Studies/organizations like "15 to Finish" and "Complete College America" urge course load requirements sufficient for graduation within four years. Advocates suggest ending blanket advising practices and substituting multiple pathways aligned to students' chosen programs of study. A complicating issue is students requiring English/mathematics remediation. Institutions traditionally required completion of non-credit courses to raise students up to minimum competency levels required for higher education success. Such courses consume resources that could otherwise be devoted to better prepared students. Alternative advisement policies may accelerate graduation progress while still addressing these deficiencies. This study examines two advisement policies related to semester maximum course loads: allow up to 18 credit hours across numerous disciplines or limit students to 14 or fewer hours with an emphasis on developmental courses. Student progress rates through developmental English and mathematics courses and core agriculture courses revealed progress differences. The sample student cohort consisted of over 400 first semester freshmen entering an undergraduate ag-

riculture degree program at a small, open-admission, state university from 2002-2016. Over 45% required remediation. Rates of student progress through required developmental courses and percentages of completion are calculated under the alternative advisement approaches. Subsequent progress in completing four basic agricultural core courses is calculated with projected academic progress differences by policy.

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When Should PowerPoint Presentations be Made Available to Students?

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As a professor, I have wrestled with the simple question of when to share PowerPoint presentations with the students. If I share them in advance of the class the students might skip class or they could use them to take notes during the class; thus, having a more complete set of notes. If I make them available after I teach perhaps students will pay better attention in class and concentrate more on what is being taught. What is a professor to do? The literature doesn't help as there are conflicting answers. The objective of this research was to determine the preference of agricultural students and professors regarding when to distribute the PowerPoint presentations and to identify the benefits and disadvantages of various distributions times. An instrument to assess the students' preference was completed by109 undergraduates from 10 majors in the College of Agriculture and Life Sciences at North Carolina State University. A nationwide sample of 61 university agricultural professors were also surveyed. Sixty-eight percent of the students prefer receiving the PowerPoints in advance while only 23% of the professors distribute the PowerPoints in advance. The students strongly believe learning is enhanced when PowerPoints are distributed in advance. They do not believe they are more likely to skip class or pay less attention in class if they have the PowerPoint in advance.

They believe it will help them focus on what is important and be able to take better notes. The professors do not share these views.

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Advising in a Multicultural Setting

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The number of students coming from all over the world to the US for a quality education is increasing annually. The literature is abundant on the issues facing international students studying abroad, yet there is limited empirical evidence on how to address these issues, particularly as it relates to the advising of graduate students. The observation is problematic when considering the crucial role faculty advisors play in the development of their graduate protégé. This study focused on the impact the advising relationship has on the academic progress of the international students in US educational settings. With the graduate advisor-student relationship being primarily a problem-solving relationship (e.g., conducting research), individualistic problem-solving styles, as measured by the Kirton's Adaption-Innovation (KAI) Inventory, was the central focus in exploring how differences impact productivity within this dyadic relationship. This qualitative research case study describes the characteristics of twenty full-time international graduate students and five faculty advisors with experience in advising international graduate students. Data were collected using 1-hour, semi-structured one-on-one interviews. Characteristics of interest included educational and professional backgrounds, intercultural competency, and preferred style of problem solving as measured by the KAI inventory. Five themes emerged from the findings related to language barriers, cultural differences, interpersonal bonding, constructive guidance, and congruency of problem solving style. Although the findings are not generalizable, they lay the foundation for future research and practice on how universities and faculty advisors can create an inclusive and academically productive environment for international graduate students.

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A Collaborative Workshop for a Food and Nutritional Security Course

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The Food Security Educational Partnership: The Intersection of Sustainability, Hunger, Nutrition and Health is a partnership of three land-grant universities (USDA-NIFA project # 2014-70003-22356). The lead university hosted a curriculum development workshop to develop a food and nutritional security graduate-level course on the intersection of food insecurity, which threatens health, education, and workforce readiness. This interdisciplinary course focuses on students' STEM learning experiences and career skills. A facilitator with expertise in curriculum and faculty development from Texas A&M University's Center for Teaching Excellence guided the discussion of the workshop. The participants worked in smaller groups regarding the learning objectives, topics, and assessment and introduced each other to the larger group. Fifteen faculty members from eight organizations and ten disciplines participated in the workshop and determined the core concepts of the course upon the framework: Nutritional Security; Sustainability; Hunger; and Human Impacts where course content and learning activities are in a distance-learning format. Students would work as teams through experiential learning and student-centered learning approach in formulating and proposing solutions. The assignments included organizing Expert Seminars, conducting a Food Security Local Community Assessment, and developing e-Learning Tools. Overall, faculty agreed the workshop provided participants the opportunity to discuss their ideas and network with others about food security. When asked about barriers, participants were not concerned about the quality of the project result due to fragmented vision, and the interference in collaboration caused by conflict avoidance and competitiveness.

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Got Skills? Perspectives of Agribusiness Graduate Employability

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Informed and knowledgeable graduates in agribusiness are highly sought after and prevailing research suggests that new college graduates are lacking in many employability skills such as communication, leadership, and critical thinking. Employers are key stakeholders for institutions of higher education, and as such, should have their expectations of graduates incorporated into the teaching and preparation of graduates to enter the workforce. A mixed method research design involving surveying and focus group identified perceptions of necessary employability skills amongst agribusiness industry professionals and recent agribusiness graduates. Professionals emphasized the need for graduates to possess a strong work ethic and ability to engage in continuous learning to remain relevant and successful within their industry. Focus groups of recent agribusiness graduates revealed a disconnect between agribusiness employer expectations and what recent graduates have encountered. Graduates discussed the importance of work ethic, continuous learning, and emotional intelligence as necessary for success in the agribusiness industry, as well as the challenges faced in the workplace, including obstacles to advancement that led many to "jump" to another job. In the quest to best prepare graduates for successful entry into the workforce, higher education, employers, and graduates must bridge the gaps that exist in perceptions of what each stakeholder requires for this new paradigm to succeed. There is shared responsibility for employability skill development amongst employers, educators, and graduates themselves. Collaboration must occur to successfully align undergraduate core curriculum to integrate key employability skills, emphasizing experiential and lifelong learning practices.

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Effectiveness of a Discussion-Based Course for Future Faculty

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We explored the influence of gender and nationality (US-born vs. foreign-born) on the effectiveness of the components of a discussion-based course on "Effective Teaching in Internationally Diverse College Classrooms" designed for PhD students in STEM. Data were from in-class surveys from 2013 to 2016 (n=50). Items measured on a Likert-type scale (1 = not at all to 10 = a great deal) included "I learn in this course" (A), and five other items starting with "I learn because of:" followed by "the readings before class" (B1), "the in-class discussions" (class activities modeling discussion; B2), "the guest panels" (a series of instructors sharing experiences and advice with the class; B3), "the microteaching" (end-of-semester project in which students develop and implement a discussion-based lesson plan; B4), "the easy access and use of the course website" (instructor's teaching website with syllabus, materials, pre and post class blogs, and additional resources; B5). Overall score for A, B1, B2, B3, B4, and B5 was 8.6, 7.5, 8.9, 8.5, 8.4, and 7.6, respectively and Spearman correlation between item A and items B1, B2, B3, B4, and B5 was 0.49, 0.67, 0.45, 0.50 and 0.50, respectively (all P<0.001). Differences were detected between US-born women and foreign-born women for in-class discussion (9.33 vs. 8.46, P=0.08) and for the web site (7.27 vs. 8.46, P=0.09). No such effects were observed among men. In-class discussion of pre-class reading assignments, guest panels and microteaching projects were highly effective ways to teach this type of course.

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PhotoVoice as a Pedagogical Tool to Examine Student Understanding

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Journal writing and class discussions can provide meaningful student development regarding complex issues. By incorporating a critical pedagogical framework, instructors can also guide students through self-directed learning using both forms of communication and engagement. However, a deeper level of held meanings exist that go beyond the written or spoken word. Therefore, this presentation demonstrates PhotoVoice as a pedagogical tool. Often used in community-based participatory research, PhotoVoice encourages participants to take photos that illustrate their perception of a given issue, providing an alternative method of voicing their lived experiences, held meanings, and perceptions on a social issue. In spring 2017, two undergraduate service-learning courses (agricultural communication and geography) focused on food culture, sovereignty, and politics. Both challenged students to consider alternative ways to communicate their perceptions with one another and community members. While journaling and group discussions helped to unpack the course objectives, an assigned PhotoVoice project was designed to examine how students: (1) explore politics of food and their respective positions within food systems using photos, and (2) group the class' collective photos into categorical meanings based on each of their own perceived meanings. All student photo groupings were analyzed via statistical software to show clusters of similarity and difference. The results revealed a common area of agreement among all students regarding an issue like food insecurity. But, even further, the results demonstrated three student subgroups that emphasized the importance of narrative development, community impact, and intimate knowledge of people and place – all revealing unique senses of responsibility among students.

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The Nature of Food Waste: A Holistic Extension Program

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Food waste, defined as edible food that is thrown away or discarded, is a growing global issue. United States consumers and retailers waste 30-40% of the food that is produced every year. Once in landfills, food waste affects wildlife, water quality, and contributes to climate change. Despite the breadth of this issue, there are few resources available to teach students about food waste. To address this gap in available resources, a team of Purdue affiliates are developing The Nature of Food Waste, a holistic extension program that includes elementary level lesson plans, a series of one day teacher workshops, a mobile app, and an exhibit all about food waste. The lessons are interdisciplinary, and encourage experiential learning, student collaboration, and reflection. My graduate research involves working with second and fifth grade classrooms in two Indiana schools to evaluate the effectiveness of the lesson plans at improving student knowledge, attitudes, and behavior regarding food waste. I will also evaluate teachers' perceptions of the education and their willingness to incorporate the lessons into their curricula. I will do this by surveying and interviewing students, interviewing teachers, and weighing student food waste in the cafeteria before and after the program. The team of Purdue Extension Educators, faculty, and students hope that this research will show that education is effective at reducing student food waste, and that Indiana elementary teachers will choose to use this program in their classrooms.

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Integrating Stakeholder Input into an Undergraduate Environmental Curriculum

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Collaboration with external stakeholders can provide opportunities for engaged undergraduate learning experiences, and can also be an important facet of career development for undergraduate students. The Environmental Resource Management (ERM) program at Penn State collaborated with the Center for Dirt and Gravel Road Studies, state agencies, and the private sector to develop a unique course and certificate program. The impetus for collaboration was statewide recognition that additional trained personnel are needed to locally implement and administer state programs controlling sediment and nutrient pollution from agricultural systems and rural dirt and gravel roads. The ERM program recognized that this demand created opportunities for relevant, engaged learning experiences for undergraduate students, and that the Rural Road Ecology course and Agricultural Stewardship and Conservation certificate would provide exposure to stakeholders interested in hiring students with experience upon graduation. Goals and learning objectives were achieved by focusing on basic and advanced hydrology, sediment and nutrient transport principles, and applied best management practices used to prevent environmental degradation. Team- and field-based projects with stakeholders were built into the course requirements to reinforce the learning objectives and provide hands-on experience. Student mastery of the learning objectives, in keeping with the University's Land Grant mission, will lead to statewide certification in Environmentally Sensitive Maintenance (ESM) practices, and as agricultural erosion and sediment control and nutrient

management specialists. The ERM program plans to use this model to seek additional opportunities to engage with external stakeholders for the dual benefits of experiential student learning and career development.

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Ethical Viewpoints of Students in a Contemporary Animal Issues Course After Viewing Documentaries

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Ethical treatment of livestock has become a societal and industry concern. Sam Houston State University has incorporated topics like treatment of animals, meat-based diets and human health, and the impact animal agriculture has on the environment into their contemporary animal issues course. Twenty-four graduate students in the fall of 2016 completed pre- and post-surveys polling their ideas on ethics and animal welfare topics discussed in class. After the pre-survey, the class viewed documentaries and engaged in class discussion. Students' responses were recorded individually, divided by gender, and then analyzed using the paired TTEST procedure in SAS. Students were more likely to disagree with the practices portrayed in the veal industry (P<0.01) after viewing the documentary than their original perceptions. After class discussions, students were more likely to believe that whales and dolphins should be treated better and differently than livestock (P<0.05), with an increase in government regulation of animal welfare in the fur industry (P<0.06). Finally, students were more inclined to disagree with use of animals for entertainment purposes (P<0.05) in their post-survey responses. Between genders, females were more likely to disagree with the use of gestation crates (P<0.06) in their post-survey response whereas males did not change from pre-to post-viewpoints. With this shift in opinion, it shows that even agricultural students exposed to this type of documentaries are more likely to soften their original viewpoints.

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Perceptions and Willingness of Pennsylvania Farmers' to Adapt to Climate Change

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In the northeastern region of the United States agriculture is being impacted by climate change in terms of increased storms, precipitation, and heat that hasn't been experienced with such strong fluctuation in decades. Climate change adaptations and mitigation strategies for agriculture exist and are effective, however producers are reluctant to adopt this new technology. In order for adaptations to be adopted it is important to understand what agricultural producer's perspectives on climate change are. An extensive literature review indicates only six empirical studies have been conducted in the Northeast, on farmers' perspectives relative to climate change. As climate change impacts occur globally but are felt and interpreted locally, there is a need to better understand Pennsylvania farmers' perspectives on and willingness to adapt to climate change. This study used focus groups as a methodology to collect information on Pennsylvania producers' viewpoints on climate change. Two focus group sessions were conducted with tree fruit producers and corn/grain growers. Results indicate a difference in how each producer groups experienced climate change impacts. However, producer groups were similar in terms of lack of control towards dealing with mother nature, a hesitancy to believe climate change is the cause of perceived weather changes, and a desire for increased public education. This study is part of a larger study that is using rich descriptions from producers to guide a state-wide survey, designed to understand the perspectives and barriers Pennsylvania farmers must adapt climate smart agriculture.

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Campus Climate: Including Agricultural Identity as a Social Identity

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Campus climate studies continue to be of importance to institutions of higher learning to aid in creating safe, diverse and productive working environments. Prior research suggests different experiences reported by students, faculty and staff by social identities like race, LGBT identity, and others. The purpose of the present study is to consider the inclusion of agricultural identity as a social identity group within campus climate assessments and studies. Three land-grant institutions with 12,600 undergraduate and graduate students enrolled in colleges of agriculture within the United States participated in this exploratory 56-item survey research study. Descriptive statistics were used to report on the salience of agricultural identity as a social identity to respondents. Two analyses were conducted using multivariate analysis of variance: one with the independent variable of agricultural identity as a top three social identity and one with the independent variable of socially ascribed agricultural identity on self-reported success/retention outcomes. Respondents made it clear that agricultural identity is an important social identity with 51% of respondents across the three institutions reporting it within their top three. Statistical significance was noted on similar self-reported retention and success outcomes on each of the multivariate analysis of variance. Namely, respondents' sense of belonging to the college, feeling of fit at the University, and their desire to leave their academic department, college or institution. This study advises that agricultural identity may be a social identity of interest within campus climate studies, specifically at land-grant institutions or other institutions with an agricultural history.

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The Way Eye See It

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When you look at an advertisement in your favorite magazine, where does your eye go? The picture? The text? What is the last thing you see before turning the page? The objective of this study was to identify key elements college-aged consumers viewed in a livestock print advertisement. Twenty-nine participants with minimal or no graphic design experience viewed eight print advertisements, designed by previous students, for five seconds each. Eye-tracking technology was used to determine time to and location of first fixation, final point of fixation, and fixation count. Participants took an average of 0.66 seconds to view the first fixated element and used an additional 3.15 seconds to reach the last fixated element. Participants first fixated area of interest (AOI) was the dominant image, and the final fixated AOI was the contact information on the advertisement. The participants fixated an average of 2.12 times on the dominant element in each advertisement. The data also shows the advertisements containing more color had a higher level of fixations and a more defined gaze pattern. These college-aged consumers were more likely to focus on full-color advertisements than advertisements in black and white. Therefore, future graphic designers should be mindful when including a dominant element in their designs. Also, current designers should understand consumer eye behavior to best market their product or service to college-aged students.

connect/develop/achieve

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An Unexpected Learning Outcome from Student-Family Paired Survey Research

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Adult educational programs aimed at facilitating the transition of the farm to the next generation have grown, and the topic has been added to our curriculum through introduction in existing classes. Planning for farm transition is particularly important as, without significant growth in acres or livestock numbers or addition of value-added activities, farm families must increasingly consider delayed transition and equity to those children who will not return to the farm. A strong majority of students in agricultural programs within the college were raised on a working farm or farmed with relatives during their youth; and still a slight majority plan to eventually return to the farm. As an unintended result of a survey designed to compare conservation attitudes and intentions between students and their farming parents, we discovered a substantial lack of basic understanding of farm structure and organization among students about the farms on which they were raised and those to which they intend to return. This motivated development of exercises including consideration of students' home-farm operations in experiential learning activities, especially for those students who intend to return to the farm. Initial observations are that using home farm or family business entities of students in a class increases interest among students in application of financial evaluation and planning exercises, and can help initiate reasoned discussion between students and their parents or other family members about farm/firm financial health and direction. End of term student surveys will provide quantitative evaluation of this hypothesis. We prefer an oral presentation.

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Experimental Learning Exercise on the Streets of Chinese Cities

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Food safety fundamentals were covered in two agribusiness management classes at Renmin University in Beijing, one designed for agribusiness students and the other for rural development students. Focus of content covered was on identifying sources of food safety risk, measuring scope and degree of risk, and developing mitigation plans, with the latter covering both individual unit mitigation strategies and local policy recommendations. An experiential learning exercise was designed that, following Kolb's pedagogical process components, includes concrete, personal experiences; reflective observation; abstract conceptualization; and active experimentation. Students were assigned to individually observe two street vendors selling food cooked or otherwise prepared in place and identify and rate severity of food safety risk factors. Each student observed unique vendors. In groups of three, students discussed their findings, and identified commonalities and differences. Focusing on the sources of these commonalities and differences, students identified and defined high-impact educational programs aimed at street vendors and policy alternatives for local communities. After the individual and subsequent group reflection processes, student groups presented their results in an oral presentation. After hearing the observations and recommendations of all groups, students reflected individually and then with their group on how the experience of their peers added to their learning and changed their own recommendations. Qualitative comparison between pre- and post-oral presentation reflections demonstrate notable value to reflective activities repeated after gaining additional insight from other groups. We prefer an oral presentation.

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Lessons Learned from a Year of Teaching in China

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There is an overarching focus on education in China as students are prepared for the National Higher Education Entrance Examination, commonly called the Gaokao, a two-day comprehensive exam that is the predominant criteria used to determine eligibility for colleges and universities. It is not surprising therefore that expectations and behaviors of Chinese students entering colleges and universities differ from those of their North American counterparts, who are generally judged for post-secondary admittance more holistically. Our objective was to identify key differences in expectations and behaviors and to recommend teaching strategies that will help Chinese students gain more from our less stringent pedological practices and help those teaching Chinese students who attend North American universities and colleges. Differences were identified from personal observation, interviews with eleven American faculty teaching in China, and from discussions with twenty-four post-secondary Chinese students at Renmin University. Key differences include Chinese students' patience for long straight lecture-style courses, a focus on memorization and structured problem solving, an unwillingness to share diverse points of view orally, and an inherent respect for the teacher and the classroom. Strategies towards overcoming different experiences and expectations between Chinese students and North American instructors include easing into controversial topic discussion through anonymous commenting technology, developing a personal relationship between the instructor and the students, learning about the experiences and goals of students, and providing clear guidance on classroom and learning expectations. Additional strategies will be identified through audience participation during the oral presentation.

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Facebook Live: Advancing the Social Media Toolkit

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Social media has noted benefits in educational settings. Agricultural instructors use social media to deliver content, creating community in both face-to-face and distance education settings. Challenges include real-time interactions, observations, and contextual communications that face-to-face learners receive from the instructor but distance learners may miss, which may create inconsistency between learning environments. Similarly, face-to-face learners miss out on the asynchronous benefits of distance learning. Enter Facebook Live, a social media content streaming tool. The purpose of this innovative teaching technique is to bridge the potential consistency gap between face-to-face and distance learning environments. We used Facebook Live in a split-section hybrid-delivery agricultural communications course (one section was distance (n=42), one section was face-to-face (n=35)) to record and stream important information about assignments and expectations. Distance education students engaged in real time via the comment section or, once the live feed ended, the video remained accessible, allowing for asynchronous learners to watch or for repeat viewing. Distance learners use the comment section to engage and interact, thus maintaining consistency of environment with face-to-face learners, who interact in the classroom. Distance learners reported an environment with enhanced inclusivity, community, and positive learning outcomes including increased retention and efficacy in theoretical foundations. Research should investigate the impact of Facebook Live on academic performance, content mastery, engagement, and other subsets of teaching and learning. Practitioners in

other disciplines should implement Facebook Live as an enhanced delivery tool. Diffusion of this innovation could meet demand for inclusive and interactive educational environments in agricultural higher education.

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Improving Teaching Through Peer Review: INnovation of Process

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Ask a faculty member about peer review and they may react in several ways: exasperated eye roll, trepidation, apathy, or excitement. Some may consider it to be nothing more than a requirement for promotion and tenure. When done correctly, peer review serves to improve the teaching ability of all parties involved. But what constitutes "correctly?" The answer straddles the realms of teaching, promotion & tenure, and administration. A thorough and constructive review should indeed improve teaching, but a good peer review takes substantial time. That time and effort should be documented for the reviewer in their own evaluation. Peer review criteria/content should be consistent across faculty and over time to aid administration in evaluating performance used for promotion and tenure. The Department of Horticultural Sciences analyzed their peer review process in 2016 and discovered it wasn't working well. Despite agreement that peer review was valuable, a survey revealed the faculty were unsure how to properly conduct a constructive review. They also felt frustrated by the wide variation of time invested in the process. Personality conflicts abounded and administration had a difficult time reconciling inconsistent reports. Months were spent, first reworking tools of the process and then the entire process. Once a suitable process was formulated, it was fine-tuned by additional faculty. The process was then piloted in Horticultural Sciences, as well as other departments across the college. This session will present the epiphanies and challenges of this retooled peer review process and strategies for implementation.

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Importance of Agricultural Renewable Energy Curriculum Topics

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The rationale for this study was that Kentucky high agriculture students were scoring very low on the state agriculture mechanics' skills test in the area of alternative energy. The researchers wanted to investigate this problem to determine potential causes for the low performance. Alternative energy is a relatively "new" subject in the agricultural mechanics' curriculum. Teacher familiarity with the subject and curriculum resources availability could impact the instruction of this topic. The objectives of this study were to establish the importance of agricultural renewable energy as a curriculum topic, determine the topics of relevance, and to ascertain the amount of instructional time that would be devoted to such topics as perceived by Kentucky secondary agriculture instructors. One hundred and fifty-six secondary agriculture teachers were surveyed and their responses were coded and subjected to statistical analysis. Descriptive statistics were utilized to describe the demographics of the sample surveyed such as teaching experience, age, gender, and the school's urbanicity. A multivariate analysis of variance was used to determine if any significant difference existed between dichotomous subgroups of the sample in the rank order of alternative energy topics. Pertinent findings based on the data were the following. Agricultural renewable energy was very important for inclusion into the secondary curriculum. Teachers would dedicate up to nine class periods of instructional time. Six renewable energy topics were ranked for selection into the curriculum. An outcome of this study will be the development of agricultural renewable energy instructional units to distribute to agriculture teachers.

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Identifying Critical Plant Science Skills: An Industry Survey Approach

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Students from a wide array of plant science fields take a plant pathology course at some point in their academic careers, and most rely on a single introductory undergraduate course to provide them with the essential skills and knowledge they will need to understand and manage plant diseases. Designing and evaluating introductory undergraduate courses for this diverse population can be challenging, and content may be based more on individual instructors' expertise or the content of the previous instructor than on solid knowledge of the needs and expectations of the students' future employers. The objective of this work was to assess employer expectations of BS-degreed graduates in plant sciences who had taken an introductory course in plant pathology, and to identify skills that they considered critical for all plant science students. A second objective was to compare these employer needs and expectations to results of an instructor survey to identify gaps in course and curriculum content. Instructors placed greater value than employers on the disease cycle, pathogen resistance, and fungal pathogen structure and biology, while employers placed greater value than instructors on bacterial taxonomy and identification, sight recognition of nutrient deficiencies and mite problems, nematode identification, DNA extraction, and media preparation. Employers indicated that employees with plant science related degrees are often lacking in basic lab skills, writing skills, and statistics competency. Results of this survey will guide future course and curriculum development in plant pathology, and the survey may be readily adapted for use in other disciplines within plant science.

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Building a 21st Century Outcome-Based Insect Biology Curriculum

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In 2016, The Department of Entomology at Purdue University completed a comprehensive review and revision of our Insect Biology curriculum. Our revision process focused on the question, *"What should students to be able to do when they leave our program?"*, instead of *"What should they know?"* This shift in focus led us to explore and define discipline-specific outcomes. Development of discipline-specific outcomes allowed us to evaluate our curriculum and courses for deficiencies, and conceptualize what new and revised courses are necessary to accomplish discipline-specific goals. We adopted "Grand Challenges" as a narrative to connect future students to the relevance and significance of the Insect Biology major. The idea that Insect Biologists tackle Grand Challenges became an integral part of our redesign process, eventually book-ending the entire curriculum with two single-credit courses. These two courses first introduce students to relevant societal grand challenges and then revisit those challenges four years later so students can investigate how they may apply knowledge and skills they have acquired to solve larger societal problems. The result of our process is an applied biology curriculum that meets the constraints of State, University and College requirements, is grounded in the STEM disciplines, incorporates mentored experiential and reflective learning and is designed to prepare students to enter and lead a 21st century workforce.

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Current Events Articles Enhance Student Learning in Undergraduate Genetics

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Many students in undergraduate genetics courses have difficulty relating concepts taught in class to real-world agricultural applications. The objective of this study was to determine if incorporating a current events assignment improved student learning in an undergraduate genetics class. In fall of 2013 (F13, n=130), students were asked to write 5 papers that could be submitted at any time and could be related to any species. Even though this is an agricultural genetics class, the topic of most papers was humans. In addition, students overwhelmingly waited until the last week to turn in all the papers. In spring 2015 (S15, n=139), students wrote 4 papers with due dates evenly distributed through the semester that had to apply to crops, livestock, companion animals or exotic animals (not humans). Improvement from pre-test to post-test for each of 4 units of the class was calculated as a measure of student learning. In units 1, 3, and 4, students improved more in S15 than F13 (P<0.01). For unit 2, students improved slightly more in F13 than S15 (P=0.05). The average for improvement from pre-test to post-test over all 4 units was greater in S15 than F13 (P<0.01). Student learning seemed to be enhanced by having papers due throughout the semester. Additionally, applying the concepts from class to a news article on a crop or animal species may have helped relate the content to their other classes and the larger curriculum, resulting in increased learning.

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Competency-Based Learning: An Investigation by a Committee at a Land Grant University

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Considerable confusion exists in the definitions of Competency Based Education (CBE) and its potential for application at Land Grant Institutions. Outcomes-based, performance-based, active, personalized, and adaptive learning are all frequently used expressions for what may be a part of the instructional approach in a program. An ad hoc Senate committee was charged to investigate the validity and relevancy of CBE for our institution. Our charge was to study whether to recommend that the University take the necessary steps to begin offering academic credit for competency-based education. The committee was further charged to issue a final report to include identification of specific degree programs that would appropriately be served by a CBE option or determine to recommendation not to pursue CBE at this time. The group met biweekly to conduct its work. Members interviewed individuals on and off campus and shared materials electronically through a Sharepoint site. The committee distinguished between the theoretical or teaching-focused goals of determining what students know and can do from the institutional structures and processes that support alternatives to traditional classroom-based, credit hour driven credentialing. We note that many of the goals associated with CBE–serving diverse populations of students in a flexible manner, providing employers with evidence of skills acquired and enhancing the revenue streams for higher education– are achievable through hybrids or other means of instruction like online courses rather than uniquely requiring CBE programs. Since our charge specifically asked for recommendations about "offering academic credit for CBE," we set aside alternative credit opportunities, like non-academic

certificates, digital badges, or recognizing competencies demonstrated through ePortfolios. We found little evidence that institutions like ours are engaged in successful CBE programs, though many appear to be considering it in the same way that the formation of this committee might be reported as evidence of "considering." Finally, we found many challenges to CBE, especially the purest form of CBE that relies on direct assessment. Our approach and findings could be of value to other Land Grant Institutions.

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Current Event Video Assignments in an Undergraduate Genetics Course

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Undergraduate genetics is often cited as a difficult course, and incorporation of team-based learning activities may help enhance student learning, retention, and critical thinking. To further these goals, students in an undergraduate agricultural genetics course (n=154) were tasked with creating a video based on a current news article that explained the information in the article and the underlying scientific concept in a creative way. They could choose their own group members and any news article published in the last year that incorporated a genetics topic. Videos were viewed the last week of class and students were surveyed on their perceptions of the assignment after viewing the videos and completing peer-evaluations. When asked to rate how useful the videos were in learning and reinforcing concepts from class, 44% of students rated the videos 4 or higher out of 5. Approximately 56% of students rated the amount learned from making their own group's video at 8 or greater out of 10 (18.7% rated a 10/10), and approximately 60% of students rated the amount they learned from watching other group's videos at 8 or greater out of 10 (22.8% rated a 10/10). When asked to rate how much fun the video was to make on a scale of 1-10, approximately 58% of students scored it an 8 or higher (26.7% rated 10/10, 5.2% rated

1/10). These results indicate that perceived learning from completing these activities was moderate to high, and that most students enjoyed completing the assignment and watching the videos.

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Improving Student Success While Attending a Professional Conference

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National scientific conferences can provide many professional, academic, and social opportunities for undergraduate students. However, students rarely attend such conferences as undergraduates. Of those who do attend, students often express anxiety associated with presenting research, with networking, or with unfamiliarity with the academic environment. To address these concerns, we developed a formal undergraduate course aimed at helping students optimize the experience of attending The Wildlife Society Annual Conference in 2014 and 2016. Prior to the conference, we held several class sessions to discuss expectations and preparation for the upcoming meeting. Assignments included identifying presentations of interest, creating a personalized schedule, and identifying conference attendees to meet. During the conference, we met daily with the students to discuss students' experiences during that day. Ten assignments during the meeting included networking, asking questions during talks, and attending working group meetings, among others. After the conference, we conducted one additional class for students to reflect on their experiences and to submit a reflective essay. Student feedback was positive and indicated that student experiences were enhanced through enrollment in the course. Assessment results indicated that students made significant progress in professional, academic and social abilities, and many expressed interest in attending fu-

ture meetings. Survey results indicated an increase in students' interest in attending graduate school as well as an increased appreciation for the value of wildlife experience. We conclude that formal preparation for attendance at a national scientific meeting maximizes the potential for students to benefit from their experience.

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Student Perception of Learning and the Link to Student Learning Outcomes of a Course

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Instructors of courses purposefully construct student learning outcomes based on the material that is presented during the semester. Traditional assessment methods in the form of assignments and exams provide feedback to the student and instructor as to whether those student learning outcomes are being met. Anecdotally, students fail to acknowledge the link between assessment tools and the learning outcomes of the course. Students often ignore learning outcomes of a course and focus solely on content and assessment success. Other than assessment scores, instructors lack the means to determine if the student learning outcomes are being met. To begin evaluating the efficacy of students' perception of achieving the learning outcomes of a course, students (n=683) enrolled in an introduction to animal science course were given the option to complete a survey. Students were evaluated through pre- and post-course assessments to determine what their perceived level of achievement of student learning outcomes was, based on a scale where 1 = not at all and 10 = expert level. Each of the 9 statements were linked to one of three student learning outcomes, based on acquisition of knowledge, comprehension and application. Results indicate that students significantly increased (P<0.05) their perceived ability to meet all student learning outcomes from the beginning of the course (3.46) compared to the

end of the course (8.83). Considering students' perception of learning should be considered when designing the content of a course and can provide a means to assess student learning outcomes.

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Perceived Learning Gains of Natural Resource Students in an Undergraduate Research Program

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The main priority of a college of agriculture should be to provide high quality learning experiences to students. Repeatedly, undergraduate research experiences (URE) have been recognized as one method to achieve this end. While some studies have proffered the advantages of undergraduate research, recommendations have also suggested more empirical studies should examine the benefits of URE. Therefore, this study examined perceived learning gains of Natural Resource Management students participating in a URE. The sample consisted of all students (N=16) participating during 2015 and 2016 in the Borderlands Research Institute URE at Sul Ross State University. The Survey of Undergraduate Research Experiences was administered, which contained 21 Likert-type items measuring research learning gains; responses ranged from 1 (no gain) to 5 (very large gains). All participants reported large/very large gains for eight items regarding scientific literacy skills including, understanding the research process, research literature, scientific work, integrating theory/practice, as well as learning to work independently. While most participants reported large/very large gains for all items, the lowest gains were realized in time management, academic writing, presenting orally, interpreting results, multi-tasking, and ethical conduct of research. For most participants (62.5%), this was their first URE; the majority (93.75%) reported high levels of enjoyment of the research process, while all indicated that the URE added extra value to their college education. This study

provided a snapshot of students' perceptions of research learning gains after their URE, therefore, future studies might longitudinally examine students to determine how learning gains develop over time.

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Students Act as Tour Guides for a Study Abroad Class

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Fifteen University of Arkansas students participated in a Human and Animal Interactions study abroad trip to Australia and New Zealand. As a way of engaging students prior to the trip, they were given 'tour guide' assignments. Students were asked to research and compile a two-page bulleted informational sheet with five high-quality resources. Tour guide assignments could be over a variety of topics from a city they were going to visit to ways of managing a specific livestock species in Australasia. The completed reports were made available to the class prior to departure. While the group was overseas, students acted as the tour guides and assumed the role as content experts. The tour guide assignments and in country activities were directly related to the course objectives. At the end of the trip, students were asked to rate themselves on a 1-10 Likert Scale (1 = lowest; 10=highest) on their knowledge of 13 course objectives before and after they participated in the study abroad class. On all 13 objectives, a statistically significant gain in knowledge was obtained. All 15 students reported that because of this trip they had grown academically, personally and professionally and that they were more likely to study abroad in the future. Additionally, 14 reported that the trip influenced their plans for the future.

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Meet the Grand Challenges: Undergraduates Embrace Land Grant Mission

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The future success in the field of food and agriculture is predicated upon the cultivation of young scholars to be nimble, strategic, and innovative thinkers. The United States Department of Agriculture has established priority areas or 'grand challenges' such as hunger/food security, sustainable energy, childhood obesity, climate change, and food safety. This presentation will introduce an innovative approach to preparing current students at South Dakota State University to 'Meet the Grand Challenges'. Join us as we demonstrate our approach to preparing students to meet the grant challenges, built upon the teaching, discovery, and outreach services of the land grant mission. Innovative honors curriculum and research opportunities enriched the student experience related to the grand challenges. Additionally, students participated in a service-learning program offered in partnership with SDSU Extension and the Boys & Girls Clubs in Eastern South Dakota. The goal of this program was to engage college students in educating youth about the importance of agriculture, nutrition and physical activity to inspire youth participants to develop capacity for meeting these grand challenges. College students offered experiential learning impact programs, which included sustainable agriculture through personal gardening, the relationship of food and culture, food choices, and nutrition through cooking, and the benefits of

physical activity through yoga. Assessment of participant knowledge revealed growth in all three targeted areas. While these collegiate experiences are transient, the awareness, knowledge and capacity for change have the potential to last.

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Integrating Biomimicry in an Undergraduate Leadership Course

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The general applicability of the knowledge, skills, and abilities taught within a leadership major expands a student's options for employment and/or further education after graduation. By intentionally facilitating connections between science and leadership, students are presented with opportunities to develop skills and competencies needed to think critically and solve problems in new and innovative ways. Biomimicry is one innovative way to integrate knowledge across disciplines, as it searches for nature-inspired solutions to human challenges. Biomimicry has applications that extend beyond engineering or design. From communication, to collaborative work environments, the natural world is replete with examples of sustainable practices applicable to leadership education. One institution embraced the use of biomimicry to incorporate leadership concepts with naturalistic solutions found in honey bee colonies. With the assistance of professional instructional designers and an expert in the field of biomimicry, paid student interns designed on-line modules linking leadership concepts with honey bee behavior for an introductory leadership course. The modules focused on managing conflict, group decision-making, organizational structure, and organizational culture, along with an overview module defining and introducing biomimicry as a conceptual frame. The modules have been incorporated into the curriculum of a pilot-test section of an undergraduate introductory leadership course. Long-term goals include incorporating principles of biomimicry into other undergraduate agricultural leadership courses, delivered either in-person or on-line, as well as stand-alone leadership trainings. Excerpts from the modules will be shared illustrating how biomimicry can be applied to leadership along with lessons learned from this process.

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Influence of Reflection and Immersion on Students' Views of Cultural Diversity

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International high-impact experiences in agriculture are increasing in number. Myriad research investigates the benefits of such programs, least of which includes enhanced cultural awareness. Recognition of cultural diversity is related to self-efficacy, intercultural communication, and other soft skills. This study describes how international high-impact experiences and purposeful reflection on those experiences influences students' views about cultural diversity. Short-term study abroad participants completed pre- and post-experience reflections (two programs and countries) about cultural identity. Qualitative analyses were used to find shifts in self-reported recognition of cultural diversity. Analyses centered on participants' descriptions of their cultural heritage in relation to the cultural immersion experiences abroad. In pre-departure reflections, few students described the uniqueness of their cultural heritage (an initial step in recognizing cultural diversity), indicating deficient thought about culture. Students wrote about culture objectively, such as race, nationality, and socioeconomic status. They described hometown neighborhoods as homogenous settings, devoid of cultural diversity. However, in the same post-program questions, a majority wrote about increased awareness about fa-

milial customs, heritage, and diverse belief systems. In post-reflections, students described culture subjectively, more attuned to interpersonal variations within cultural groups, indicating enhanced awareness of cultural diversity. Therefore, high-impact experiences strengthened students' understanding of cultural diversity through reflection and recognition of their cultural heritage in concert with exposure to new cultures. Practitioners of international agricultural and/or high-impact experiences should engage learners in purposeful reflection exercises and immersive activities to enhance awareness of cultural diversity. Future research should seek causal connections between cultural identity and soft-skill development.

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The Use of a Therapy Dog to Relieve Test-Taking Anxiety

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Therapy dogs have commonly been used to relieve a number of different types of stress in people ranging from PTSD to the simpler stresses of daily life. Oftentimes, even the presence of an animal, regardless of interaction, can be calming to people. The objective of this study was to determine the effectiveness of a therapy dog to relieve test-taking anxiety to improve students' exam grades. To do this, we utilized four sections (n=25 students per section) of a single course. Prior to and during exams, a therapy dog was either allowed to roam around the room, or not present in the room. For each exam, two of the four sections were randomly selected to have the dog present during the exam. The dog was not present for more than two of the four exams in any one section. Grades were individually recorded for each exam and analyzed for the main effect of the dog's presence while taking into account differences among the four exams and course sections. While a difference did exist in mean grade among the four exams ($P<0.01$), no difference was detected due to the presence of the therapy

dog. This suggests that the simple presence of the therapy dog alone is not enough to relieve test-taking anxiety, or that the given exams were not enough of a stressor to generate test-taking anxiety in the students. In either case, the effect of the dog did not translate into grade differences in the course.

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Using the MUSIC Model of Motivation to Evaluate Course Pedagogy

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Educators in higher education aspire to integrate various pedagogical strategies that motivate student learning. The tone of the class-learning environment emanates from everything the instructor does, which ultimately affects student motivation, engagement, and learning. The MUSIC® Model of Motivation is a research-based model with an accompanying instrument designed to aid instructors to motivate learners, diagnose barriers to student learning, and develop effective instruction that facilitates learning through motivation. The MUSIC® acronym represents the five key principles of motivation that faculty should consider when designing pedagogy: 1) Empowerment, 2) Usefulness, 3) Success, 4) Interest, and 5) Caring. Throughout the Civic Agriculture and Food Systems (CAFS) curriculum, intentionality is given to use innovative and inclusive pedagogies that maximize student autonomy and agency over their learning. One required CAFS course, Concepts in Community Food Systems piloted the MUSIC® Model of Academic Motivation Inventory during Spring semester 2017. Instructors and students independently completed the MUSIC® Inventory that included two types of assessment, qualitative (open-ended items) and quantitative (Likert items). We will discuss the MUSIC® Inventory results in tandem with current pedagogical strategies used, and explore areas

for improvement in pedagogical course design. The MUSIC® Model of Motivation provides a framework for any instructor to evaluate, and subsequently, improve their course pedagogical strategies for increasing student motivation, engagement, and learning.

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Combining Reflection and Peer Review to Enhance Soft-Skills

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Written reflection and peer review are staples of soft-skill development. Reflection is a well-documented approach to high-impact learning. Peer review and critique are similarly vetted and established practices to improve communication skills. What happens when reflection and peer critique collide? This innovative teaching strategy combined reflection and peer review of visual images to enhance self-efficacy, critical thinking, communication, and metacognitive awareness in agricultural students. Prior to a study abroad experience, students captured digital photos symbolizing each one's personal cultural heritage. They also wrote reflections to articulate the metaphorical meanings of their photos. Each photo was critiqued through a double-blind peer review process. Peer reviewers examined unidentified photos (without author's reflections), and then wrote separate reflections to interpret the cultural symbolism of each photo. Students compared their original reflections with peers' interpretations. Participants had tangible evidence showing the same image could elicit similar/dissimilar reflections. Through the peer review process, students shared aspects of cultural heritage, gained mutual respect and appreciation for others' photos/reflections, and enhanced their communication skills. Students' mutual respect manifested itself through shared vision and interpretation, contributing to building community and understanding about cultural heritage. By comparing their reflections with peers' reviews/interpretations, students enhanced their communication effectiveness and message clarity when using photography to symbolize one's cultural heritage. Future research should combine peer review (visual, textual, and other forms) and reflective writing in other settings and disciplines. Instructors should seek further innovation to maximize personal identity and communication in learning environments.

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Success in a Big Place: Enrolling and Retaining Our Rural Students

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Research studies show rural students face unique challenges enrolling in college and being successful once enrolled. The purpose of this qualitative study was to determine factors associated with enrollment and retention of rural students at a land-grant university in an urban setting. After a literature review, interview questions were designed by the researchers and focused on factors impacting enrollment and retention. A semi-structured individual interview was conducted with fifty-six participants. Following each interview, responses were transcribed and returned to the participant to serve as a reliability check. Horizontalization was completed and three themes emerged: support, sense of belonging, and the want to succeed. "Samantha" stated *"I graduated at the top of my class... I thought I was smart and then struggled here at North Carolina State University. My advisor helped me find tutoring, but if it had not been for him, I would have left during freshman year"*. "Ben" found his home with a student organization that was made up of individuals like him and credited his success to finding a family within a big place. "Julie" chose a major that would not allow her to return home, wanting a life that would provide for her family. Her dream career is found in urban areas that are

unlike her hometown. These rural undergraduates had many similarities and quite a few differences; however, all stressed the importance of a support system and a sense of belonging as key to their success.

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If at First You Don't Succeed: A Reflection and Re-teaching Model

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How do teachers learn to teach? The idea of constructing a quality lesson is a daunting task. Yet we, perhaps naively, expect novice teachers to demonstrate a dynamic lesson to students whom they probably have never met, hoping they grow from the teaching experience before the next lesson, which is likely centered on a potentially related, but often dissimilar topic. Thinking about teaching has been defined as a "disciplined, systematic approach to professional development". One might argue the difference between expert and novice teachers is experience. While time and experience may play a factor in separating the novice from the expert, the real difference is how those who have developed expertise are able to think more effectively about problems in specific content areas. An important aspect of improving instruction is the ability to recognize patterns and features, and understand and conceptualize events, tasks with which novice teachers often struggle. Prior research helps us understand that reflection should be a thoughtful, deliberate and systematic process. Additionally, it is critical to be able to frame and re-frame problems, in order to modify and implement actions as a result of tested interpretations. The proposed model, used with preservice teachers, offers the opportunity to reflect on a micro-teaching experience, make adaptations, then re-teach the same material. Preservice teachers expressed satisfaction from the growth in teaching ability they experienced utilizing this model for micro-teaching.

Beyond teacher education, connections are also made for the application of this process to collegiate faculty.

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Recruiting Techniques and Influences on College Choice

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Although 60,000 agricultural employment opportunities open annually, only 35,400 students earn a bachelor's degree or higher in agricultural fields each year. Thus, the recruitment and retention of agricultural students by colleges and universities is crucial. Information, therefore, is needed to identify ways to increase the number of graduates in agricultural fields. The objective of this study was to determine the effectiveness of recruiting techniques and other influences on college choice. Researchers analyzed the data from 108 College of Agricultural Sciences and Natural Resources (CASNR) freshmen at Oklahoma State University (OSU). Respondents indicated mail (53.70%), electronic media/Internet (50.93%), and campus visits (46.30%) were the most effective recruitment techniques. The least effective techniques were phone calls (18.52%) and local group events (22.22%). Respondents indicated campus environment (89.81%), career opportunities after graduation (89.72%), and academic reputation (88.89%) were the top three influences on university choice. Least important factors for university choice were prominence of university athletic teams (42.06%) and availability of financial aid other than scholarships (47.22%). Future research should include determining what makes a recruitment technique effective. Additionally, universities should examine social media content to see if a specific post is more effective at directing prospective students to college and university information. Finally, universities should determine when prospective students make their college and major choice to improve their recruitment efforts.

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Asynchronous Platforms as Innovation for Global Learning in Agriculture (#GLAG17)

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Specialized professional development across multiple disciplines, organizations and professions that is topic specific can be valuable as it is targeted, but can be challenging to achieve in times of resource constraints. Online technology provides opportunity for collaboration, yet as expertise exists world-wide, challenges develop for synchronous engagement. To bring to together secondary agricultural teachers, extension educators and post-secondary faculty for a dialogue around global learning in agriculture, VoiceThread as a technology platform was used for delivery of asynchronous presentations by presenters in 5 U.S. states and 3 nations as part of a week-long build up to a Global Learning in Agriculture Conference. A total of 116 minutes of presentation was recorded and viewed over 102 times with 191 comments left in the video. Total registration for the event was 112 with many individuals hosting watch parties at their location. Representation was from 79 institutions in 31 states and 5 nations. Program evaluation collected online (response rate at 60%) indicated that 50% of those who completed the evaluation created a Voicethread account with 60% of those who created account leaving a comment. Written text was the most common form of engagement with voice recording being the second most common. Of the evaluation respondents, 64% strongly agreed that *"The event technology met the needs of the conference."* and 100% of respondents agreed. Pragmatic practice for implementation of this technology platform for wide-ranging asynchronous professional development will be shared with conversation around translation to other contexts and content.

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Exploring Immersive Video in Advancing Inquiry-Based Learning in Domestic and Global Settings

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To meet the ever-growing demands of a cultural, globally competent workforce, innovation leveraging all available technology is imperative. Innovation includes the re-imagination and reinvention of the application of existing technology to meet 21st century needs and pedagogical demands. The use of immersive video (also known as "360" video) for utilization in formal and non-formal curricular and co-curricular efforts was investigated with an interdisciplinary collaboration between multiple units in the college of agricultural sciences and extensive support from a university level teaching with technology innovation team. The project focused on promoting the development of student-created reusable learning objects advancing inquiry-based thinking in multiple educational contexts. The project pilot program was focused on developing protocol for integration of immersive video in class setting including, but not limited to: learner video planning, filming, course integration, and learner product evaluation/assessment. Faculty involved initially explored the program's use in non-formal learning spaces and expanded to individual students preparing for transformative learning experiences, student developing of video in global settings, as well as student project integration in a traditional agricultural mechanics course on campus. Results included the development of rubrics, the development of shared educator instructional language around immersive video and identification of opportunities for utilization in future engaged scholarship efforts. Agriculture education efforts were found to be uniquely suited to benefit

from immersive video by addressing seasonality, geographic, and learning laboratory challenges. Best practices for application to multiple contexts and content will be discussed.

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Concept Maps to Address Misconceptions in Introductory Science Courses

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Addressing complex and abstract topics in large, introductory science courses can present pedagogical challenges. Such courses are often populated with non-science majors taking those courses to fulfill graduation requirements. Undergraduate students can struggle with difficult, complex science concepts; often carrying with them misconceptions from prior learning settings. Previous research demonstrates that one of the issues with embedded misconceptions is that students struggle with comprehension of the relationship between abstract topics, such as photosynthesis and respiration or pollination and double fertilization in plants. Concept maps as teaching tools illustrate the relationship between concepts and between concepts and vocabulary. Therefore, concept maps have the potential to provide scaffolding that can address and remediate mistaken understandings. Semi-structured conceptual maps were developed to support student learning of identified topics within the large lecture format, both in person and online. Concept map development was grounded in constructivist theory, based on common misconceptions demonstrated in the literature, as well as the course. Utilization of concept maps in the course over several semesters assisted student learning of the identified topics as demonstrated by student feedback and quiz scores. Students indicated that the inclusion of the concept maps (as diagrams) in the course helped them conceptualize the terms they learn in lecture, and they appreciated being able to organize concepts and

vocabulary visually. Overall inclusion of concept maps as learning tools in a large science course has proven to be an effective manner in which to improve student learning of complex topics.

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Hispanics' Knowledge of the Land Grant Mission in the Mid-Atlantic

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Land-grant institutions are a major component of the United States education, research, and extension, providing an important service to the community in their states. However, this educational system is unique to the U.S. and most of the growing diverse population in agriculture is not familiar with its structure, mission, and services. According to the 2012 Census of Agriculture, the number of Hispanic operated farms has increased 21% between 2007 and 2012. Pennsylvania reported 652 Hispanic farmers, representing a 24% increase. What challenges are land-grant institutions facing when transmitting the land-grant mission and services to these new populations? A pilot study was conducted at the 2017 Mid-Atlantic Fruit and Vegetable Convention in Hershey, PA. Individuals in the Spanish-speaking convention tract were surveyed on their knowledge and perceptions of land-grant universities. Preliminary results indicate that the population is not familiar with the land-grant concept and mission. These findings indicate that land-grant universities are facing challenges communicating their mission to Hispanic populations. The Census Bureau projects that by the year 2050 nearly one in three U.S. residents will be Hispanic, meaning that Hispanics will have a significant impact on the demographics of the next generation of workers in the U.S. Hispanic workers' training is vital for compliance of agricultural regulations, food security, and safety procedures in agricultural production. Land grant universities

programming has been very successful in reaching traditional farmers. However, to successfully engage Hispanic audiences, Extension programs must be culturally responsive and new models for systemic change should be explored.

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An Approach to Addressing Educational Differences through a Participatory Study Abroad Program

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Study abroad programs have gained popularity and recognition over the past 10 years, due to an increased emphasis on providing students with meaningful experiential learning opportunities. Short-term study abroad programs (one to four weeks in length) have risen in popularity. One land-grant institution has even implemented a graduation requirement for all students to engage in an experiential learning opportunity. There, faculty developed a study abroad program to engage students in environmental education and cultural competency. During a week-long trip, students were engaged in a service-learning program with a local primary school to incorporate agricultural and environmental education concepts into the school curriculum. Students were asked to complete a reflective journal about their thoughts and learning. These journals were analyzed to evaluate the students' learning and engagement. While abroad, students were partnered with university students majoring in early childhood education to develop and implement lessons utilizing the newly constructed facilities at the primary school. The topics and projects completed by the college students were proposed and developed by the primary students. Each primary class submitted a proposal related to the curriculum being taught. This experience has led to students' increased appreciation for embracing others' strengths and weaknesses, commitment to success, their ability to reflect on their own thinking and actions, as well as their confidence to present information to others. Based on the findings from this program,

the researchers recommend other faculty develop specific study aboard programs that meet the needs of their students while employing reflective practices throughout the program.

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Livestock Evaluation Confidence and Training Interests of Youth Contestants

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Maximizing the effectiveness of future livestock judging education, such as livestock judging camps, would benefit youth as well as university animal science departments. The objective of this study was to explore the self-perceived confidence youth livestock judging contestants have for each aspect of livestock evaluation and to determine contestants' preferred training methods. Data were collected at the 2016 Oklahoma State University Big 3 Field Days from 430 4-H and FFA livestock judging contestants. The typical respondent was a 17-year-old male from rural Oklahoma. Regarding confidence in evaluating structural correctness, balance, muscle definition, fat thickness, volume, and growth in each of four species (cattle, hogs, sheep, and goats), participants indicated they were least confident in evaluating goats, moderately confident in evaluating sheep, and moderately to extremely confident in evaluating swine and cattle. Respondents indicated their most frequently used training method was their coach's personal knowledge (74.4%), live animal evaluation (55.6%), and online videos (46.7%). For additional training, respondents were very or extremely interested in attending livestock evaluation camps (69.3%), comprehensive judging seminar/clinic (57.0%), reason-specific judging seminar/clinic (54.2%), and specie-specific judging clinics (53.7%). Most participants (74.3%) indicated they were interested in judging at the collegiate level. In summary, contestants are at least moderately confident in evaluating all species; however, these youths have an interest in additional training and

judging at the next level. Therefore, animal science departments should provide training opportunities to improve contestants' livestock evaluation abilities and recruit future collegiate competitors.

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Why Students are Choosing (or Not) Careers in Food and Agriculture

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Recruiting future leaders into majors and careers in food and agriculture has been, and continues to be a challenging task. Currently, in the career fields of food, agriculture and natural resources, the USDA reports more jobs than graduates (57,900 jobs available each year for the roughly 35,000 annual graduates) necessitating recruiting students from fields not traditionally associated with food and agriculture. To understand students' decision-making processes regarding their choices related to entering disciplines or careers related to food and agriculture, four focus groups were conducted in partnership with the STEM Connector Food and Ag Council in three regions of the United States, representing students currently in food and agriculture disciplines and those studying in other fields. Each group was asked questions related to their perceptions of food and agriculture and their information sources related to major and career choices. Focus group transcripts were coded by question and each question code was open coded for emergent themes. The key findings are: 1) many respondents associated food and agriculture with "hard, dirty work" and had not considered many food

and agriculture supporting and intermediary industries; 2) respondents wished that they had learned sooner about the opportunities in food and agriculture and how their current major and interests could be applied to it; 3) family was identified as a major source of influence for respondents in choosing a major and career; and 4) a farming background did not necessarily increase interest in food and agriculture.

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Cooperative Team Learning to Motivate AET Instructor Professional Development

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Strong Agricultural Education and Training (AET) systems in developing nations are critical to improving food security, resilience to natural disasters, and sustainable economic development. The instructors working within AET systems must be able to facilitate student learning and work with a range of colleagues to create positive learning contexts. However, many programs that train AET instructors don't include training in instructional methods, creating lesson plans, or constructing assessment and lecturers are frequently forced to learning the craft of teaching on their own. It is likely that improvements in AET systems and the agricultural sector in developing nations will continue to be stifled if effective instructor training process are not constructed and actuated. 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 training in Nigeria. The findings illustrate that the AET instructor participants perceived that the Cooperative Learning Team (CLT) process helped them improve their pedagogical skills, increase their motivation to improve their teaching, and develop their ability to work effectively with their colleagues. Further, the AET instructor participants perceived that the social connections and accountability created through the CLT process were important in driving their motivations.

Future research should consider the use of an established instrument for measuring motivation so that levels of participant motivations may be assessed before and after the intervention.

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Experiential Learning Effectiveness in the NACTA Soils Contest

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The NACTA Soils Contest is one of the largest events in the annual NACTA Judging Conference. It offers the best opportunity for two-year schools to compete in collegiate soil judging and supports the goal of increased involvement of two-year institutions in NACTA. In 2016, the NACTA contest included 15 four-year schools and eight two-year schools, while the National Collegiate Soils Contest (NCSC) competition, sponsored by the Soil Science Society of America, included 23 four-year schools. In this presentation, we compare the NCSC and NACTA competitions and explain the valuable avenue soil judging provides for experiential learning in a field setting about the importance of soil, while also preparing students for potential careers in soil science. Students can apply information from the classroom as they observe soil properties to determine soil classification and suitability ratings. In the past, guidelines have differed between the NCSC and NACTA Soil Contest, especially for two-year schools. Comparisons between the NCSC and the two divisions of NACTA soil judging will be used to analyze learning objectives and effectiveness, particularly the benefits of group judging at the NCSC contests, which is not included at the NACTA competition. For 2017, some changes were made to the NACTA Soils Contest two-year rules to enhance the information that participants learn from the contests and better align the two divisions. With the correct procedures and requirements, soil judging prepares participants for real-world situations and careers and is a critical platform to develop students' understanding of the soil science discipline.

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Wait…I Can Use My Cell Phone in Class? Use of Innovative Technology to Engage Students

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The average American spends approximately 10 hours and 39 minutes in front of a screen during the day, according to a recent 2016 Neilsen Company report. Over 90 percent of students own some sort of handheld technological device such as a tablet or smart phone. Additionally, many students bring a laptop to class. Educators face the problem of these technological devices getting in the way or distracting students from learning. Students report fighting the temptation to peruse social medial such as Facebook, Twitter, SnapChat, and Instagram during class. Other distractions include text messaging, game apps, news apps, surfing the internet, shopping online, and watching videos discretely. Therefore, it is no surprise instructors are searching for ways to engage students in the learning process. Instructors in agricultural leadership classes at the [University] collaborated to build activities to allow students to use technology to promote student engagement, reinforce course materials, and complete assignments. Programs such as Kahoot!, Quizlet, Socrative, Remind.com, and Zaptopia provide platforms for students and instructors to use handheld devices and laptops to generate a culture of positive technology interaction. Additionally, the technology platforms provide formative assessment to allow instructors to gauge students' preparation and knowledge gain. Moreover, many of the programs provide immediate feedback to students. Better class preparation, heightened involvement, and healthy competition are factors students have positively identified with the inclusion of the technology programs.

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Examining Faculty Background and Self-Efficacy as Factors in Teaching

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Understanding faculty characteristics and educational background is essential to inform professional development for post-secondary educators. One important faculty characteristic to consider is self-efficacy related to teaching tasks. Self-efficacy has been previously cited as a component directly related to teacher performance. This descriptive study was conducted as a census of faculty members and teaching staff who taught at least one course in the College of Agriculture and Life Sciences during the 2016-17 academic year (N=53). The purpose of this study was to describe the teaching background and self-efficacy of faculty members, and examine differences in self-efficacy based on demographic factors. The survey instrument collected teaching background information, demographic characteristics, and included the short form of the Teacher Sense of Efficacy Scale to measure self-efficacy in the constructs of instructional strategies, classroom management, and student engagement. Results indicated more than half of respondents were not provided formal teaching training prior to instructing a class on the post-secondary level, and did not serve as teaching assistants prior to teaching a course as instructor of record. Overall, faculty members had moderate levels of self-efficacy. An analysis of variance revealed differences between self-efficacy constructs based on demographic characteristics. Faculty members who had taught longer reported lower levels of self-efficacy related to student engagement and higher classroom management self-efficacy. These results highlight the importance of faculty development for teaching, and can help frame discussions related to improving teaching performance and teaching confidence in faculty members within Colleges of Agriculture across the nation.

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Innovation - An Experiential Capstone Precision Crop Management Course

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Recent years have seen dynamic changes in field crop management strategies and capabilities as new and innovative "precision agriculture" tools are now relied upon by top crop managers around the world as essential. Undergraduate students in colleges of agriculture are often given opportunities to learn in general about precision tools and technologies but seldom can gain experience with their use with actual farm data to make and implement sound agronomic decisions. The objective of this presentation is to share the development and implementation of an experiential capstone course in Precision Crop Management for Senior students in Agronomy at Purdue University. In addition to gaining experience using a wide range of precision crop management software tools, students also gain professional presentation skills and experience as they prepare and deliver technical summaries of key precision crop management topics to industry representatives, faculty members and their peers at the end of the semester. This course has been taught using classroom presentations, precision mapping and farm data management software workshops and field trips to farms in each of the past three fall semesters. A total of 69 students have completed the course and student and industry feedback have been positive and have been used to make refinements each year.

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Flipping Together: A Collaborative Approach to a Flipped Course

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The flipped classroom approach has often been cited as a method for increasing student engagement, enhancing content comprehension, and integrating practical application of concepts. The purpose of this study was to compare changes in knowledge and confidence between concepts presented through traditional direct instruction and a flipped content approach. A faculty member in Agricultural Economics collaborated with an Agricultural and Extension Education faculty member to utilize best practices in creating and presenting active learning strategies for the flipped components of an upper-level agricultural sales course. The course was carefully designed to integrate both traditional and flipped components within the same course section, allowing the flipped components to integrate seamlessly into course instruction. Impacts of the two approaches were assessed through a pre/post course survey of student perceptions of agricultural sales, and confidence in knowledge of individual course topics, along with scores on the final examination for the course. Data were analyzed by describing student performance on each topic, and examining correlations between the changes in student confidence and resulting knowledge for topics taught in a flipped method and those taught traditionally. Although students performed well in class overall, they had varying degrees of change in confidence and knowledge for information presented in both types of instruction. Results highlight the importance of integrating active learning strategies and flipped content to help students gain both confidence and knowledge. The results of this study can be used to help frame the conversation regarding flipping courses in colleges of agriculture in the future.

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Developing the Annual Judging Conference and Experiential Learning as Priorities for NACTA

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As NACTA President in 2008, the author challenged NACTA to focus on greater recognition of the importance of student activities and experiential learning. This presentation analyzes the extensive progress that has been made in addressing the goals set forth with this challenge. A first objective was making the annual NACTA Judging Conference a more integral part of NACTA. The judging conference was already established as an excellent experiential learning experience for students, but previously operated almost independently of the parent organization, only using the NACTA name and receiving a small donation for the sweepstakes award. As a result of efforts by the NACTA Executive Committee and the Judging Conference Coaches Committee, major progress has been made. Outcomes have included raising funds and creating the NACTA Judging and Student Service Award, promotion and presentations about the judging conference at the NACTA summer conference, a NACTA officer attending and speaking at the judging conference, insuring that competing schools are NACTA members, increased financial support through the NACTA CHS grant, and the proposed constitutional change elevating the appointed NACTA Judging Conference Liaison to an elected Director with full voting privileges on the NACTA Executive Committee. Related outcomes have included creation of the new Experiential Learning standing committee of NACTA and support for NACTA's goal of increased involvement by two-year colleges, since over half of judging contest participants are from two-year colleges. Impacts of these initiatives will be presented along with future challenges for continued development of the experiential learning focus for NACTA.

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Evaluating Confidence and Concern in an Introductory Level EAAT Course

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Students enrolled in an Equine Activities and Therapies (EAAT) course at the University of Arkansas are not only concerned about working with people with disabilities, but are also concerned with their horse handling skills. Course objectives include increasing confidence in horse-handling skills and comfort level working with EAAT clients. Confidence and concern were assessed as a pre-test post-test using self-reported perception and concern markers with a survey instrument. Data was collected from 30 students enrolled in an EAAT course. Students rated themselves on 14 statements designed to measure confidence and concern utilizing a 4 point Likert scale (1 = strongly disagree to 4 = strongly agree). After the pre-test was administered students practiced skills and utilized concepts introduced in class. Data were analyzed using mixed models procedures of SAS. For 4 of the 6 confidence statements an increase ($P<0.001$) in confidence level was revealed after participating in the course. These statements pertained to assessing the type of EAAT that would be most beneficial for a client, determining the type of horse that would be most beneficial for a client, ability to assist in an EAAT setting and ability to help children participating in EAAT. For 4 of the 8 statements relating to concern, a decrease ($P<0.045$) was revealed. Students were less concerned after participating in the EAAT course with working with horses in a therapeutic setting, knowing how to communicate with a person with a disability, and causing harm to a child in an EAAT setting.

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Agricultural Statistics and its Role in Next-Generation Research

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Research in agriculture is evolving. To respond to the challenges of the modern day, agricultural research requires both knowledge of the hard sciences as well as a strong background in data analysis. The concentration in Agricultural Statistics developed at the University of the Incarnate Word answers this call. The program consists of courses whose content is driven by priority needs identified by the U.S. Department of Agriculture and the National Institute of Food and Agriculture, and is funded by a USDA/NIFA grant. These interdisciplinary courses are team-taught by members of the Statistics department along with members from Biology, Chemistry, Meteorology, and/or Nutrition. The unique design of these courses give students in-depth training in data analysis, but tailors it to these specialized areas, thus creating well-rounded researchers who can understand the statistics as well as the science behind the experiments. Examples of courses include Community Ecology, creating statistical models related to species abundance and biodiversity; Hurricane Climatology, constructing mathematical models of weather data; and Sampling Techniques in Forestry, using mathematical model-based geostatistics. As part of the courses, students participate in experiential field trips and on-site lectures to see the science in action. The program also sponsors a Speakers Series where researchers present conference-level talks on campus, exposing students to current work in the field. By combining statistics and agricultural science, we have given students unique job-ready skills and exposed students from other disciplines to real-world research in the agricultural sciences.

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Plant Madness in Plant Identification

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Plant identification courses in horticulture curricula expose students to numerous plant species. In the Landscape Plants II course at Kansas State University, focuses primarily on learning common landscape plant genera and species within, with less emphasis on specific cultivars or selections. To expose and provide opportunities for students to recognize and be aware of important and 'new' plant selections in the industry, an activity based on the college basketball March Madness, was integrated into the course. In Plant Madness, each student randomly drew a plant (team) from a hat that was not covered in the regular course content. On 'game days', students 'played' their plants against the other team for two minutes. Play consisted of highlighting plant attributes, faults, advantages, etc. Guest judges scored and the plant team with the highest score advance to the next round. In addition to providing an opportunity to learn more recent, cultivar specific plants, a goal was to provide students an opportunity to be creative and further develop their public speaking skills. A post-activity survey was administered to obtain student feedback (n=22). When asked if the students liked the activity, it was unanimous, 100% liked Plant Madness, with 90% indicating that they believed the activity increased their awareness of 'new' or recent plant cultivars. When asked to rate the activity compared to other class approaches for learning different plants, 77% indicated it was above average to excellent. Fifty percent of the students agreed that their presentation skills were enhanced.

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Understanding Cultural Heritage Prior to High-Impact Educational Experiences

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Culture is an integrated pattern of knowledge, beliefs, and social norms. It is a set of shared values, goals, and practices that define individuals' characteristics. Awareness of one's own cultural heritage has been shown to increase efficacy and academic achievement. Paramount to increased understanding of others' cultures is foundational comprehension of one's own cultural heritage. "My Cultural Heritage" is an instructional method designed to deepen learners' understanding of their cultural heritage prior to an international educational experience. In this study, 34 participants' essays were analyzed from two agricultural study abroad programs. Participants investigated their cultural heritage (i.e., family origin, history, traditions, and norms) to identify and validate self-identity. Qualitative analyses of participants' essays revealed increased recognition of familial customs and norms. After in-depth research of their family's background, many students reported "a stronger sense of who [they] were and where [they] came from." Some students were surprised to discover family relatives and ancestral customs contradicting current beliefs about their family's cultural heritage. These data indicated that understanding your family's cultural heritage leads to greater recognition and acceptance of others, a powerful tool in inclusive education. Gaining a sense of culture, divulges a common aspect of interconnection. Participants learned that different cultures enhance our agricultural systems through their unique cultural heritage. Instructors can use cultural heritage investigations to deepen learners' ownership of self

and create an educational environment conducive to tolerance, teamwork, and achievement. Future research should investigate potential connections between cultural understanding and cognitive processes when experiencing intercultural communications.

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Is Classroom Polling an Effective Method for Facilitating Student Interaction?

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With the advancement of technology, teachers have a vast number of ways to integrate new tools into their teaching strategy. Students have access to unlimited information with electronic devices that can be utilized in the classroom to facilitate learning. One popular approach is the use of polling applications to allow students to interact in class while providing quick assessment for the educator. Within the Department of Agronomy at Kansas State University, six classes and five laboratory sections are applying different polling applications. Kahoot!, Top Hat, and Poll Everywhere are three systems being used in today's classrooms. The objective of this study was to evaluate polling as a method of increasing student involvement in the classroom. Results demonstrate that this teaching method creates a more inclusive classroom involvement opportunity compared to verbal discussion, especially in large classes. It allows, and in fact requires, that all students participate when they might not otherwise. Systems differ in functionality and cost, and each polling application is unique in the user interface. However, all facilitate a common goal of stimulating critical thinking and increasing student involvement. A better understanding of multiple polling applications will help educators determine the situational advantages and disadvantages of deploying new interactive technology. Polling provides the potential to create more classroom involvement, but the instructor must

develop effective questions to meet learning objectives. The use of polling software is not a stand-alone technique, but is an innovative technique providing another form of student interaction if implemented properly.

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Knowledge Generation Builds Confidence in an Advanced Production Class

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Undergraduate students are accustomed to learning from past discoveries, but seldom have the chance to advance scientific knowledge. Providing an experiential knowledge creation opportunity can foster student engagement, enthusiasm, and confidence to share their discoveries. In the laboratory component of a senior level poultry production class, three cohorts of students were provided opportunities to conduct simple but rigorous scientific broiler chicken production studies of publishable quality. Class size ranged from 13 to 27. The course objectives included: 1) to achieve fluency in industry issues; 2) to understand the science behind factors contributing to production efficiency; 3) to gain inquiry-based learning skills; and 4) to master communication skills. Volunteer learning coaches, students who had previously taken the class, were recruited for data acquisition quality control, and to support, engage, coach, and in-spire students. Sharing responsibility for the final presentation helped students build confidence in their oral communication skills. Students worked together to create a single class presentation in which each student was responsible to weave their narrative seamlessly into one complete high impact story. In course evaluations, students reported high levels of engagement and appreciation for the hands-on learning experiences. An industry participant commented on the level of engagement of students during the question period.

after their final class presentation, *"…during the question period, not one of them was distracted"*. All were focused, engaged, and confident to discuss a project for which they felt genuine ownership.

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Exploring Educational Technology: Students Helping Faculty

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A plethora of useful educational technologies exist to boost student engagement and increase efficiency within the learning environment. However, instructors may not utilize these useful tools because they are not aware of them, or they do not know how to use them. In an effort to improve instructors' self-efficacy in incorporating educational technology into the learning environment, Ed Tech Info Request was developed. The Ed Tech Info Request allows instructors in the College of Agriculture and Human Ecology to request information on specific educational technologies. In the instance that instructors have a desired outcome from utilizing technology, but no knowledge of appropriate tools, they can indicate that. Once requests are received, Agricultural Education preservice students explore the tool, and develop a one-page brief describing the tool, applications of the tool, and step-by-step instructions. The one page briefs are released each Tuesday to various social media platforms with the hashtag, TechTipTuesday. The one-page briefs are also housed on various unit and departmental websites across campus. The project has received positive feedback from the campus and has garnered national attention from the companies whose tools are highlighted (i.e., GradeCam and Plickers). Although the project was developed to assist instructors, preservice teachers also develop self-efficacy in incorporating the technologies into the learning environment, which will be helpful when they become teachers. We intend to develop an e-book from the compiled one-page briefs annually.

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What to Teach in Horse Behavior and Handling Courses

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The purpose of this nationwide study was to determine the technical horse behavior and handling skills that equine industry employers and collegiate equine instructors consider most important for equine oriented college students to possess. Panelists were asked a series of open ended questions about horse behavior and handling skills that most contributed to student employability, in the case of industry professionals, or were most important for students to know, in the case of educators. Skills were categorized into nine topic areas: behavior, handling, managerial, health, business/industry, science, riding, training, and transferable. Panelists (n=28) ranked each skill depending on importance using a Likert scale from one (strongly disagree) to seven (strongly agree). Panelists then reworded statements that failed to reach consensus to describe why those statements failed to reach consensus. Industry identified five transferable skills as top priorities (e.g. have a work ethic), while academia listed only two transferable skills in their top skills. Top skills/categories desired by academia were understanding horse behavior (6.6) while industry overall ranked transferrable skills (6.3) as their highest priority. The most important skills according to both groups included transferable skills and skills related to horse health, management and handling. Least important skills were related to training (5.3) and riding (5.4.) According to the panelists, student interest should dictate whether students become proficient in skills related to a specific industry sector, discipline, or type of horse. This information can be used to better shape instruction and experiences for equine focused college students.

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Maximizing Interactivity through Breakout Rooms Using Web Conferencing

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Even in courses delivered synchronously to on and off-campus students, challenges may exist with issues of transactional distance (TD). Renowned distance education researcher, Michael Moore, defined TD as the cognitive space between instructors and learners, in face-to-face as well as distance education settings. Findings from multiple studies on TD cite a lack of discourse between students and instructors as a major factor. To reduce TD in a graduate level mixed-delivery course between on-campus students/instructor and online students via a web conferencing platform, students were divided into teams and each team was assigned to a Breakout room. The teams were formed to represent agricultural disciplines, such as plant science, animal science, and precision agriculture. Based on weekly readings, a discussion question specific to each team's topic was provided to students in advance. In Breakout rooms, a different student served as the facilitator each week, alternating between on and off-campus students. Using Breakout rooms, students interacted through various media, including audio, video, text chat, and file-sharing. An on-campus student noted, *"We heard the opinions and feelings of people from different walks of life who are currently working fulltime. This also gave us the chance to interact with people who have similar interests other than with the entire class."* An off-campus student reflected *"Breaking into smaller groups assisted me to feel more like a 'classmate' instead of a county agent on another side of the state."* Presentation objectives include: 1) discuss student reflections of benefits/challenges of breakout groups, 2) identify factors for improvement.

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Transformative Learning: A US Internship and Service Abroad in Laos

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Colleges of agriculture strive to leverage institutional resources to provide educational environments that transform both students and communities. This study describes the experiences of six agriculture students' who participated in a new hybrid program that combined a domestic internship and an international service learning program in Laos during the summer of 2016. Transformative learning (TL) experiences catalyze changes in students' moral, political, intellectual, personal, cultural, and spiritual perspectives as well as perceptions of their own abilities. A "disorienting dilemma" is central to TL models, however the individual must engage in structured reflection to realize and experience transformation. Data sources included reflection assignments and course projects produced during the experience and interviews conducted six months after return. Several themes emerged: many of the participants' preconceptions and expectations were not confirmed; each was confronted with difficulties in Laos; they noted differences between US and Laotian agricultural systems; the "high context" Laotian social relations were a revelation and appeared to increase appreciation for the complexity of intercultural communication and collaboration; both the internships and foreign contexts exposed assumptions and deficits in knowledge, triggering evaluation of participants' own knowledge, attitudes, and skills. This examination provided validation, clarification, or reorientation of aspirations. Participants attributed new behaviors, motivations, and access to opportunities to the hybrid experience. These findings suggest that scaffolded experiential learning opportunities which span disparate contexts may support TL.

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Impacts of Teaching Garden Hands-On Activities on Student Learning

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The Vegetable Teaching Garden at the University of Florida plays an important role in providing hands-on learning opportunities to students attending courses in the Horticultural Sciences. Integration of well-designed hands-on activities can be an effective tool to engage students in the active learning process. In fall 2015, we conducted an online survey study to obtain an up-to-date comprehensive understanding of student perceptions of hands-on learning activities. A 1-5 rating scale (1 = highly negative, 2 = slightly negative, 3 = no influence, 4 = slightly positive, and 5 = highly positive) was used to assess the impacts of hands-on activities on different aspects of student learning in four of the vegetable crop production related courses. Out of the 126 complete responses received, over 75% of the respondents reported positive impacts of hands-on activities on acquisition of knowledge, gaining new technical skills in horticulture, devoting time to be outdoors connecting with nature, gaining physical exercise, interest in the discipline and guided-research, developing teamwork skills, interest in courses in future semesters with a focus on hands-on activities in the teaching garden, and overall motivation in horticulture. Interestingly, female students were more influenced than male students by hands-on activities about learning new skills in horticulture and interest in taking additional courses using a hands-on learning approach. The impact score associated with writing and presentation skills was significantly lower than that of other variables. This study offered insightful suggestions for employment of hands-on learning to enhance student recruitment and engagement.

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Innovative Teaching Strategies for the Undergraduate Introductory Course

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The first course taken by undergraduate students in their major is critical for continuation and completion of their degree. It is also when many students are unsure about their major and are sharing their interests and academic plans with classmates who ultimately may switch or keep their major. Majors such as Agricultural Science Education, Communication, and Leadership often offer their own introductory courses while being part of one department. It is rare today to find departments of Agricultural Education that solely focus on Agricultural Science Education. Rather many departments in our field include areas of Agricultural Communication, Education, Leadership, and Outreach/Extension Education. From the research literature and best practices the following key components were implemented for an innovative and comprehensive approach to an introductory course:

1) Offer one undergraduate course for all three majors
2) Team-teach with faculty leaders for each of the majors/specializations
3) Focus on common aspects of each major rather than differences
4) Equal faculty involvement
5) About one quarter of class meetings for each major were held separately
6) Promote benefits for students to have an understanding across majors
7) Encourage unity among students as part of one department
8) Involve students who are minoring in the department as equals with our student majors
9) Class viewed as a gateway course to the department

The team teaching approach by the four faculty have been successful based on evidence from student evaluation reports, recruitment of new students, and overall unity within the department by students and faculty.

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Planting the Seeds of a "Pedia" Project

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As an alternative means to assess students' mastery of course material while extending their knowledge beyond what could be presented in the classroom alone, "pedia" assignments were developed for two upper level plant science courses at Sam Houston State University in 2015. Following development of the "pedia" website and populating the format page with a general framework of information and illustrations required, students were required to search on-line information, properly format the information and illustrations required, and cite all references used to contribute to their respective "pedia" site. In the Forage Crops and Pasture Management course, students could select from a list of pasture weeds, brush, grass and legume species common to Southeast Texas, while in the Integrated Pest Management course, they selected from a list of plant diseases, insects, and nematodes for their assignment. Once notified by the instructor as to their assignment, they were allowed three weeks to gather and complete the body of knowledge required. The combined on-line student assignments will be made public soon in a format like the familiar Wikipedia. Student constructed web sites, "Common Pasture Plants of Southeast Texas" and "Farm and Garden Pests of Southeast Texas," are designed to serve as information sources for farmers, gardeners, and others interested in such topics. This project builds a sense of community and promotes the application of modern knowledge sharing.

288

Assessing Collections-Based Learning in Online Classes

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Assembling and curating a specimen collection is a valuable activity to integrate lessons on finding, preserving, identifying, organizing and interpreting an assemblage of objects - be they insects, plants or something else. Traditionally, collection projects are used in face-to-face classes, but they can also be successfully adapted for distance education. Challenges in doing this are similar to those in modifying lecture or laboratory classes. Primary concerns about using collection projects in distance education are 1) whether online students gain as much benefit as in-class students and 2) if academic dishonesty is a greater problem online than in-person. To address both concerns, this study assessed learning outcomes in pre- and post-course surveys in an advanced course and specimen-based plagiarism (students submitting specimens collected by someone else) in two entomology courses with in-person and online sections. A five-year 'mark-release-recapture' experiment involved marking thousands of specimens submitted in student collections, which were released back to students. In subsequent semesters collections were checked to detect recaptured specimens. Comparison of advanced entomology students' identification abilities revealed that online and in-class students entered the course with significant differences in knowledge (T test: t=4.557, p<0.0001), but end-of-course outcomes were equivalent (T test: t=1.028, p=0.153). In contrast, academic dishonesty was more prevalent in online than face-to-face sections of both classes (logistic regression: z=2.473, p=0.0134). These results highlight the fact that collections can be effective teaching tools in online education, but underscore the need for instructors to consider how to maintain academic integrity and deter cheating in online classes.

289

Teaching Personal Finance to Undergraduate Students

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In general, college students lack financial literacy. For example, the majority (89%) of first-year college students scored a "C" or below on a national survey of the five core financial literacy competencies identified by the U.S. Department of the Treasury Financial Literacy and Education Commission: Earning, Spending, Saving, Borrowing, and Protecting (Inceptia, 2013). Furthermore, evidence suggests that college students make financial decisions without adequate information, guidance, and support. The issue of financial literacy among college students is even more critical today, especially in an era of increasing student loan debt and in many cases student loan default. The introduction to personal and family financial planning course (FYC3005) seeks to fill this gap in financial literacy and financial capability among college students by providing financial education and life skills that are needed to make informed decisions in their everyday life and across their life cycle. Students complete a four-part financial project based on their own financial situations throughout the semester. Students complete a financial literacy pre-test the first week of class and a post-test the last week of class. The pre/post-test includes the "big three" financial literacy questions, created by Lusardi and Mitchell (2011). The pre/post-test also includes financial behavior questions such as tracking income and expenses, paying bills on time, having financial goals, checking their credit report, setting aside money for emergencies, and paying credit card balances in full each month. This interactive session will include a presentation of the study findings and a discussion of assignments and activities.

290

Peer Mentoring Majors: Elements of Effective Mentor Training

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Peer mentoring is not a new approach in higher education. To ensure the success and retention of students, multiple approaches to mentoring are employed depending on mentor availability, program resources, program structure and student needs. Improving the current peer mentoring approach for underrepresented students participating in MAPP (mentoring among peer's program) in the College of Agricultural and Environmental Sciences at the University of Georgia was the focus of this work. To explore solutions to the challenge of training students to help in retention initiatives for underrepresented students in the College, open ended questions were added to the year-end MAPP survey on mentor experience; and, mentors participated in year-end focus groups. When mentors were asked, *"Do you feel you are an adequate representative of the College?"*, multiple themes related to mentor training and preparedness emerged including a need for mentors to complete: College of Agricultural and Environmental Sciences Ambassador training (to include knowledge of all majors, transfer student information, advisor contacts and college focused resources), campus-wide resources training and cultural competence training. These and other emerging themes from the mentor focus group confirmed that beyond training on helping freshmen navigate common challenges in their first year, mentors needed to gain an in-depth knowledge of the College to serve as an effective mentor. Results confirmed that peer mentor training ensuring a strong connection to the College's people, professors, administrative leaders and resources is a critical component of mentee success and retention, especially among underrepresented students in colleges of agriculture.

291

Characterizing Instructor Priorities for Organic Ag Education

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Organic agriculture courses in higher education have become more common in recent decades, with the development of new programs and student organic farms. However, this subject is usually taught as an upper-level class and often reflects the local or regional experiences of the instructors. The goal of this project is to develop and test a multi-regional organic agriculture curriculum in a variety of undergraduate courses with diverse audiences. The first objective of this project was to characterize instructor's mental models for organic agriculture education, identifying critical concepts to be used for the development of the curriculum. To accomplish this, we interviewed and surveyed 19 instructors at universities and colleges across the United States. Interviews were transcribed and coded using an open coding structure. The critical concepts most frequently mentioned by instructors were soil fertility, ecological principles, and National Organic Program certification and standards. Instructors were also asked about challenges and successes in teaching organic agriculture. The most difficult concepts for students to learn that instructors identified were systems thinking, nutrient management, and making nutrient calculations. Factors that instructors attributed to their teaching success included having a guest lecturer, co-teaching or having a teaching assistant, and having connections with farmers and producers. The results of these interviews have given us a clear idea of the specific concepts that a variety of organic agriculture instructors find critical, as well as unique insights into challenges, successes and resources they have.

293

Students' Assessment of the Practicum Period Required for Graduation at National Agricultural University Peru

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Innovating education at national agricultural university La Molina Peru is the objective of a project with collaboration of the Flemish interuniversity council (VLIR) led by KU Leuven. To improve the practicum period (two months), which is a compulsory requirement for all degree programs, an on-line survey study was conducted among students of the animal science program that successfully completed the requirement in the last two years. Voluntary participation of 41 students to the survey was 60% of the total. The students considered that the work load during the practicum was appropriate and rated high the practical knowledge and new methodologies obtained and the contribution to improve self-confidence and to integrate theory and practice. Also indicated was the need to have better coordination between university, placement of the practicum and students as well as better scheduling of activities during the period. This gave them the opportunity to identify options for employment. A new project (EDULIVE) led by BOKU University, with funding from Erasmus Plus Program EU, is focusing now on developing strategies to promote stronger links with the industry to improve practicum periods at two animal science programs of Peru and two of Argentina.

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Capturing Experience: Using Experiential Learning to Teach Photography

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Photography is an important competency of agricultural communications graduates and is a core skill taught in the discipline's curriculum. The Department of Agricultural Education and Communications at Texas Tech University offers an undergraduate photography course twice yearly in two semester formats: a traditional, 17-week spring semester where photography principles are taught in the classroom and a 12-day experiential intercession course that allows for flexibility in how and where the course is taught. Both semesters utilize the same instructor, assignments, and grading rubric. While much agricultural communications research has focused on photography as a needed skill, few studies examine photography teaching methods. The purpose of this study was to compare student performance in an agricultural communications digital photography course taught with an experiential learning approach to a traditional classroom approach. Experiential learning theory was used as the theoretical framework for this study. Independent-samples t-tests were conducted to compare students' cumulative mean assignment scores, individual assignment mean scores, and rubric criteria mean scores within the two instruction formats. The results suggest instruction method influences student performance in agricultural communications digital photography courses. Students in the experiential intersession course had significantly higher mean cumulative assignment scores (M=183.00, SD=7.33) compared to students in the traditional course (M=170.70, SD=12.03), t(38)= -3.38, p<0.01. While individual assignment performance was less affected by instruction format, students' understanding of specific photography skills (rubric criteria) was higher when in the experiential intercession format.

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Internships or Study Abroad: Influences of Career Decision Making

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Increased emphasis is being placed on active learning approaches such as undergraduate research, service learning, study abroad, and internships. This study utilized the Taxonomy of Difficulties in Career Decision Making. This framework identified three broad focal categories that can result in a student making an undesirable career decision; lack of readiness, lack of information, and inconsistent information. Participants consisted of students at a southwest university's agricultural college. Fifty-five participants completed a duplication of the Career Decision Making Difficulties Questionnaire. Participants were placed into discrete groups by their involvement, or lack of involvement, in study abroad and internships. Students who participated in study abroad (p=0.03) and those students who participated in study abroad and an internship (p=0.03) reported experiencing a significantly less "lack of information" than those students who did neither an internship or study abroad. Additionally, students who have participated in an internship experienced less "lack of readiness" than those students who did not participate in an internship or study abroad (p=0.01). Faculty and staff should promote study abroad to students who score high within the lack of information category. Additionally, internship should be promoted to students who score high within the lack of readiness category.

300

Directed Readings Course: Student Engagement, Discussion and Mentoring

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At Purdue, AGR 29400/49400 *"Directed Readings in Agriculture, Environment and Society"* is a dual-level, 8-week, variable credit (0.5-3) course, Honors credit is available, and class sizes range from 6-12 students. This course is always co-taught, normally by instructors from Agriculture and University Libraries, modelling rational civic discourse and critical thinking skills to be engaged scientists and citizens. The readings revolve around popular contemporary books: *"Denialism: How Irrational Thinking Harms the Planet and Threatens Our Lives"* (2010; Michael Specter*); "Quiet: The Power of Introverts in a World that Can't Stop Talking"* (2012; Susan Cain); *and "The Omnivore's Dilemma"* (2006, Michael Pollan). Learning Objectives include: (1) Develop an appreciation and understanding of the importance for the practice of critical reading; (2) Develop the ability to come up with questions that address the bigger/broader picture as shared through the readings; (3) Clearly articulate position and/or justify and defend stand amongst one's peers; (4) Carefully review and consider the facts, consider and propose future directions that could be taken as a result of the readings; and (5) Develop initial strategies to discover pertinent and reliable information to improve one's understanding. Assessment of student performance involves: (a) weekly instructor and peer evaluation of discussion contribution; (b) presentation and explanation of supplemental material; and for Honors, (c) preparation and perceived effectiveness of leading the group's discussion that session. The course has proven to be an effective educational experience, in which evaluations and follow-up conversations show that students appreciate small group discussions following a critical reading.

POSTER PRESENTATIONS

002

Longitudinal Trends in Four- and Six-Year Graduation Rates

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Universities with higher graduation rates are deemed to be more efficient and have greater levels of alumni and public support. Likewise, individual academic colleges are deemed more efficient and receive greater support when entering freshmen are retained in that college until graduation. We compared the College of Agricultural, Food and Life Sciences (AFLS) and other academic colleges at the University of Arkansas on trends in their four- and six-year retained graduation rates for the freshmen classes of 1998–2010. For non-AFLS colleges, the retained four-year graduation rate increased from 17.9% to 27.3% over the period. Linear regression indicated the associated increase in graduation rate was 0.69% per year (P=0.04). The AFLS four-year graduation rate increased from 21.4% to 38.1% with an associated increase of 0.85% per year (P=0.02). There was no significant (P=0.82) difference in the slope of the regression lines for AFLS and non-AFLS colleges. For non-AFLS colleges, the retained six-year graduation rate increased from 37.3% to 43.6% over the period. Linear regression indicated the associated increase in graduation rate was 0.51% per year (P=0.003). For AFLS students, the six-year graduation rate increased from 32.1% to 50.5% with an associated increase of 1.06% per year (P=0.02). Again, there was no significant (P=0.18) difference in the slope of the regression lines for AFLS and non-AFLS colleges. Four- and six-year retained graduation rates were higher for AFLS; however, AFLS improved at the same rate as did non-AFLS colleges.

003

Agriculture and Non-Agriculture Transfer Students: A Longitudinal Comparison

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Transfer students comprise a significant percentage of undergraduates in institutions of higher education and in colleges of agriculture. We compared trends in transfer student enrollment, in first-year/same-college retention, and in four-year/same-college graduation rates for students entering Agricultural, Food and Life Sciences (AFLS) and other colleges (non-AFLS) between 1998 and 2014. Regression analyses indicated a significant (P=0.04) positive trend (0.27% per year) in enrollment of AFLS transfer students (26.0% vs. 28.1) and a significant (P=0.001) negative trend (-0.82% per year) in enrollment of non-AFLS transfer students over the 17-year period (28.7% vs. 18.5%). These regression coefficients were significantly (P=0.00) different, indicating diverging enrollment trends between AFLS and the university. The mean AFLS and non-AFLS student transferred 53.6 and 50.3 semester credit hours, respectively, with no significant (P>0.05) trend for either group. Overall, first-year/same-college retention was significantly (P<0.001) higher for AFLS (74.7%) than for non-AFLS (67.3%) transfers; however, regression indicated significantly (P<0.001) different retention trends for AFLS (-0.04% per year, P=0.88) and non-AFLS (0.39% per year, P=0.00) transfers. Overall four-year/same-college graduation rates were significantly (P<0.001) higher for AFLS (57.7%) than for non-AFLS (40.2%) transfer students. Regression indicated year was not a significant (P>0.05) predictor of graduation rates for either AFLS or non-AFLS transfer students. The percentage of transfers increased for AFLS; however, AFLS transfer retention and graduation rates, while higher than non-AFLS, were flat. Increased attention to AFLS transfers is warranted.

011

Sowing the Seeds for a Multicultural 21st Century Skills Workforce

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Students enter college with the expectation they will acquire the necessary skills to find gainful employment upon graduation. This is also the case with high school student expectations that they will possess the necessary skills to achieve admission to and succeed in college. The National Academies indicates that during an undergraduate education, students should master a variety of transferable skills and knowledge considered important in the workplace. The goal of this USDA funded project was to prepare high school students to be college ready and equipped with soft skills needed to succeed in college. The primary objective of the project was to provide soft skills training to 20 minority high school students blended in a class with undergraduate students in the Huntley College of Agriculture at Cal Poly Pomona. Successfully demonstrated curriculum (20% increase in soft skills) was utilized coupled with a flipped classroom approach. For the purposes of this project the curriculum emphasized non-violent communication, team building, and professionalism skills. Exit survey data indicate: 1) 43 high school students received the training, exceeding the project enrollment goal of 20 students; 2) all students reported they were more confident they will in succeed in college after taking the course with 23% reporting extremely confident; and 3) students reported their soft skills competency increased by 55%, exceeding the project goal of 20%. The project has demonstrated that innovative teaching strategies and soft skills training that complements technical training can improve college readiness.

013

INvigorating Career INterest: Group Reflection of Job Shadowing Experiences

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Job shadowing reflection days were implemented in the Introduction to Agricultural Information Science class at MSU (N=42) in Fall 2015. Students in this class are required to select and complete two job shadows during the semester. To capitalize on the learning process, reflection days were added to heighten the learning experience. Thirty-six students completed job shadow reflection #1 and 35 completed job shadow reflection #2. Groups for job shadow #1 consisted of those who shadowed agriculture teachers, sales representatives, managers, Extension agents, production agriculturalists, agricultural communications, and one group consisting of a variety of careers. Groups for job shadow #2 comprised of a variety of career fields to allow for more diverse discussion. Group discussions about their reflections allowed students to learn from each other while thinking about their experience at a deeper level. Overall students expressed their satisfaction with the reflection day activities. Students commented the reflection activity gave them *"… a different outlook on my experience that I might not have picked up on without the group"* and *"a chance to relate to other students who are pursuing the same career path as me."* Students should be encouraged to use more graphics/pictures to communicate their discussion to the entire class. This practice will be used for future job shadows/field experiences as a method to encourage students to reflect at a deeper level without creating more papers to grade. This activity can also help build professional networks and group cohesion in a class.

014

INvestigating Faculty Knowledge and Perception of SoTL Research

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The Scholarship of Teaching and Learning (SoTL) is needed to improve our education practices. A survey was emailed to MSU CALS faculty (N=225) in the 2016 spring semester to better understand the knowledge and perception of SoTL. There were 49 respondents (22% response rate); with 67% (n=32) males, 41% (n=20) assistant professors, and all nine departments in CALS represented. There was interest to learn more about Social, Behavioral, and Educational (SBE) research, but the low response rate could indicate a lack of interest by faculty in improving SBE research. Conclusions drawn from the SBE research section indicated 74% of the respondents would conduct SBE research if they were informed about the IRB approval process; however, 67% of the respondents were not interested in attending a workshop about the IRB approval process. A majority of the respondents (60%, n=25) had not conducted SoTL research previously, but the same number reported an interest in attending a workshop to learn more about methodologies used. Those who have conducted SoTL research shared qualitatively that it has allowed them to be more reflective about their teaching methods by having data or narrative to compare with learning objectives. It provides a basis for continual improvement and allows faculty to keep up to date on new advances in teaching methodologies. Recommendations include more clarification of the IRB approval process, host workshops to increase faculty confidence in conducting SoTL research and encourage faculty members to mentor each other.

016

Measuring Optimal Learning Experiences Using the EduFlow Scale

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This case study sought to descriptively explore students' optimal learning experiences or "flow" experiences utilizing the EduFlow Scale in a College of Agriculture and Natural Resources' Organizational Management for Community Sustainability course at Michigan State University. The purpose of this study was to determine if instructional and assessment experiences were related to dimensions of "flow" including: 1) Cognitive Absorption, 2) Time Transformation, 3) Loss of Consciousness, and Autotelic Experiences. Instructional and assessment approaches measured included: 1) Lecture/Discussion, 2) Guest Speakers, 3) Experiential Learning Activities, 4) Authentic Assessments, 5) Student Presentations, and 6) an Online Case Study Analysis. Sampling techniques involved a modified interval-contingent Experience Sampling Method approach after each class session. Data were analyzed at the individual interval level (n=282). Of the instructional and assessment approaches measured using a Likert Scale (1 - Not Agree to 5 - Very Much Agree). Cognitive Absorption dimension scores were highest during Authentic Assessments (M=4.35, SD=0.57), whereas Time Transformation (M=4.16, SD=0.70) and Loss of Consciousness (M=4.33, SD=0.64) dimension scores were highest during Experiential Learning Activities. These results suggest that authentic assessments may be most beneficial for cognitive learning, whereas experiential activities may result in a high degree of engagement by students and the potential for "flow" in learning. This study suggested that types of learning experiences are related to student "flow" dimensions and the EduFlow Scale may have merit in measuring student optimal learning experiences in an undergraduates' Land-Grant University experience.

017

Student Perceptions: How Effective is Team Work?

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Instructors often make use of group projects to promote student participation, inculcate team working skills, and to enhance students' soft skills for service related jobs in the agricultural industry. Student groups work on project milestones followed by instructor feedback for improvement, and project completion is marked by student teams' engagement in interactive group activities such as presentations, debates, and sales pitches. The overarching goal of this study is to evaluate the use of group or team projects for enhancing student learning in agribusiness courses using survey data. Specifically, this study examines the use of group projects such as policy debate, farm business plan, market simulation, market plan, and sales pitch in an array of lower and upper level agribusiness courses using an online five point Likert scale survey tool. Results indicate that students find value in these interactive projects, which facilitates a higher level of learning. Students also feel confident about their soft skills, and can better enunciate and express their viewpoints among an audience. In addition to the survey, peer evaluation results highlighted some issues with group work, such as the existence of the free-rider problem. Students suggested the need for a team leader to keep everyone on track through the different stages of the project. Instructor feedback at various stages of group work was perceived useful by the students, however class size can significantly affect the amount of time and individual attention provided by the instructor to the groups.

018

Expanding Energy Education in West Tennessee: The UTM Mobile Energy Classroom

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With the ever-increasing global food and energy demand, there is a definitive need to reduce the burden on available scarce resources, non-renewable energy being one of them. Expanding awareness among the public about renewable energy and associated benefits from its use is therefore a vital step in developing sustainable energy solutions for the future. Founded on the above premise, the UT Martin mobile energy classroom was developed as an educational and outreach endeavor to provide awareness and knowledge about alternative energy sources within the rural community in the west Tennessee region. The major objectives of this USDA-NIFA funded project were to design and build a mobile classroom aimed at providing a thorough overview of energy, explanation and demonstration of energy conservation, and the comparative use of various renewable energy technologies. The project also intended to help organize, develop and provide informational and educational teaching resources for use in universities, K-12 classrooms, community events and organizational meetings. Upon its launch in September 2016 at the Tennessee Soybean Festival, the mobile classroom has currently reached an audience number of more than 600 while displaying information on energy use at various local, regional, and state-wide events. Audience and community feedback suggests that the classroom has been instrumental in creating awareness about renewable energy education. The classroom serves as a unique educational resource for the rural west Tennessee region, and will continue to provide information on renewable energy to interested organizations and the general public in the future.

020

A National Collaborative for Food, Energy, and Water Education

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Land Grant institutions must take a leading role in preparing all global citizens for the food, energy, and water (FEW) challenges of today and tomorrow. The Food-Energy-Water Nexus concept has emerged as a unique opportunity to pursue a sustained, systemic, and interdisciplinary education and outreach initiative, including program evaluation and education research, focused on FEW issues. This effort spans a wide array of contexts, including K-12 and postsecondary classrooms, informal and non-formal learning environments, and in public spaces. The newly-established Multistate Research Committee - Collaborative for Research on Food, Energy, and Water Education (NCDC231) – will serve as a nucleus for transdisciplinary efforts to 1) advance FEW education and outreach efforts; 2) foster FEW education research; and 3) enhance collaboration around FEW education and education research. In this presentation, we discuss novel theoretical and analytical perspectives the FEW-Nexus concept affords by emphasizing coupled human-natural systems and science-informed decision-making as core elements of postsecondary teaching and learning within the FEW-Nexus. We illustrate these key themes with example programmatic elements and selected empirical data from multiple postsecondary FEW education programs at part-

ner institutions, including those showcasing innovative experiences for undergraduate students, faculty, graduate students, and the public. These results address NCDC231 research questions focused on learner outcomes, instructional approaches, and contributions to theory, and ultimately have important implications for the design of FEW education and outreach programs. This presentation will provide an overarching vision and orientation for other project-specific proposals submitted by NCDC231 members that illustrate examples of diverse FEW education efforts nationwide.

025

Making Connections between PK-12 Engagement and Expanding Access for Recruitment

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PK-12 engagement can serve as pre-recruitment to address the shortage of college graduates for agriculture, food, and natural resources careers. However, faculty have limited teaching experiences with PK-12 audiences. Purdue University's College of Agriculture's Office of Academic Programs and the College of Agriculture's PK-12 Council collaborate to provide workshops for faculty, staff, and graduate students interested in PK-12 Engagement. The purpose of the workshops is to highlight strategies for participants to engage youth in agriculture through outreach programs and increase youth interest to study agriculture and related sciences. The topics of the workshops for the 2016-2017 academic year were focused on making connections between PK-12 engagement and expanding access to underserved and underrepresented audiences. A voluntary questionnaire given to workshop participants (N=77) has shown that a majority of participants gained "a lot" better understanding of ways to connect with youth about agriculture and agreed "a lot" that they were interested in applying knowledge they learned in a workshop. These workshops helped current and future educators to learn knowledge and strategies to engage PK-12 students in agriculture and related sciences to increase PK-12 students' interests in agriculture as a field of study and future career.

026

African American High School Age Male Perceptions of Agricultural Programs in Urban Settings

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Agricultural related youth programs (i.e., 4-H, FFA) are designed to empower young people to reach their fullest potential and to develop skills and knowledge to make the best better in their lives. Little information exists regarding its effectiveness and perceptions of agricultural related programs among urban youth; therefore, this non-experimental study design investigated the perception of ethnic identity development, community involvement, and experiences among African American high school males (ages 13-18) in Philadelphia and how these factors influence their participation in agricultural related youth programs. A convenience sample of 300 African American high school age males were selected for the survey, and a random sample of approximately 20 participants were selected for the focus groups. The goals of this mixed method study are to (a) determine how young black males who participate in agricultural related youth programs and non-involved black males self-identify using the Multigroup Ethnic Identity Measure (MEIM-R) revised instrument; (b) identify how young black males involved in agricultural related programs and non-involved black males perceive community involvement; and (c) explore the experiences of involved young agricultural related black males differ from non-involved black males within similar urban communities. Based on these results, males felt gaining access to agricultural related youth programs were a barrier to participation due to other internal and sometimes external problematic issues that contribute to a lack of involvement. African American males' participation

in youth development programs is a worthy investment for both the individual and community. When young men participate in valuable experiences, they are placed in positions to build self-esteem, create personal networks, and improve their outlook on their studies and future. For program and teaching success, tools such as incorporating inclusivity and identity programming models (i.e., Cultural Rites of Passage), father-son interventions, mentoring, religious activities, and greater support of family and parental inclusion in teaching and afterschool programs.

Keywords: African American Male, Agricultural-related, Involvement

029

Developing Distance Learning Programs in Veterinary Technology Management

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The National Center for Education Statistics estimates that 14% of all college students are enrolled in distance education programs. This growing number is an opportunity for universities to expand their recruiting footprint and reach more students. Science programs have been primarily limited to traditional teaching methods due to laboratory requirements. Universities need to develop creative methods for delivering traditional programs in non-traditional formats to reach place bound students. In 2015, the University of Tennessee at Martin developed a new online veterinary technology management program to reach working students who wanted to continue their education. The program required a partnership between veterinary technology faculty and business faculty to provide a BS completion program to licensed veterinary technicians. Online coursework was developed to enhance existing technical skills covered in traditional veterinary technology associate degree programs with managerial training. Success measures for the program include training faculty to deliver coursework

online, targeted recruiting efforts, and collaboration between science and business faculty. Administrative issues include allocating new resources for online while not impacting on-campus programs while achieving faculty support for online programs among science based faculty. The new program is a success and can be a model for future programs to bring together diverse programs to create innovative learning opportunities for students. This project does not attempt to demonstrate that online programs are superior to on campus programs, but that they can be part of the solution to reach more students who are seeking additional training and broaden the student base of the university.

030

Impact of Indigenous and Background Agricultural Knowledge on College Students

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Agriculture is a very important part of our everyday life and as we are constantly surrounded with agriculture around us, children of today have a myopic understanding of what it entails. The idea of a farmer is the stereotypical old man with a farm, having a cow and a tractor. Agricultural knowledge is important to have, especially at a young age to be well educated about where and how our food arrives at the table, the best practices to employ for a more sustainable environment and the diversity of opportunities within the discipline. The objective of this research is to find out if college students can attribute and connect their indigenous or inherent knowledge of agriculture while growing up to their current knowledge of agriculture or if it was something they only learned in school. A survey including 25 items was administered to participants. These questions included basic questions about agriculture and they were scored after completion. The other 4 questions were demographic questions to determine the participants' background: rural/urban/sub-urban, farm/non-farm, domestic/interna-

tional student and major in school. The last question asked for suggestions on what could be done to increase their knowledge of agriculture. From the findings, academic majors and nationality indicate differences in the basic knowledge of agriculture. The conclusion is there might be a difference in the way agriculture is being taught in other countries. Also, Students from the arts and social sciences are less equipped with agricultural knowledge compared to the science and agriculture counterparts.

031

Student Perception of Trans-Institutional Cooperative Learning in an Animal Science Course

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The use of cooperative learning in STEM disciplines has been linked to increased student achievement and performance. With this in mind, faculty at Purdue University and Michigan State University (MSU) collaboratively developed the Advanced Animal Systems Management course. The course was designed to facilitate interaction among students at both institutions through shared course lectures/discussions, cooperative peer review of work, and a joint field experience. The objective of this study was to determine students' perception of the impact of trans-institutional cooperative learning on meeting the overall course goals and desired learning outcomes. A pre-survey was developed and administered during the first week of class to 11 students at Purdue and 9 students at MSU (100% response rate). All students were enrolled in the Advanced Animal Systems Management course. Student enthusiasm was high, with 95% agreeing or strongly agreeing that they were interested in the course content area. Ninety percent of students agreed or strongly agreed that they expected collaboration with students from the other university to be beneficial in the learning of course concepts

and principles. The majority felt that it would foster them to think differently about course content. In conclusion, initial data indicates that students believe cooperative learning between schools will be a worthwhile aspect of the course. Data collected at the end of the course will be evaluated to determine if perceptions changed from the beginning to the end of the course.

Keywords: Animal Science, Cooperative Learning

034

Agribusiness Student Learning through Conference Participation

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This study assesses various learning activities that Agribusiness students participate in while at the Southern Agricultural Economic Association (SAEA) annual meeting, including a Quiz Bowl, Research Poster Presentations, and Research Paper Presentations. The study focuses on undergraduate students' experiences while at the conference and how the conference increases their interest on graduate studies. In the SAEA Quiz Bowl, undergraduate students are placed in teams of 4 composed by students from all participating universities. Students learn from their peers about themselves and their universities, and compete in a jeopardy-like game where they answer questions related to their discipline (Micro-economics, Macro-economics, Agribusiness and Finance, Resource and Policy, Quantitative, Marketing, Management, and Potpourri). While at the conference, students also attend research poster and paper presentations. Students' reflections after the conference are highly positive: *"national conferences like theses helps us remember that agriculture is wider than just our university", "any expectations I had for the trip were immensely understated", "I feel more confident in my opportunities to attend graduate school", "I had never experienced being able to leave the state with a group of kids and a teacher outside of the state", "this trip was/will definitely be the*

highlight of my senior year of college at TAMUC", etc. The students' experiences were assessed through a post-conference survey and reflection papers. Overall, professional conference participation provides experiential learning activities for agribusiness/agricultural economics students.

035

Tools for Preparing Veterinary Technicians for College Success

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Programs requiring a licensing exam must prepare students in a step by step process that requires a combination of academic preparation for the licensing exam and professional mentoring for career success. Developing technical skills required by the American Veterinary Medical Association must begin at the freshman level. Innovative programs such as first year initiative programs can help students succeed in college, preparation for the national exam, and career success through high impact learning objectives and mentoring. Veterinary technology students have been enrolled in a first-year initiative class the first semester of college to help acclimate them to the profession. A critical part of the first-year initiative is mentoring students on the importance of exam preparation, soft and technical skill development and how each fit into the overall career path. Students are engaged in learning exercises that include professional speakers, reflection assignments, job shadowing and one on one meetings with faculty. Students are then assessed to determine their understanding of what is expected of them to be successful. Results of the 2016 class revealed that student perceptions of the industry and job expectations are changed as a result of the program. Soft skills such as time management, group skills, and conflict resolution were all improved after completing the experience. Students rated the importance of technical

skills higher than soft skill development. As a result, the program has adapted to include additional high impact experiences to reinforce soft skill development and how they relate to industry success.

038

Implementing Curriculum and Classes for One Degree with Two Locations and Two Specializations

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The University of Florida is in Gainesville, Florida, but our land-grant mission takes us all over the state delivering educational programs for citizens. When given the opportunity to expand program offerings to students in Plant City, FL who would enroll in our degree program, we faced decisions regarding how to best deliver quality instruction to our students off the main campus. We are delivering one undergraduate degree with two locations and two specializations with the help of two full-time Plant City campus lecturers who have become active members of our departmental faculty. Our Plant City lecturers are not just teaching our Plant City students; they are involved in teaching our students at the Gainesville campus, as well. We are engaging in hybrid teaching, team teaching and flipped teaching to facilitate a broad range of learning experiences. We are offering student organizations, industry tours, study abroad and other opportunities outside of the classroom for the students to engage with each other. We are continuing to innovate and evaluate our instruction each semester; seeking to build on what we are doing to raise the level of instructional quality for students on both campuses.

connect/develop/achieve

041

Theory Critique as a Methodology to Increase Critical Thinking Skills

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Studies have shown a deficit in undergraduates' critical thinking skills, and a lack of instructors' knowledge, skills, and abilities to teach at higher-order thinking levels. Increasing critical thinking skills is an objective many Colleges of Agriculture are actively trying to achieve, and as with any skill, one must practice improving. Forgoing a traditional cumulative final where lower-level thinking skills are predominantly used, an innovative assignment was created to challenge students to critically think about the agricultural leadership theories they studied over the semester. This assignment asked student to (1) identify a model or theory they have implemented or plan to implement, (2) tell why the theory resonated with them, and (3) how they could apply it in different situations. Then, students were asked to (1) describe a model or theory they did not agree with, (2) tell why they believed the theory was incorrect or not practical to use, and (3) what they would do to change the model or theory to make it better. The culminating paragraph asked them to reflect on and write about their thinking process, past experiences that led them to choose those theories, and how this exercise has changed their understanding of leadership theories. The objectives for the presentation are to describe the assignment and its ability to generate higher-order thinking and share the impact of the assignment on students' critical thinking skills. The data collected from 200 students showed an increase in critical thinking skills (specifically interpretation, analysis, evaluation, and self-regulation).

045

An International View of Agricultural Communications

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Agriculture has always been a global industry. For centuries, civilizations have traded and sold food and fiber products. As the industry continues to globalize, it is now more important to effectively communicate to producers, consumers, and other agricultural organizations in other countries. The purpose of this study was to determine what agricultural communications looks like in different countries so this information could be utilized in collegiate agricultural communications classes. Through the lens of the Diffusion of Innovations theory, a closer view of agricultural communications was achieved through qualitative interviews of international students studying agriculture at Texas Tech University. The researcher conducted qualitative interviews with nine international students, mostly from South American and African nations. Participants noted there was not a standard agricultural communications channel in their countries, even though many of the regions rely solely on agricultural production for revenue. Data show that communications with consumers, in general, is not prevalent, but change agents use various media to communicate with producers. Radio, mobile phones, and face-to-face communication are most prevalent in the countries represented in this study. Communication about agriculture to the consumer is needed in foreign countries, just as it is needed here in the United States. It is recommended education continue and communication increase about agricultural information to consumers and producers. This would benefit everyone to help understand agricultural products and the global impact of the industry.

049

Recruiting Pre-Vet Students into the Department of Poultry Science through an Avian Surgery Course

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Admission standards at The University of Georgia (UGA) have continually increased over the past 20 years. In response to this change, the Department of Poultry Science at UGA developed courses to assist with recruiting students, not traditionally interested in agriculture, into the program as well as a new major, Avian Biology. Several courses, like Laboratory Exercises in Biomedical Sciences (POUL 3000), were created to target the increasing number of students on campus interested in veterinary medicine. This course, POUL 3000, is unique by providing students with hands-on training in inducing and monitoring anesthesia, surgical techniques, pre- and post-operative patient care while mastering surgical procedures on anesthetized chickens. Exit interviews for graduating seniors indicate that POUL 3000 was a major factor that attracted students to major in Avian Biology. Thus, a Qualtrics® survey was designed and sent out to both current students enrolled in POUL 3000 (N=26) and former students (N=15) to assess the impact of the course on their choice of major, perception of poultry and animal sciences and their perception of how the course contributed to their development of 2013 National Association of Colleges and Employers Job Outlook (NACE) learning outcomes. The results indicate that the course is a successful recruitment tool for the department and the student's perception of exercising and meeting NACE learning outcomes was positive. Open response portions of the survey indicated that "word of mouth" about the "surgery course" was their impetus to major in Avian Biology.

051

Effect of Companion Animal Classroom Presence on Student Belonging

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The University of Wisconsin - River Falls' first year student body is comprised of 47% first-generation students, meaning students for whom neither parent has attained a 4-year degree. First generation students are typically more susceptible to financial, academic and psychological pressures that affect their capacity to persist and successfully complete a degree as compared to continuing-generation students. One factor that may play a role in increasing persistence and institutional attachment among all students, including first-generation students, is social belonging. This research project sought to explore the possible link between the presence of a companion animal (dog) in the classroom and students' sense of belonging. We examined whether or not the presence of a companion animal in the classroom would increase students' sense of belonging. Student surveys were administered in 2 x 2 study design (control - test populations, pre- and post-course survey tools) measuring student's enjoyment of the course, learning, and belonging. Comparison of the two student groups revealed no significant difference in the measures of course enjoyment, learning or belonging. Instead both control (no animal) and test groups (animal present) demonstrated significant gains in levels of belonging (measured as both feelings of classroom and university community) suggesting that the presence of a companion animal in the higher ed classroom neither negatively nor positively impacted student belonging.

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053

The Impact of Short-Term U.S.-Japan Student Exchange Experiences

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Innovative and high efficiency agricultural techniques are required to keep up with the world's growing population. Maintaining a global and multicultural perspective is becoming increasingly important for upcoming professionals to remain competitive in the field of agricultural and keep pace with these global demands. International student exchange continues to provide a means of fostering these ideologies. In the summer of 2016, an international student exchange occurred between University of Hawaii, Kauai Community College (KCC), U.S, and Obihiro University of Agriculture and Veterinary Medicine, Japan. Five undergraduate KCC students enrolled in an advanced Plant Biology and Tropical Agriculture course (PBT 290V), visited Obihiro University. The course was structured around the presentation of research projects to Obihiro University students but also included tours of the local farming industry, cultural outings, and guest university lectures. Post trip, students reflected on their experiences and prepared their research findings for future publications in peer-reviewed journals. A summary of the post-trip reflection had been documented as students' take-home message on several agricultural disciplines such as Integrated Pest Management and temperate zone Japanese crop husbandry, and presented at community events such as 2016's Kauai Conservation Expo. Through these experiences, undergraduate students were exposed to cross-cultural interactions, regional specific crops and farming methods, different agricultural economic models, and a holistic understanding of preparing and presenting research findings. Additionally, inter-university relationships were established to allow future exchange of knowledge and academic collaborations between students and faculty, ultimately strengthening the collective competitiveness of both institution's faculty and students.

055

Science in the Agriculture Classroom

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Educational reform movements have increased pressure to improve student performance in science, technology, engineering and mathematics. Interestingly, agriculture's relationship with the biological, chemical, and physical sciences has well-positioned agricultural education to enhance scientific skills and knowledge. The purpose of this study was to describe preservice agricultural education teachers' perceptions pertaining to the science concepts found within the secondary agriculture curricula, perceptions of science integration, and the science integration currently taking place in secondary agriculture classrooms. After completing a 40-hour early field experience practicum, 26 preservice teachers participated in a focus group to reflect on their observations of secondary agriculture classrooms, and the following themes emerged from the data: (a) agriculture as a context for science, (b) hands-on learning opportunities, (c) practical applications, and (d) colleague collaboration. Findings indicated integration of science concepts were reliant on perceived integration ability, belief in the importance of science knowledge, perceived consequences of science integration, application of hands-on learning techniques, perceived practical application of science in agriculture, and peer collaboration. Preservice teachers cited specific instances of core academic science concepts relating to agriculture, which they perceived as an applied science. While there were natural ties to

biology and chemistry noted, preservice teachers held a belief that agriculture was unique in terms of having the ability to develop strong, practical contexts for learning and integration, but they believed too much science integration might threaten agricultural education. Agricultural teacher education programs should provide guidance on when to use agriculture as the context and content of instruction.

057

Pre-Laboratory Handouts and Quizzes in an Animal Reproductive Physiology Laboratory Course

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Using a flipped classroom method has shown to increase student achievement, interest, and engagement, while allowing for classroom time to be used more efficiently. Therefore, pre-laboratory handouts and quizzes were evaluated in a reproductive physiology course's laboratory section as tools to enhance student learning. Eighty-six students were enrolled in the course and all received the same pre-laboratory reading one week before the corresponding laboratory for a total of ten weeks. Student performance was evaluated using pre- and post-quizzes on the day of the laboratory, as well as, a laboratory practicum that reflected material from both handouts and laboratory exercises. Students were surveyed at the end of the semester using Likert scale questions to determine their perception of the handouts and quizzes (61% response rate). Results were analyzed using Pearson's correlations. There was a positive correlation between students' scores on pre- and post-quizzes ($r = 0.331$; $P = 0.002$), as well as, pre-quizzes and laboratory practicums ($r = 0.524$; $P < 0.0001$). The handouts and quizzes were well-received by the students with 85% recommending keeping them as part of the course. Additionally, 94% of the students felt that the handouts and quizzes prepared them for the laboratory activities and 69% felt they improved their practicum grades. Also, 90% felt the handouts and quizzes boosted their confidence in the laboratory activities. These results suggest that the pre-laboratory handouts and quizzes are a helpful tool for the students in preparing for laboratory-based course content and warrant additional evaluation.

058

Preparing Future Agricultural Sciences Faculty: An Evaluation of a Cohort Program

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This qualitative study investigated the educational outcomes of a three-year cohort program that supports the development of pedagogical skills of PhD students in the College of Agriculture and Life Sciences at a Land-Grant University. Interviews and focus-groups were conducted with current program participants, the Scholars (n=5), program alumni (n=5), faculty mentors (n=4*), and administrators (n=5*), the asterisk represents one individual who served in both roles. Five themes were developed. They are: Theme 1. Participants Perceptions and Experiences of the Components of the Program, Theme 2. Recruitment & Finding Successful Scholars, Theme 3. Development of Community of Practice, Theme 4. Preparation for a Career in Academia, and Theme 5. Areas for Improvement. The evaluation developed a list of implications for program planners to consider, including: who should participate, length of the program and how the program should be implemented.

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059

The Impact of Visual Reflections on Student Stress and Teacher Immediacy

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Research has established that reflection is an instrumental part of the learning process, as it allows individuals respond to and evaluate their learning experiences. Nonlinguistic reflection encourages students to use alternative mechanisms, such as visual imagery, to express their perceptions or understanding of a concept. Previous investigation has indicated that both online and face-to-face graduate students perceived visual reflections to be a positive addition to their Research Methods course. The purpose of this study was to determine the impact of visual reflection on students' affective learning, academic stress, and perceptions of teacher immediacy. Objectives were to 1) describe the affective learning, academic stress, and perceptions of teacher immediacy among students who did not engage in weekly visual reflections during a research methods course and those that did; and 2) determine the differences in mean scores of each variable between the two groups. Online and face-to-face students enrolled in the course were randomly assigned into a control and treatment group, in which the treatment group submitted weekly visual reflections. Students' mean scores on affective learning, academic stress, and perceptions of the instructor's verbal yielded no significant differences between the two groups. However, the uniformly high mean scores for each of the areas indicated possible ceiling effects. The disparity between previously reported qualitative results and the findings herein suggests that students without visual reflections may have found other coping mechanisms to manage their academic stress and maximize their performance, but that they may have enjoyed the visual reflections for other, yet-to-be-measured reasons.

066

The Value of Study Abroad: The Growth of Global Citizens

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College Study Abroad Programs are important for students' personal growth, intercultural development and global awareness. Benefits can be life-changing and provide numerous educational and career opportunities regardless of destination, duration or endeavor. This study included a diverse group of undergraduate students from University of Illinois. Male and female students from both urban and rural communities participated in various study abroad programs with varying lengths, differing countries and a variety of purposes. The faculty lead study abroad programs included a 3-week trip to South Africa and a 2-week trip to Tanzania. Students in South Africa experienced cultural immersion, historical tourism and service learning. In Tanzania, students experienced field research, safari and wildlife conservation. Students reported on pre-course and post-course surveys: Interethnic communication apprehension scale (PRECA), intercultural communication apprehension scale (PRICA), intercultural sensitivity scale (ISS), personal social values scale, community service self-efficacy scale, Munroe multicultural attitude scale questionnaire (MASQUE) and Global Perspective Inventory (GPI). Findings indicated students increased in all scales. The comparison of post-trip reflective essays with pre-trip expectations of students found improvement in personal growth and development, and increased acceptance of different races, ethnicities and cultures. Results emphasize the importance of benefits gained from Study Abroad programs for college students. Students experience personal growth, gain global perspectives through intercultural collaborations and develop more acceptance and understanding of all people.

069

Study Abroad and Student Exchange Program in Agriculture and Its Impact

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The 1982 Florida Task Force found the study abroad has been recognized as a process that provides students and individuals with the knowledge, skills, and attitude necessary for them to meet their responsibilities as citizens of their community, state and nation. Additionally, the importance of short-term study abroad and student exchange (STSASE) programs in agriculture education has been documented in several publications such as NACTA Journal and Journal of International Agricultural and Extension Education. In Summer 2016, five Kauai Community College (KCC) students visited Obihiro University of Agriculture and Veterinary Medicine (OUAVM), Japan for one week for an international agriculture exposure, on-site Integrated Pest Management (IPM) and production agriculture training, and student presentation. In Fall 2016, another one-week long similar training and exposure program was organized for five OUAVM students at KCC. The STSASE program had taught temperate and tropical agriculture to the undergraduate students of KCC and OUAVM, respectively. KCC and OUAVM students and faculty discovered taro leaf blight (*Phytophthora colocasiae*) infected taro field on Kauai and planned for a collaborative experiential learning project for future. Thus, the STSASE program increased institutional relationship and faculty collaboration between KCC and OUAVM. Moreover, enrolment of 91%more students on Plant Biology and Tropical Agriculture (PBT) courses in Fall 2016 (N=65), compared to Fall 2015(N=34) could be an additional impact of the STSASE program.

070

Preservice Agricultural Education Students' Emoji-Based Reflections

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Reflection is a best practice in education; its impact on learning cannot be disputed. With a recent surge in technological communication, the ubiquitous language of emojis has swept the world. The purpose of this innovative practice was to describe students' use of emojis when reflecting on internship experiences. Objectives were to describe the frequency and type of emojis used and describe students' perceptions of the emoji reflection experience. Preservice agricultural education students were asked to reflect on their student teaching internships using emojis. This reflection exercise occurred once a week through an online classroom. At the beginning of each class, students were asked to text the instructor using only emojis, and then each student was given the opportunity to verbally explain why they had selected their particular emoji(s). Students used this discussion as an opportunity to relate their classroom experiences to their peers, and the instructor used the discussion to formatively assess students' development in their internship experience. Students sent 33 different emojis throughout the experience, with an average of 3.5 emojis per response. The most commonly used emojis were the loudly crying face, upside-down face, thinking face, tears of joy face, and the smiling with sunglasses face. While one student found the exercise to be unnecessary, other students noted that the use of emoji reflections was a positive experience.

071

Early Influencers of Student Success in an Introductory Genetics Class

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Engagement is a crucial predictor of student success in learning. This study evaluated the impact of early engagement in an introductory genetics class (n=237 in two sections). Scores from the first five weeks (pre-test, in-class group projects, individual 'clicker' questions, and the first homework and exam) were sorted by end-of-semester letter grade and correlated with end-of-semester point totals (PT). Online components (pre-test and homework) were also rated based on earliness of the submission. Scores for most components, including earliness ratings, generally assorted consistent with letter grade category. The exam score was the strongest predictor of student success (r=0.817), with homework a distant second (r=0.604). Earliness of homework submission (r=0.295) showed a weaker correlation to PT than did the actual score. An opposite trend was observed for the pretest: correlation to PT was higher for earliness (r=0.269) than for actual score (r=0.185). For in-class projects, the mean score for completed projects was less predictive (r=0.269) than the number of projects completed (r=0.393). Similarly, clicker-question correlation was stronger for participation (r=0.569) than for mean score among completed questions (r=0.440). Compared to group submissions, scores for individual assignments had a higher correlation to PT, suggesting that group work may give an inflated estimate of understanding. However, these comprehension-based instruments underline the well-known importance of student involvement in learning, even if responses are inaccurate. Overall, the data suggest that independent learning is a key facet of information retention, and that promptness and individual motivation are contributing factors for student success in learning.

074

IHSA Program Characteristics and Practices Leading to the Most Competitive Successes

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The Intercollegiate Horse Showing Association (IHSA), is a collegiate horseback riding program offering experiential learning opportunities to 9000 participants in North America. Our objective was to identify differences in IHSA program management styles and specific characteristics contribution to team success. A 50-question survey consisting of yes/no and open-ended questions was deployed to all participating IHSA teams. The survey unveiled that out of the 21 responding colleges, 55% of colleges with an IHSA program have both a western and a hunt seat team versus only one team. The average team size was 28 students. Furthermore, 33% of the schools stated that their IHSA team increased overall college enrolment. Also, it was revealed that on average 45.35% of IHSA team members attended their school purely because the school had an IHSA team; accounting for an average of 13 additional students each year. On average, schools provide 86.1% of IHSA teams' annual operating budget. To account for competitive success, both individual and team national placings for each college were correlated into a 'success score'. With that, 54.5% of school's host practices on-campus and have an average success score 6 times greater than their off-campus counterparts. The average success score for schools with required weekly workouts was nearly triple compared to schools that did not require workouts. Identifying how different programs are managed and which IHSA program characteristics lead to the most success, we can be more mindful in our allocation of resources when evaluating the program structures of both new and existing teams.

076

Career Skills Gained from a Short-Term Study Abroad

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Objectives of the current study were to evaluate student knowledge gain and skill development from participation in a study abroad opportunity. A 14-day faculty-led equine business study learning experience in Ireland was offered to New Mexico State University students (n=16) in Spring 2016. Students completed a pre-test prior to traveling internationally concerning equine business, the equine and agriculture industry, and the country of Ireland. Students participated in daily journaling, group blogging, and equine and agriculture business lectures during the experience. After returning from the study abroad, students completed a post-test, career skillset questionnaire, and a global awareness questionnaire. Students reported enhanced oral communication, dependability, reliability, work-ethic, horse knowledge, marketing knowledge, and self-confidence because of the experience. Students indicated the experience made them more globally aware, shed light on career opportunities, and enhanced their view of other cultures. Students were also asked to indicate how they would report the experience to a potential employer on a resume or in an interview. Student responses suggest they are ill-equipped to accurately present the positive benefits of study abroad on their personal growth and career skillset development. It is suggested that study abroad instructors assist students to connect experiences to specific skillsets and attributes employers deem important.

078

Exploring Extension Experientially in an Undergraduate Swine Course

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Capstone management courses in Purdue Animal Science are designed to give upper-level students an in-depth study of animal production of certain species. Students are challenged to develop potential solutions to an industry problem in the end-of-course project. The students in the swine capstone course pick from three options for the end-of-course project; two of which are described in this study. In the first year offered, students (n=15) either design and evaluate a set of activities for high school students or evaluate a current swine youth event. Students use the evaluation and their impressions to create a similar event that could draw 50% more youth to the innovative program. Kolb's experiential learning model emphasizes the continuity of the learning experience. In experiential learning the student has a concrete experience, engages in meaningful reflection, draws conclusions from what was learned, and demonstrates what they learned in a real-life situation. This innovative teaching idea allows students to use experiential learning to gain exposure to species-based youth events, and learn about designing and evaluating programs. This broadens upper-level students' experiences outside of commercial production and provides an opportunity to work with the public, relaying livestock production information. Through these project options, students gain exposure to extension events and have opportunities to interact with those in careers that teach youth about swine. This experiential learning opportunity was well-received by students with an interest in education, extension, and those that were interested in working in aspects of the swine industry other than commercial production.

079

Creating and Implementing a Peer Mentoring Program in a College of Agriculture

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As students enter college, they must adapt to a new environment that is often less structured than their previous educational experiences. Integrating into college life may be difficult for some students who are struggling to balance their new-found freedoms and the responsibilities associated with higher education. Trends in education suggest peer mentoring programs act as an effective mechanism to increase student engagement and participation and provide targeted support. Peer mentoring programs are often characterized as extra-curricular. However, student involvement theory supports the development of intra-curricular peer mentoring programs, as Astin's Theory stresses the use of dynamic learning tools to increase motivation, in place of traditionally passive modes of instruction. Student involvement theory shifts the educator into the position of facilitator, with the ultimate goal of influencing students to actively participate on their own. The mission of the Dale Bumpers College of Agricultural, Food and Life Sciences Honors Peer Mentor Program was to provide intra-curricular and extra-curricular support to incoming freshmen honors students. A group of seven upperclassmen honors students were selected to serve as peer mentors. Research shows that a low mentor-to-mentee ratio is beneficial to relationship building. The Honors Program graduate assistant collaborated with the retention coordinator in the Honors College to coach peer mentors on leadership and relationship building techniques. Peer mentors engaged students in the classroom in groups of six and met with students periodically throughout the semester outside of the class room. Freshmen students reported feeling more connected to their classmates. Peer mentors expressed overcoming challenges of engaging students, facilitating discussion, and managing diverse personalities.

084

Critical Thinking Expressed During a One-Month Study Abroad

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"According to Russo and Osborne, globally competent students will become globally competent citizens." Study abroad experiences can significantly influence a student's life. Through these experiences, students are able to gain important skills that can enhance their employability in the short term and can help enhance a person's ability to relate to others through increased intercultural skills and communication. Additionally, their ability to reason through critical thinking skills can directly be influenced through a student's participation in a study abroad experience. In order for students to reach their full potential in society, it is important for them to be able to learn to think and reason critically. Critical thinking can be categorized into skills with additional sub-skills considered to be essential for critical thinking. Study abroad can enhance many, if not all of these skills. Students participating in a month-long study abroad to India to study non-profit leadership were asked to reflect throughout their trip. Using guided reflection prompts, it was found that students use of critical thinking skills varied through the duration of the trip. Early in the trip, students found interest in examining their new environment and comparing the US experience to the Indian. However, there is a point when students begin contemplating the impact of the trip on their return home, which appears to prompt elements of the skills related to evaluation and self-regulation. Overall, it was clear that students were practicing their critical thinking skills, as they related to experiences during their trip.

085

Workforce Partnerships: Investing in Education and Industry

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Kansas is developing creative approaches to bridge public and private resources to the benefit of agriculture education and workforce development. Investing in agriculture education is a proven way to build a solid foundation that supports the Kansas Department of Agriculture's (KDA) mission of creating a "best-in-state plus" workforce and work environments with a positive culture and attitude. One piece of the equation includes internship opportunities as a great transition to full-time employment and a knowledgeable future workforce. The agency's agriculture workforce development vision is one that recognizes the importance of Supervised Agriculture Experiences in high school, post-secondary internships, and purposeful job placement inside the Kansas agriculture industry. KDA continuously seeks input from farmers, ranchers, agribusinesses and educators who have a vested interest in keeping the Kansas agriculture sector healthy. Public-private partnerships with agribusinesses in the state are key to the successful growth of the agriculture industry. In 2016 and 2017 KDA partnered with Cargill, Caterpillar Works and Servi-Tech to connect these companies with secondary and post-secondary agriculture education programs within their service areas, for the purpose of recruitment, training and to supply schools the necessary resources to train future employees. KDA is committed to supporting agriculture education by serving as the bridge that links business and industry with educators and students. Educators at all levels in agriculture can play a pivotal role in creating similar public-private programs in local communities and in the state.

087

Engaging Agriculture Students through Living Learning Communities

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Living Learning Communities (LLC's) enhance educational experiences for college students. LLCs have been shown to increase student's academic and social engagement, ultimately leading to positive educational outcomes. The use of residential dorms to connect students in common degree programs allows universities to develop targeted educational opportunities for students, increasing the student engagement to their chosen degree and the academic department. While LLCs have been utilized for many years, their use in agriculture programs is limited. During the Fall 2016 semester, the College of Agriculture and Applied Sciences at the University of Tennessee at Martin initiated an Agriculture Living Learning Community in a dormitory with 56 students. The new initiative required a coordinated effort among multiple campus entities, including housing, academics, administration, and faculty. The LLC was equipped with newly furnished study rooms, media equipment, and common area. Students had 24/7 access and some faculty held office hours and study sessions in the LLC. The university intends to determine the effectiveness of the LLC. A survey was conducted to assess student perceptions of the effectiveness of the LLC and help improve future programming. Student responses were positive with 72% of students stating that the LLC improved their academic experience. Ninety percent of students indicated social and networking experiences were improved by participating in the LLC. Students also expressed more connection to their academic major from the experience. One negative found was that only 27% of students felt that they were better connected to the faculty as a result of the experience.

088

Impact of Student Demographics on Confidence of Critical Thinking Proficiency

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A key desired outcome of undergraduate education is improvement in critical thinking, but barriers exist for student confidence in its achievement. The objective of this experiment was to evaluate how demographic classifications impact a student's confidence of their critical thinking ability. Students in an experiential course-based undergraduate research class completed a 20-question survey ranking their confidence of critical thinking proficiency. First generation college students tended to have less (P=0.10) confidence in their overall critical thinking ability than their peers, and reported being significantly less (P=0.03) aware of how their up-bringing may prejudice fair consideration of an issue. Conversely, students who had at least one guardian or grandparent as an alum of the university they were attending reported being significantly more (P=0.04) aware of how their up-bringing may prejudice fair consideration of an issue than those who were not university legacy students. Gender, transfer status, or state of residency did not impact (P>0.10) student confidence in their critical thinking ability. Pearson correlations revealed that GPA had a moderate positive correlation (R=0.310) with confidence in critical thinking ability, but total number of completed academic credits or transfer credits from other institutions had limited correlation (R<0.15). These data demonstrate that demographic classifications can impact student confidence in critical thinking proficiency, which is important when analyzing self-reported critical thinking ability. Further research is necessary to identify how demographics and student confidence in critical thinking is associated with measured ability.

091

Stressful Success: CDE Preparation Viewed through Physiological Stress

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School-based agriculture (SBAE) programs are not immune to the stress-inducing circumstances on the rise in public education. These include increased calls for accountability, precarious financial situations, organizational stress, and a crisis in supply and demand. Although SBAE teachers experience high job satisfaction, high levels of stress exist, specifically related to preparing Career Development Event (CDE) teams. The purpose of this concurrent triangulated (QUAN+QUAL) mixed method study is to contextualize the experiences of CDE coaches and participants during state level CDE competitions through the lens of stress and resilience. The central question is: What is experienced related to stress and resilience during state CDE competitions? Three previously successful agriculture teachers were sampled (n=3), along with three CDE teams (n=10), preparing for and competing in the state competition. Quantitative data was obtained from ambulatory heart rate monitors that triangulate stress and recovery responses. Qualitative data was obtained from daily activity journals and researcher field notes. A researcher trained in analysis of physiological indicators interpreted the quantitative data and the journal entries were coded using a critical incident technique. Within the 24-hour time period around the state competition, all teachers exhibited high stress reactions (39%-79%) and experienced little to no recovery (0%-36%). Similarly, students experienced stress reactions between 29% and 70% of the time and exhibited little recovery (4%-31%). It is recommended that professional development be developed to assist teachers and students in better coping with CDE related stress and resilience.

099

Use of Extracurricular Activities to Augment Agribusiness Education

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Unlike other disciplines in agriculture, agribusiness courses often do not have a direct laboratory component to help facilitate hands-on learning. The use of market simulators can help narrow the laboratory gap between agribusiness and other agricultural disciplines, however simulation developers must balance realism and complexity in the design process. Oftentimes, student reception of the use of simulators is mixed due to time commitments involved for successful completion as well as assignments are team-based where freeriding is a pressing concern. Encouraging students to participate in extracurricular activities allows for combining realism and complexity of real-world problems while being mentored by faculty. For agribusiness faculty, incorporation of quiz bowls, case study competitions, and marketing pitch events into their curriculum can expose students to learning outside of the classroom. The use of experiential and problem-based learning techniques reinforces connections to the real-world that students may not grasp via normal classroom interactions such as lecturing and exams. An added advantage is the improvement in students' soft-skills, a trait highly sought by employers. Regarding, the marketing pitch event, students take ownership of the marketed product as they make decisions on the major marketing questions. Incorporation of these activities adds a selling point during recruitment as students are engaged in not just another club, but in an effort, that results in marketable skills and highly valuable networking opportunities. Extracurricular activities can therefore provide a dynamic alternative to in-class simulations by enhancing student engagement while adding practical and tangible value to instruction.

100

Applying Vygotsky's Advice to Promote Leadership Learning

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Vygotsky's (1978) zone of proximal development (ZPD) is the space in which educators spend most of their time; fostering learning and development through challenging tasks that are slightly beyond students' current capabilities, but still achievable with additional guidance. When designing assignments, educators should take care to consider both content and structure with regard to student proficiency, in order to keep the assignment in the ZPD. In an effort to keep students engaged and challenged, an innovative assignment was developed and implemented in a foundational agricultural leadership course. The structure of the assignment required students design an infographic using the online software Piktochart, or similar program. They could work in pairs or as individuals. The content of the infographic was to illustrate how a specific leadership theory or concept could be applied within the context of a complex agricultural problem. The activity required students to articulate their knowledge of a leadership concept of their choosing, while depicting its value in addressing a complex agricultural issue identified by the student, using the format of an infographic. After receiving feedback from their initial submission, students could revise and resubmit. Twenty-two students received passing grades, six earning 100%. One student did not submit an assignment, while five students did not earn passing grades. Students indicated they enjoyed the non-traditional and challenging nature of the assignment, but would recommend clearer instructions and examples that represented the instructor's expectations. Additionally, more thorough instruction and guided practice using the infographic software was recommended.

101

A Cross Cultural Immersion Experience in Agriculture Teacher Prep

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As the country becomes more diverse, it is important for teacher preparation programs to prepare future educators for a wide range of students. As schools are put under more pressure, preservice teacher programs must find ways to prepare teachers who can educate a diverse population in various settings. The purpose of this presentation is to describe the process used to introduce, facilitate, and evaluate a cross-cultural immersion experience with preservice teacher candidates and recommend best practices for others hoping to implement the experience. The criteria professors used to select urban agricultural education programs were: (1) school/program must have a large percentage of non-traditional (particularly youth of color) students, (2) be located in an urban setting, (3) have a demonstrable reputation of having a program with participation in Supervised Agricultural Experiences (SAEs), and Career Development Events (CDEs). Once identified, programs are contacted and visitations were scheduled. The cultural immersion project is completed by visiting the program. Preservice educators get the opportunity to tour the school, and facilities while having the opportunity to interact with students and teachers. After the visit, students are debriefed about their experience. Preservice teachers saw the initiative as an eye-opening experience. Many were aware of these programs but didn't know they encompassed so much. Furthermore, many of the students never had a meaningful conversation regarding diversity and the development of their thoughts and feelings towards diverse cultures and settings. As such, students need professors who will stimulate, investigate, and guide their thinking throughout the engagement.

105

PhotoVoice for Empowering Students and Evaluating Hands-On Learning

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PhotoVoice is a participatory community research method, first introduced by Wang and Burris in the public health field. Its original uses included needs assessment, asset mapping, program evaluation, and research. Instructors have also used it as a teaching method in the social sciences. It has not however, been widely used within agricultural education. For this study, researchers used PhotoVoice as a qualitative evaluation of student learning to understand student cognition around food they grew in the school garden. Elementary students documented their "learning" and "doing" experiences in the garden through photo-taking and narrative writing. Students coded groups of photos through small group discussion. Researchers coded student photo narratives and identified major themes, including science learning, garden tasks and skills, the school garden as food, and personal growth. These broad themes were present at each of the three schools in the study, though different iterations emerged at each school as a reflection of the teacher's issue based motivations for gardening in addition to academic learning. Beyond a valuable research method, researchers also found this method to be important as pedagogy. PhotoVoice was an empowering way for students to reflect on learning, and to connect concrete, hands-on learning with abstract ideas. The authors found PhotoVoice useful not only to evaluate learning, but also to promote critical thinking and communication skills. While elementary school students documented their learning, and doing in this study, the methodology could be used by agricultural educators in middle and high schools, as well as colleges and universities.

106

Student Readiness and Progression in a Plant Science Course

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Persistent disparities in students' level of preparation and the need to provide adequate training to propel them to successful graduation, demands that they be assessed for their knowledge and competency skills, including critical thinking and problem solving early in their studies. The scientific method used in labs is one mode through which these skills can be partially developed or enhanced. Thus, we administered a pretest to freshman students enrolled in an introductory 16-weeks plant science lab with the objective to determine their basic scientific knowledge and scientific method literacy before and after taking the class. In fall 2016, students in two labs were administered a 20-question test at the beginning and the end of the semester. This test contained 14 questions on basic plant knowledge and seven questions on the scientific method. No credit was given for completing the activity which was graded on a scale of 0-5, where 0, 1, 2, 3, 4, and 5 were no answer, incorrect, 25% correct, 50 % correct, 75 % correct, and 100 % correct, respectively. Students self-reported that the number of their science courses completed prior to the class was average of four. Basic plant and scientific method knowledge literacy were 1.8 and 2.4 at pretest and increased to 3.0 and 3.9 at the end of the class, showing significant increase in scientific gain on these two parameters. Our results indicate that while students made some progress, there is a need for further improvement to fully realize their expected competencies.

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Building a Model Experiential-Based Agricultural Food Safety Program

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An essential component of the agricultural system is food safety and, unfortunately, educational opportunities in this growing field often lag behind industry needs. We have initiated an educational partnership to create new opportunities for students at the high school and community college levels who are interested in pursuing a career in agriculture. The goal of this project is to develop a model program for enhancing community viability through connecting STEM education in agriculture, career exploration, and local workforce development in the agricultural food safety sector. It serves as a catalyst for innovation in developing cooperative linkages between secondary schools, two-year postsecondary institutions, and agriculture industry partners in Carroll County, Virginia. Through this project, partner institutions are working together to create cutting-edge educational opportunities for students based on situated learning theory, experiential learning models, and current knowledge of student learning in inquiry-based environments. Results from the first year of the project indicate early successes at the high school level. First, pilot implementation of a high school agricultural food safety internship program resulted in planning for a new orientation program, increased parental involvement, and formalization of expectations for interns. Second, revision of an agricultural biotechnology course led to increased utilization of a

STEM Lab for Agriculture and lessons that employ a food safety context for standard biotechnology concepts. This project was supported by the Secondary Education, Two-Year Postsecondary Education, and Agriculture in the K-12 Classroom (SPECA) Program of the National Institute of Food and Agriculture, USDA, Grant #2016-38414-25825.

109

Food Defense – A New Consideration for Inclusion in Food Safety Curriculum

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Food Safety classes have traditionally not included Food Defense in lesson plans. Changes in the FDA's Food Safety Modernization Act (FSMA) have made Food Defense plans mandatory for food processors. Whereas Food Safety planning focuses on unintentional contamination of food, Food Defense focuses on intentional contamination. This presentation discusses needs for a course in Food Defense, student interest, current knowledge, and how to prepare students for Food Defense requirements. A questionnaire was administered to a class of students (n=18) taking Food Safety to gauge knowledge and interest in Food Defense. When students were asked how relevant Food Defense would be in their future career, 69% indicated it would be useful, 25% indicated necessary, and the remaining students did not believe it would play a role in their future career. Seventy Five percent described their knowledge of Food Defense as lacking. The proposed material addresses the information about the types of adversaries, and the related counter strategies and tactics unique to intentional food adulteration. Opportunities for certification in Food Defense are extremely limited, often expensive, but highly sought by students. Eighty one percent of respondents felt a certification opportunity would increase the likelihood they would enroll in a Food Defense course.

Faculty teaching Food Safety classes in the Department of Poultry Science at AU have started to incorporate Food Defense Planning, utilizing FSMA guidelines, and student response to the introduced material has been favorable.

111

Exposing Problems Teaching Students Morphological Species Identification

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A dichotomous key guides the user through taxa determination for a specimen by providing a series of dual-choice nodes that center around morphological differences. Each nodal choice leads to either a new set of dichotomous choices or a taxa decision. Over the course of two separate lab modules, we evaluated student's ability to utilize a dichotomous key down to species identification, by reviewing their nodal decisions along with their confidence level. For each decision the student made, they ranked their confidence level using a Likert scale (1-5). Along with individual decision recording, students also conducted a post-decision comparison with their partner, following a think-pair-share active learning model. If their answers were not the same, they re-evaluated their decision making, along with a re-analysis of the specimen until a mutual evidence-based decision was reached. How successful the students were in making the correct identification was analyzed as well as the correlation between confidence and accuracy. We observed high confidence in their decisions although student accuracy overall was fairly low. Even though no significant difference was found in accuracy between male and females, we observed a higher initial accuracy from students enrolled in STEAM majors when compared to non-STEAM majors. From these data, we aim to improve student training in the use of dichotomous keys for species identification, with a continued approach that can be then used to provide guidelines for how forensic entomologists should approach dichotomous keys in their work.

112

Secondary Agriculture Educators' Perceptions of the Importance and Capability of Teaching Agricultural Food Science

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Maintaining the nation's food supply has become a critical trend researched across the nation, yet food and meat science is not emphasized in the curriculum in secondary education. The content is covered in certain classes in the state of Texas Agricultural Science course inventory, but the offering of the courses is limited due to lack of facilities or student interest. College students who are studying to obtain an agriculture teaching certification are not well trained in areas of food science due to limited college course offerings or the food science curriculum not appearing on the respective college degree plan. This study sought to identify the importance and ability levels perceived by agricultural educators on selected skills associated with Food Science. The following research objectives were used to fulfill the purpose of this study: 1) describe the demographic characteristics of participating agriculture educators; 2) describe the importance of selected agriculture food science content areas as perceived by secondary educators; 3) describe the perceived capability of secondary agricultural educators to teach agricultural food science content areas; 4) determine the discrepancy between the importance of agricultural food science content areas and the capability to teach agricultural food science areas as perceived by secondary agriculture educators. Results from the research indicated that majority of the agricultural educators needed professional development in all six Food Science constructs. Most importantly, the research found that professional development was highly needed in the Hazard Analysis Critical Control Point (HACCP) construct.

115

Does Testing Type Matter? Instant Versus Traditional Feedback Methods

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Although traditional and instant feedback methods are assessment approaches utilized by educators today, educational researchers still struggle to understand the impact of testing method on student learning. While both traditional and instant feedback methods will be discussed, recent research would suggest that immediate feedback provides better retention of information and therefore better student performance. To explore this effect, students enrolled in an undergraduate course focused on leadership theory at a Southern land grant university during the Fall 2014 semester were studied. A total of 200 students were enrolled in the course. A quasi-experimental research design was utilized to compare student performance on course exams and a final exam that considered testing type of traditional (scantron) and instant feedback using the Immediate Feedback Assessment Technique (IFAT). Students completed four course exams during the semester using response formats that provided delayed feedback or immediate feedback. The comprehensive final examination consisted of 50 items, with 20 items being identical to items from the previous four course exams. Scores on each of the four course exams, did not differ in their performance by test method. Results showed the immediate feedback method had a minimal positive, but non-statistically significant, effect on student performance as compared to the traditional method.

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Insight on Reducing Writing Apprehension through Planned Interventions

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The ability to write well is consistently ranked among the top skills sought by employers seeking four-year college graduates. A recent survey found 93.1% of employers ranked written communication as "very important" skill for new hires. Agricultural degree programs aim to ensure written communication proficiency in technical subject matter by means of the writing intensive course. Students must master the content knowledge of the course and translate it into a written format. However, students are known to have anxiety related to writing and writing assignments. Anxiety can prevent students from improving their writing skills. One common practice for teachers to support students and maximize their writing is through planned interventions to build confidence and skill. What is not known is which types of interventions students view as more efficacious, which do they prefer, and if there is a distinction between interventions and course structure regarding a lessening of writing anxiety. This study seeks to answer those questions by utilizing Daley and Miller's Writing Apprehension Test as a pre- and post-test to measure students' writing apprehension before and after a series of three common interventions in an undergraduate, writing intensive agricultural leadership course. A second instrument collects self-reported data on students' perceptions of, and preferences for, the writing interventions and course structure. Study results have implications regarding: (a) which interventions and course structures should be adopted to maximize the effect of writing intensive courses in improving student success in the workplace, and, (b) linking specific interventions to lessening writing apprehension.

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Should Discussion Forums be Eliminated from Online Courses?

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The prevalence of online courses is increasing in the realm of higher education. Often within these courses, there is a discussion forum or some type of online gathering place to facilitate peer-to-peer interactions. Recently, there have been studies that question the usefulness of these forums and suggest that in designing online courses, they should not be included. This recommendation is based on survey findings of students preferred instructional strategies and their perceptions of discussion boards. The purpose of this study is to challenge the idea that discussion boards are unnecessary in online classes. We collected data from students' final reflection papers for an online diversity and social justice course for agriculture students. There were 163 essays collected every semester between Summer 2014 and Spring 2015 (6 semesters). In this final reflection paper, students were asked to discuss their learning and personal growth over the course of the semester. 109 of the students mentioned the course discussions as a part of their reflection, and most their comments were about how the discussions were impactful for their learning. Based on their comments, this is likely due to the nature of the course. These findings are important to consider for those designing and teaching online courses. In thinking through course designs, in addition to considering students preferred instructional strategies, the type of course and the course goals are also an important consideration.

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News, Democracy and You–
4-H e-Publication

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There is currently a lack of readily accessible e-publications focused on helping middle school and high school students develop basic professional communication skills. Innovative teaching approaches such as producing e-publications have the potential to help students learn basic skills, which is becoming progressively important due to the rapid technological advancement of society and demands of employers. This study was on the development of a 4-H e-publication that focused on the relationship between journalism as a form of communication and democracy as an institution. This e-publication aimed to develop basic and effective written communication skills and expose students to the power and importance of visual communication skills. It also serves as a reminder to 4-H volunteer adults and Extension professionals of the importance in focusing on developing these skills in youth. By developing this resource for the world of 4-H e-publications, students and adults have been given access to information that can help them improve their skills in personal and professional communication. Written communication skills take knowledge, time, and confidence to develop. E-publications such as the one developed in this study can help youth develop a basic understanding of the skillset needed to achieve this knowledge. The steps taken in the development of this e-publication and other ways youth participants can gain confidence and develop 21st century skills needed in the modern workplace will be discussed. The material will be piloted this summer at Purdue's 4-H youth programs. The success of the product may lead to interactive versions of the e-publication.

119

Using the ARCS Model to Develop an
Online Animal Science Course

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Many Colleges of Agriculture are seeking to offer more of their courses online to meet the needs of the growing population of students desiring an online learning experience, or to alleviate over-enrollment in introductory courses. This project applied the ARCS Model of Motivation to an online introductory animal sciences course that had exceeded maximum capacity for traditional teaching. The ARCS Model provides guidance for designing instruction to positively impact students' motivation to learn, through combining attention (A), relevance (R), confidence (C), and satisfaction (S) in the instructional design. The purpose of this model is to create a course that engages and motivates students to learn and retain the material for future use. The ARCS Model was applied to the lecture and lab sections and designed to highlight each of the four motivational components. Student's attention was captured through a thought-provoking question or video pertaining to that lecture's topic. Relevance of the material and knowledge was displayed to the students through industry examples, such as use of the information in a specific animal agriculture career. Students built confidence of the topic through interactive questions and activities and gained satisfaction in the form of appropriate positive feedback and the awarding of points in the course. The application of the ARCS Model within the context of an online agriculture course is a unique application and approach to teaching this material.

121

Incorporating Applied Research with Student Organization Funding

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Fund raising is a constant challenge for University Student Organizations (SO) especially in communities where resources are limited and the population is less than 30,000 people. An innovative remedy to this funding challenge is to incorporate the SO into research proposals. The purpose of this poster is to illustrate and share a research project that lent its self to a large labor requirement. To resolve organizing and hiring all the labor the PI hired the Natural Resource/Range Management Club of Southern Utah University. The members of the club then developed a bid and performed the work for the agreed upon bid. This project fostered an educational experience into a fund raiser for the club. Many of the members that participated in the project have developed an interest in conducting undergraduate and graduate research. The club has used the funding from this project to help defray expenses to attend professional society meeting. This has been a win, win project and the club now has a reputation of doing quality work and has been approached to complete some other projects.

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Helping Students Learn Both Course Content AND Best Learning Practices

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Transitioning from high school to college level learning is challenging for many students. Often lacking are sufficient self-regulation skills, especially those related to learning how to learn. In order to help students, develop and apply effective and appropriate learning strategies, we created and adapted a number of activities and assignments specifically designed to help students learn both course content AND best learning practices. Thus, the focus of this presentation is to share both the underlying pedagogy and overall effectiveness of these learning-how-to-learn activities and assignments as implemented in a large enrollment, introductory food science and human nutrition course, FSHN 101. Featured activities and assignments include: Just in Time Learning Tips and Strategies, In-class Microthemes, Online Section Quizzes, Learning Journals, and Exam Wrappers. The underlying learner-centered purpose of each activity and assignment was provided in the syllabus and discussed in detail with the students. All activities and assignments were based on one or more effective research-based strategy for enhancing student learning, including retrieval practice, spaced practice, interleaved practice, elaboration, generation, reflection, calibration, and mnemonic devices. Overall, our experience with implementing these learning-how-to-learn activities and assignments has been very positive and rewarding. In general, students reported an improved awareness and proactive mindset toward their study habits in FSHN 101, as well as in other courses, because of the intentional focus placed on the principles and practices of learning how to learn in FSHN 101.

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A Native-Pollinator Innovative STEM-Integrated Program

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There continues to be a growing interest in educational programs with science, technology, engineering, and mathematics integration, due to a need for more qualified STEM educated employees. This STEM-Integrated Native-Pollinator Program is looking to increase STEM literacy of 4th-6th grade students that attend an after-school

program at the local YMCA. The objectives of this program include: 1) measure STEM knowledge gained by youth in an after-school program, 2) measure youth's abilities to construct evidence-based reasoning and utilization of metacognitive practices in terms of applying knowledge, and 3) identify potential factors that influence volunteer educators' desire to teach the subject matter (pollination). This 20-week program will be taught by Master Gardeners (MG). The topic areas incorporate evidence-based reasoning and a design component. Some topics include: engineering design, bee family identification, soils, plant science, pollinators and flowers, pollinator garden design, and weather. Lessons are specific, with steps to each activity and materials needed. Each lesson builds upon the previous one, and is designed to help students' use evidence-based reasoning to make a claim. Data will be collected during the course of this program. One through MGs, and the second will be on the students participating. MGs were surveyed after their training to better understand their motivations for teaching the program. Students will fill out worksheets to see if they are learning scientific reasoning and if they can apply these topics to a real-world problem. This is a pilot study and this program will be implemented at many different locations in the future.

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Marketing Failures Help Students Realize Cooperative Learning Benefits

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Marketing a product, service, or idea to an inappropriate target audience is one of the reasons agricultural businesses experience product and brand failure. Indeed, identifying the appropriate target audience for agricultural marketing communications messages is an important skill. As such, many agricultural communications programs teach students how to perform an audience analysis; however, the curricula may only focus on identifying the appropriate audience characteristics for message development. Similarly, many of the marketing communications campaign examples found in text books focus primarily on the successful campaigns, rather than the unsuccessful ones. Microsoft founder Bill Gates once said, *"It's fine to celebrate success, but it is more important to heed the lessons of failure."* In that spirit, an innovative teaching exercise using product marketing failures was developed. The exercise combined cooperative learning strategies with marketing communications teaching strategies. Student groups were assigned "failed" products that were poorly marketed (e.g., McDonald's Arch Deluxe, WOW! Chips, New Coke). Students were placed in groups to conduct an audience analysis in conjunction with market research. Upon completion, the student groups presented their plan to reintroduce the product in a contemporary setting to the class. The goal of this exercise was not only to give students experience in conducting an audience analysis and market research, but to also help them improve their self-esteem, and develop interpersonal, critical thinking and presentation skills. Cooperative learning skills, and the ability to conduct research, are valuable skills needed in all agricultural disciplines, which makes this exercise flexible for any context.

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To Be the Best You Have to Beat the Best… Do You Also Have to Beat the Biggest?

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Thomas Lynn and Jacob Scott
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FFA chapters in Texas are divided into 10 geographical-based Areas, then divided into Districts. In Leadership Development Events (LDEs), the top two teams at District qualify for Area, and the top two teams at Area qualify for State. Areas vary significantly in membership, from 5,353 members in Area II, to 19,635 members in Area III. Schools from larger Areas compete against

more teams and larger chapters at the District level. Do these chapters then have a competitive advantage over smaller Areas at State? This study analyzed the influence of Area size (measured by membership) on the performance of schools at the State LDEs from 2013-2015. Reverse scoring (1st place=10 points; 10th place=1 point) converted placement to points. Quadratic regression with Area membership and its square were independent variables, and total points scored by schools from that Area was the dependent variable used to assess the influence of Area size on performance of schools in the State LDEs. The results of the regression analysis showed that membership and points scored had a quadratic relationship with the square term statistically significant (p<0.001). Area VI (12,029 members) scored the lowest total points (81) and Area III (19,635 members) scored the highest total points for the three years, yet the three smallest Areas (I, II, and IV) performed better than the three medium sized Areas (VI, IX, and X). Findings revealed that more competition increased LDE success for schools from very large Areas, but schools from the smallest Areas outperformed schools from medium-sized Areas.

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Innovative Learning, Research, and Service through a Creative Inquiry Summer Experience

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Varroa mites have been linked to the catastrophic loss of honey bees in the United States. To address this issue, an undergraduate research project coupled with service learning was initiated in an attempt to increase the population of varroa mite resistant honey bees in Tennessee. Numerous commercial pesticide and management methods for control of varroa mites have been investigated but a more desirable goal would be to locate, select for, and propagate honey bees that are locally adapted to the environment and genetically resistant to varroa mite infestation. An undergraduate student in the School of Agriculture sought a faculty mentor through a Creative Inquiry Summer Experience grant program at Tennessee Tech University to investigate this issue. The student and faculty mentor identified the following objectives for this project: 1) learn to propagate new resistant honey bee colonies from eggs produced by a genetically resistant queen, and 2) produce a documentary on colony management, queen rearing, and the significance of honey bees to agriculture production. Queens with potential to produce genetic resistance to varroa mite infestation were propagated and new colonies with this genetic potential were established at Tennessee Tech University. The number of colonies was increased from three to seven by the end of the summer. The documentary described honey bee biology, social behavior, colony management, and value as pollinators. It was made available through YouTube and has served as an educational tool to increase awareness among elementary and high school students in the middle Tennessee region.

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Using the Swivl Package to Foster Reflection in Pre-Service Teachers

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Learning to teach is challenging. New teachers are entering a profession driven by high stakes testing, standards-driven curriculum, often evaluated based on complex rubrics that may involve student outcomes. Research suggests the importance of pre-service teachers identifying inconsistencies between their perceptions of education and personal practices and actual expectations and that there is a difference in pre-service teachers' written and oral reflections and suggested that the interactive nature of the oral

interview prompted detail. Technology can be utilized to help create this outcome in young teachers. Swivl is a technology package that includes a mobile-device video capture application configurable to record and store on the mobile device or directly to the company's cloud. There is also a "robot" designed to hold a personal electronic device in a cradle connected by a cable. A marker device is worn that creates a connection to the base to track the presenter's movement. This technology is being piloted for pre-service teacher training. Students are asked to make personal introductory videos with primary function to interface with the technology and progressing to capturing and uploading videos of their cooperating teachers then that parallel evaluation of the recorded lesson. Three summative assessments provided understanding of effective instruction evaluation and reflective practice. An increase in evidence of evaluation and reflection was formatively observed by the instructor. There was a difference between the first (N=15, M=23.07 SD=6.89) and final (M=33.53 SD=4.10) lesson evaluations suggesting growth in written evaluation.

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Post-Secondary Student's Self-Assessment of College Level Readiness

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The purpose of the study was to determine college level readiness in students in the agriculture department at a regional university. The data collected was focused on the student's understanding of their own college level readiness originating from traditional secondary educational programs. In this qualitative study, the objective was to identify what areas in secondary education could be attributed to college readiness. The Tuckman

Model of educational systems was used as the foundation for developing the research questions. The research questions used focused on the classroom experiences students worked through in secondary education that may have benefited them in building the necessary skills that could be applied in post-secondary education and how did other organizations prepare them to be college ready? A survey was distributed students in an entry level university experience course that was populated with students from the department of agriculture. The students that were present (n=67), were asked to answer demographic, Likert-type, open-ended, and terminal questions built within the survey. Fifty-six (56.71%) percent of the students replied (SD 6.8) that the classroom setting encouraged them to explore post-secondary education yet forty-eight (43.28%) percent prepared them for post-secondary education. Ninety-one percent of the students (n=61) reported that they were involved in an organization in high school. Of those responses, the primary organizations included 4-H, FFA, athletics, music, and curriculum specific clubs. The results could be useful in assisting secondary teachers in curriculum planning, program planning, and course assessment to help students become college ready.

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Can a Lab Exercise Encourage Participation in Undergraduate Research?

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The objective of this study was to determine if a hands-on research-focused laboratory exercise in an animal anatomy and physiology course could improve student's critical thinking skills and stimulate participation in undergraduate research. A histopathology laboratory exercise was developed using thyroid tissue from day-old chicks that were part of a toxicological study on glucosinolates. Twenty-seven students were familiarized with the study, animal model, and the

effect of dietary glucosinolates on thyroid function. Students developed a hypothesis based on their knowledge of how glucosinolates affected thyroid function. Students measured thyroid follicular diameter using compound microscopes fitted with optical micrometers. Individual measurements were collected, and students were instructed on how to analyze the class data using analysis tools in Excel. Based on summary statistics and t-tests, students decided if chick embryos treated with glucosinolates impaired thyroid function compared to a control group. Students completed online homework questions related to thyroid anatomy and physiology, submitted a lab report, and completed a questionnaire to evaluate the effectiveness of the laboratory exercise. Seventy percent of students felt that they learned more about conducting research with animals. Ninety-six percent of students learned to use the microscope as a diagnostic tool, and 81% of students felt more confident in using the microscope. Only 16 students agreed that the exercise improved their understanding of research methodology and use of statistics. Three students (11%) expressed interest in participating in undergraduate research after finishing the research-focused lab exercise.

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PREP (Professors Reviewing Excellent Practices) – A Course for Faculty

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A 10-session, 15-hour professional development course regarding teaching and learning was launched in Spring, 2017. The target audience was new-to-teaching faculty in agriculture. Course topics served as a quick on-ramp regarding effective pedagogical practices as well as serve as an efficiency-aid for faculty new to teaching. While the course was not for credit, the structure was like for-credit experiences; participants experienced the learning management system (BlackBoard) as a student and experienced

varied teaching styles and assignment constructs. The packaging of content and class activities were designed to build a community and network of instructors. Topics addressed included learning styles, personal teaching philosophy, backward design and syllabus construction, managing cognitive load, learner-centered approaches, assessment approaches, assignments, motivating students, technology for inside and outside of the classroom, lab- and project-based learning, and assessing teaching. Instructor/planner lessons from the experience include the role of backward design for the course, adequate marketing and communication, modeling effective practices, scheduling, and motivating/recruiting. This presentation may be of value to teaching faculty and graduate students as it will contain the resources used in the course. It may be of value to those who wish to encourage and equip faculty for the teaching role by providing ideas and resources (readings, videos, assignments). Preliminary evaluation of the course which is currently underway will be provided.

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State FFA Leaders' Perceptions of Homeschoolers in Agricultural Education

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Homeschool students represent a rapidly expanding population of over two million individuals from which to potentially recruit Agricultural Education students, FFA members, and subsequently collegiate agriculture students. Expanding access to Agricultural Education and FFA membership for this community has been suggested in the past and is a focus of ongoing research. A key stakeholder in expanding the enrollment of secondary Agricultural Education and membership in FFA chapters are state-level FFA leaders (i.e., advisors, executive secretaries, program directors). State-level FFA leaders are policy gatekeepers of FFA participation and membership eligibility. Therefore, it is essential to

know the acceptability of current and potential program participation models to state-level FFA leaders. Homeschool students are currently provided with a clearly defined model for FFA membership eligibility and a complete Agricultural Education program experience in two states (Alaska and North Carolina). However, these two states do not exhibit the only models of program participation. This study analyzed perceptions and attitudes of all U.S. state FFA leaders with regards to providing homeschool students with an Agricultural Education program participation model and FFA membership eligibility. A quantitative census utilizing electronic survey methods collected data from 47 of 50 states (42 responses, 5 partial). State-level FFA leaders agreed the most acceptable model of Agricultural Education program participation and FFA membership for homeschool students was part-time public-school enrollment for coursework, membership in the school FFA chapter, and SAE completion directly supervised by the local teacher. Potential and observed models will be discussed along with policy and research implications.

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A Case Study on Reflection During Preservice Teacher Immersion Block

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Teacher preparation programs enable preservice teachers to develop quality teaching practices by providing a variety of experiences to develop skills such as self-reflection and being an adaptive expert. Through authentic clinical practices, preservice teachers engage in pedagogical growth while refining their content-specific pedagogy. The purpose of this study was to describe the relationship between student teachers' reflective processes and their perceptions of preparation for the immersions during professional block coursework. A case study approach was used. The study was founded on Kolb's Experiential Learning Cycle (ELC). Preservice teacher artifacts such as reflection journals and lesson plans, were the sources of data. Data were segmented based on immersion activities to describe preservice teachers' reflective practices and preparedness to teach. Preliminary findings suggest that preservice teachers transferred pedagogical ideas from immersion to immersion which supports the expectations espoused by the ELC. Presentation of study would entail a description of A Modern Philosophy of Immersion for Teacher Preparation and the implications of research for preparing teachers in preservice programs.

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The Impact of Facebook on Undergraduate Learners Self-Efficacy

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Research has shown that social support, including support developed via social media platforms such as Facebook, is an important determinant in students' successful transition to college life. Studies are now exploring the use of social media as pedagogical tools to enhance student engagement and learning. This study examines undergraduate students' self-efficacy in the context of a reflective learning process after guest speaker engagements in class. Students (n=36) self-selected into groups, where one group utilized Facebook as a reflective platform and the other group used the University's electronic learning management (ELM) system as a reflective platform. In addition to measuring academic self-efficacy using a Likert Scale (1-Not at all true to 5-Very true; Cronbach's Alpha=0.862), Facebook self-efficacy (Cronbach's Alpha=0.942), usage and attitudinal questions were also assessed. Descriptive results indicated that self-efficacy for the Facebook group was slightly higher (M=4.1, SD=0.44) than the University ELM group (M=4.03, SD=0.53). Facebook self-efficacy was

also higher for the Facebook group (*M*=4.7, *SD*=0.36) than for the University ELM group (*M*=3.91, *SD*=1.01). Additionally, students in the Facebook group scored higher (*M*=13.9/15 possible points) on reflection assignments than students in the University ELM group (M=12.9/15 possible points). Results suggest that allowing students to utilize social media platforms to enhance learning in a reflective context may contribute to an overall increased in self-efficacy. This study also suggests the use of social media tools as a way to reflect on guest speakers may engage students in learning while enhancing undergraduates' university experiences.

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Evaluating Measurements of Leadership for Peer Mentors and Leaders

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A comprehensive literature review was performed to identify instruments in peer reviewed articles that measure leadership in college students. The researchers examined electronically accessible questionnaires, scales, and survey instruments (N=72), in addition to associated background literature. Selected instruments (n=28) were evaluated for their psychometric rigor and general utility for use in the context of a college student peer mentoring or peer leadership program evaluation. Employers in agriculture and the related sciences have reported that college graduates are generally lacking in certain areas of soft skill development, including leadership. Peer-led programming has been utilized to positively impact leadership development in undergraduate students. Such programs can benefit from periodic evaluations to inform data-driven decisions related to program design, implementation, funding, and continuation or termination. Peer Mentor program administrators benefit from using existing instruments in their program evaluations.

These instruments are generally theoretically sound, well tested, and require less time input than developing a novel instrument for a program evaluation.

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Relationship between Engaging in Socio-Cultural Discussions and Major

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Engaging in socio-cultural discussions has been positively linked to cognitive, behavioral, leadership, and social change-related outcomes in college students. Socio-cultural conversations occur when peers engage in discussions of values, backgrounds, experiences, and perspectives through cross-cultural interactions in student organizations, peer groups, and classes. Previous studies have found that engagement in socio-cultural conversations were the single strongest positive predictor of socially responsible leadership. For minority students, socio-cultural conversations help create a sense of belonging to overcome discrimination. In a national profile of college students, students of agriculture were less likely to be engaging in socio-cultural conversations than their non-agricultural peers, which was a significant predictor of leadership capacity. A student's primary major will influence their coursework, peer group, and faculty interactions while at the university. In addition, the major and departmental culture has a significant impact on student success, learning, persistence, and satisfaction. To explore the potential relationship between major field of study and student engagement in socio-cultural discussions, a secondary analysis was performed on campus data from the Multi-Institutional Study of Leadership (MSL). The MSL is an international study of college student leadership that has engaged upward of 300,000 students at over 250 universities since 2006. Data from simple, random samples of students at a large, Midwestern university in 2010,

2012, and 2015 were analyzed. Exploring major field of study and socio-cultural discussions may point to major programs that are successfully incorporating social issues in the classroom or encouraging dialogue across difference to promote student development.

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A Content Analysis of Climate Change Education in Colleges of Agriculture in the Big Ten Schools

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Within higher education, the 'big ten' conference schools are hallmarks of collegiate education. Spread across the east and the heartland, they represent the diverse nature of universities, not only in athletic prowess but also in undergraduate education. Therefore, it is appropriate to look to these schools for the latest research and teaching on the topics that are important to society. One such topic is climate change. As temperatures increase, precipitation becomes more varied, and storms become more intense, the agriculture sector will be adversely affected. This study examined the current status and offerings of courses related to climate change in the colleges of agriculture. Using content analysis as a method of study we reviewed courses at the undergraduate level among big ten universities (N=10; 4 universities were excluded because of absence of colleges of agriculture). We used key words searches of 'climate change' and 'global warming,' along with word variations of 'climate and 'global. Findings show that most agricultural colleges in the big ten lack a strong representation of undergraduate courses that contain titles related to 'climate change.' General trends amongst the colleges indicate that there is a stronger representation of climate change education in the natural sciences such as forestry, soils, biology,

etc. over agricultural social sciences such as agricultural economics, education and sociology. Need exists to develop new courses or revise existing courses to include climate change in the undergraduate curricula. Big ten colleges of agriculture should come together to collaborate on course development and or offerings via distance.

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Student Perspectives after Watching Documentaries in a Contemporary Animal Issues Course

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Marketing food products has a major impact on agriculture; thus, by including topics in coursework, students are exposed to current marketing strategies, practices, and consumer-buying habits of agriculture food products and educators can illustrate the benefits and downsides to these strategies. In a contemporary animal issues (fall 2016) course at Sam Houston State University, twenty-four graduate students completed pre- and post-surveys polling their ideals on various marketing strategies. After a pre-survey, the class viewed a documentary that highlighted negative aspects of agricultural marketing practices. Students' responses were recorded individually, divided by gender, and analyzed using the paired TTEST procedure in SAS. Females (n=17) tended to agree that it was wrong to feed animals feedstuffs that are not appropriate for their gastrointestinal tract (P<0.08) than their original perceptions prior to viewing the documentary, with males (n=7) having a more noticeable and statistically relevant shift (P<0.02) regarding the same topic. In the pre-survey, 16% of students stated the producer is liable for obesity and health effects of consuming junk food yet none of the students blamed the producers in the post-survey. Males also tended to believe that there should be

a luxury tax placed on food that does not meet government standards of a healthy diet (P<0.08) in their post-survey responses. Although the students tended to be swayed in their opinion by these documentaries that are slanted with their information, this exposure can also give students a perspective and understanding of social issues that impact the animal agriculture industry.

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ABE Graduate Student Recruitment: A Formal Affair?

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In 2013, the Department of Agricultural & Biological Engineering (ABE) at Purdue implemented a formal event to recruit top domestic applicants to our program. In years prior, ABE brought applicants to campus on an individual basis based on their availability. Implementation of a formal event enabled the prospective students to sample the topics and quality of research within our department. Initial success of the poster session from our recruiting event encouraged our Graduate Student Association to organize an Industrial Research Symposium, first held in 2014, to coincide with the recruiting event. The symposium provides an opportunity for our graduate students to gain leadership experience, moderate sessions, and present their research through poster/oral presentations. Incorporating a well-organized research symposium into the recruiting event excites our recruits and conveys the breadth of research in our department in a single event. Each year we bring between 9 and 14 prospective students and pair them with a current graduate student to host them in their homes for Thursday and Friday evenings. The students attend the poster session and a formal dinner on Thursday. Friday begins with presentations from the graduate school, meetings with faculty, and campus/lab tours. The event concludes with dinner and a social with the graduate students on Friday night. The feedback from the prospective students is al ways very positive – in an exit survey we receive

ratings of satisfied or very satisfied for almost every event – and we generally have about 80% acceptance rate on offers made to our applicants.

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Gender Differences on Environmental Issues after a Contemporary Animal Issues Course

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Animal agriculture has a major impact on the environment; thus, including topics in coursework that promotes sustainable practices, educators can introduce topics and subject matter that promote the mutualistic relationship of animal agriculture and the environment. Twenty-four graduate students enrolled in a contemporary animal issues course in the fall of 2016 completed pre- and post-surveys polling their ideals on ethics and animal topics. After the pre-survey, the class viewed a documentary and engaged in class discussion. Students' responses were recorded individually, divided by gender, and then analyzed using the paired TTEST procedure in SAS. Gender differences were noted on several animal and environment issues. There was no statistical difference in the opinions of female students (n=17) pre-vs post regarding animal agriculture and its adverse effects on the environment (P>0.01), nor the level of concern of the earth's water supply (P>0.01). Different than their male counterparts, females maintained their ideals regarding the consumption of less animal products to ensure environmental health pre-and post (P>0.01). Male students (n=7); however, changed their belief and indicated they should consume less animal products to ensure environmental health (P<0.01). All males indicated no concern of animals having adverse effects to the environment, 85% supported consuming less animal products. With this shift in opinion, it shows that even agricultural students exposed to this type of documentaries are more likely to soften their original viewpoints.

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Student Perspectives of Environmental Issues after a Course in Contemporary Animal Issues

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Some social groups deem animal agriculture has having a negative impact on the environment and have published many documentaries supporting their view. Thus, in a contemporary issues class at Sam Houston State University these topics are immersed in coursework so students can examine both sides of the issue and develop a societal perspective of animal agriculture and associated issues. In an open forum discussion of these animal related issues, students can support or alter their original viewpoints. Twenty-four graduate students enrolled in the course in the fall of 2016 completed pre-and post-surveys polling their ideas on ethical and environmental topics associated with animal agriculture. After the pre-survey, the class viewed a documentary and engaged in class discussion. Students' responses were recorded individually, divided by gender, and then analyzed using the paired TTEST procedure in SAS. Students were more likely to believe that animal agriculture adversely affects the environment in the post=survey ($P<0.01$) than their original perceptions prior to course discussions. The level of concern of the earth's water supplies decreased from pre- to post-survey ($P<0.01$); yet, students were more likely to believe that they should consume less animal products to ensure environmental health ($P<0.01$) and tended to agree with food disparagement laws ($P<0.01$) in their post-survey analyses. With this shift in opinion, it shows that even agricultural students exposed to this type of documentaries are even likely to change or alter their original viewpoints and belief.

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Student Perspectives Regarding Human Health after a Contemporary Animal Issues Course

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With the impact that animal agriculture has on human health and health issues, educators at Sam Houston State University introduced new teaching methods and aids to develop awareness of issues associated with animal agriculture and human dietary choices. Twenty-four graduate students enrolled in a contemporary animal issues course in the fall of 2016 completed pre- and post-surveys polling their ideas on health as it is associated with animal products. After a pre-survey, the class viewed a documentary with anti-animal production agendas. Students' responses were recorded individually, divided by gender, and then analyzed using the paired TTEST procedure in SAS. Students tended to believe that a primarily meat-based diet is bad for their health ($P<0.08$) than their original perceptions prior to viewing the documentary, with males ($n=7$) being more likely to believe that consuming meat can contribute to cancer ($P<0.07$) than females ($n=17$) ($P<0.7$). Students also tended to agree that a plant-based diet is a scientifically valid diet in their post-survey responses ($P<0.08$). Likewise, students were more likely to believe that their social class affected their food choices as healthy vs unhealthy ($P<0.08$) in their post responses. With this shift in opinion after viewing an anti-animal documentary, it shows that people exposed to these topics are likely to become swayed in their opinions due to the documentaries viewpoint based the dangers that are potentially imposed on human health via animal agriculture.

NACTA Abstracts

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Teaching Others to Lead: The Mock Nominating Committee Program

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Leadership training is necessary. Research has shown an increase in leadership capabilities when individuals can analyze, discuss, and practice leadership skills. The Mock Nominating Committee (MNC) program was created to provide leadership training to potential state officer candidates by reinforcing key leadership competencies and skills. Previously, state officer candidates were provided no formal training to prepare them to run for office and had little or no knowledge of the process. The MNC is a two-step leadership training program, whereby state officer candidates complete a series of six online leadership development modules before attending a one-day workshop. The MNC provides the opportunity for potential state officer candidates to develop and recognize their individual leadership competencies as well as provide candidates with an overall view of the formal three-day slating process at state convention. Additionally, the MNC fostered a service learning opportunity for the University of Arkansas undergraduate leadership students including the development of leadership training modules, workshop facilitation, and the cultivation of mentoring relationships with MNC participants. Participants receive weekly feedback on assessments from the University of Arkansas student mentors. Positive program feedback was received from the career and technical education state staff, the Arkansas FFA Executive Secretary, agricultural education teachers, and officer candidates. MNC mentors self-reported benefitting from the experience as they could further develop personal leadership insights and teaching techniques. Future plans include continuing to further develop the MNC program by incorporating other youth leadership development programs such as 4-H, FBLA, DECA, FCCLA, and FTLA.

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Job Satisfaction and Self-Efficacy of Mid-Career Agricultural Educators

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Teacher retention is a major, ongoing issue in the United States. Forty-one percent of all educators will leave the teaching profession within five years. The field of agricultural education is of particular concern, as there currently is a national shortage of highly qualified teachers. The purpose of this descriptive quantitative study was to examine factors related to job satisfaction and teacher self-efficacy of mid-career Agricultural Educators attending the NAAE XLR8 program (n=20). Specific objectives of the study were to 1) identify demographic information of the sample population, 2) determine levels of job satisfaction and self-efficacy of the participants, and 3) compare and contrast job satisfaction and self-efficacy findings based on demographic characteristics. Using a theoretical framework grounded in Herzberg, Mausner, and Synderman's Motivator-Hygiene Theory and Bandura's Self-Efficacy Theory, a survey instrument was developed and administered to gather demographic data as well as determine levels of job satisfaction and self-efficacy of the participants. The demographic data were used to categorize potential leavers (those that have looked for a job outside of teaching) and the stayers (those that have not). Overall the participants had a high level of self-efficacy while overall job satisfaction was also positive. Results also determined there was no significant difference in the levels of self-efficacy and overall job satisfaction among the potential leavers and stayers, but there was a statistically significant correlation between the two groups in specific areas of job satisfaction related to level of recognition they receive and their school policies and issues with administration.

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Using Reflexive Journaling in Skills-Based Classes

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Measuring student learning within skills-based classes tends to rely on projects and tangible outcomes to determine the students' success in the class. While those methods have proven to be successful, this research explored how to encourage students to reflect and internalize the skills taught in a digital design class to critically apply those skills into their future careers. Using a reflexive journaling process, students in a class focused on learning Adobe InDesign and digital design practices journaled weekly. The students were given the entries at the end of class, with 10 minutes to begin reflecting and asked to finish before the next class. Within the entry, students included their work produced in the class and reflected upon their strengths, weaknesses, aspirations, and future goals with the software and content. Sometimes the entries required the students to find design work that inspired them and reflect on how to recreate that work using their learned skills and identifying skills they would need to learn to accomplish that task. It was found when the students were given a specific place and time to reflect on how the skills learned in the classroom would be integrated into their future career, they were able to identify their strengths and weaknesses within their own skillsets. In turn, they asked questions during the next class for clarification of the skills they learned during the previous class, further application, and/or more advanced skills because they saw the value and application to reach their aspirations of the future.

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Integrating Co-Construction Methods into Course Curricula

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The field of higher education continues to evolve and create new methods of instruction to engage students with the content to encourage critical thinking and flexible adaptation of skills. One of those methods is co-construction, wherein students are asked to engage in discussions in which they apply knowledge and skills learned in the classroom into the context of their own lives. The purpose of this study was to understand how the integration of co-construction methods of instruction within two courses of a major impacted the level of knowledge and engagement among the students for their critical understanding and application of learned knowledge into their future careers. Utilizing focus groups with the students and in-depth interviews with the instructors, the impact of implementing co-construction practices was measured from both the learner and facilitator. Focus group themes revealed a deeper understanding and application of the material presented in each class by the students. Themes within the interviews revealed a unique way of developing courses, centered on building in opportunities for reflection and flexible learning opportunities within the courses. The findings suggest that implementing co-construction practices into classes requires the students to be actively engaged in the course content to form meaningful connections between the class and future workplace. Instructors of co-constructed classes must be flexible with their lesson plans and be comfortable serving as moderators of discussion at times between students. Overall, both students and instructors found a deeper way of thinking of the course content beyond the walls of the classroom.

connect/develop/achieve

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Creating Community Agriculture Awareness through an Advocacy Service Learning Project

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Today less than 2% of US labor force is directly involved in agriculture compared to the 1940s of more than 40% involved. There is a multiple generation disconnect from the farm due to urbanization and industrialization. This separation has greatly affected agriculture literacy and awareness. Today's youth and even adults are often unaware of food origin. "Breakfast on the Farm" is a service learning project conducted by students enrolled in a beef cattle course. Teams created hands-on interactive agricultural learning stations to engage participants of all ages, especially children. Both students and participants completed a pre- and post-survey about the event. Students agreed that participating in the service learning project: 1) improved understanding of course material (85.7%), 2) improved oral and presentation skills (81%), and 3) was a worthwhile contribution to the community (95.2%). Community participants agreed (100%) that the event improved their understanding of agriculture. Agriculture is important to our continuously growing population and the event filled a need to provide agricultural awareness to the community. "Breakfast on the Farm" enhanced student learning by going beyond the classroom and back to the farm.

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Assessing Change in Student Understanding of a Career Field

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We introduced an agricultural sales class in 2000 using the Purdue model. While, over time, course content and pedagogical methods have evolved, the course continues to include the two major projects outlined in the initial course design. These individual student projects involve a day riding with a sales professional in the student's field of interest and an exercise where students sell to sales professionals who role play customers. Both projects cumulate with a paper wherein students describe and evaluate the sales process in terms of course content. During the past three years, assessment of student understanding of the agricultural sales profession has involved comparing student responses to questions from the first day of class to those provided during the final week of class. Those questions are: 1) Describe to me a typical day in the life of a salesperson, first identifying what you are selling and the level of customer you will be calling on; 2) What are other things you must do on a fairly regular basis? and 3) What are other things do you do at least annually? Comparing individual student responses pre- and post-course has helped us assess changes in student perception of the profession. Student perceptions changed most in how time is allocated, the level of detailed planning and administrative work required to manage a sales territory, and the need for explicit consideration to work-life balance given the unique seasonal requirements of the profession.

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Framework for Successful Academic Advising

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This literature review analyzes the role of academic advising- its definition, application and benefit to undergraduate university students. A framework for success was developed from the literature with five reoccurring indicators highlighted to identify the qualities of a productive advising meeting with students. Those discovered indicators were trust, communication, utilizing resources, guidance, and empowerment. It was recognized that the application of each of the above indicators added to the success of the undergraduate student and the validation of the academic advisor. In addition to the background on academic advising gained from the literature review, spring 2016 College of Agricultural Sciences senior exit interview data in the Environmental Resource Management program at Penn State was examined to determine the level of satisfaction graduating students had with their advisor's availability to meet, knowledge of degree requirements, and internship/career opportunities. Seventeen graduating student responses were received with an average ranging from 4.47 to 4.76 out of 5 across questions. The highest satisfaction was the advisor's knowledge of degree requirements (4.76) and the lowest the knowledge of internship and career opportunities (4.47). The discovered indicators found in the literature, along with data acquired through senior exit interviews were used to determine best practices for successfully advising students academically. Observations from the literature and the results of the exit interviews are intended to inform best practices for both professional and faculty academic advisors.

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Correlation Between Attendance and Grade in Introductory and Junior Level Classes

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Learning outcomes are achieved when two-way interaction exists between the student and the instructor. Although there are different modes to interact with the instructor, attendance is a critical factor that can affect learning outcomes and student grades. The goal of this study was to determine the correlation between attendance record and grade during different weeks of a semester in an introductory food science class and an upper level applied nutrition class. Data were collected during the Fall 2015 and Spring 2016 semesters from the students enrolled in Fundamentals of Food Science (FDSC 1133; freshmen level; 202 students) and Applied Animal Nutrition (ANSI 3563; junior level; 215 students) classes. Attendance was collected using a web-based interactive tool TopHat®. A simple correlation was used to determine the relationship between attendance and exam scores. The results indicated that there is a positive correlation between attendance and exam grade. There were differences in correlation coefficients between courses and between Spring and Fall semesters (FDSC 1133: Spring=0.44; Fall=0.65 and ANSI 3563: Spring=0.57; Fall 0.71). Further, there were differences in correlation between different exams and weeks of the semester. Although there might be various reasons for missing classes, the current analysis indicates that missing classes can affect student performance. Hence, determining the reasons for missing classes will help to design strategies to improve student engagement and grade. We believe that implementing interventions to improve student attendance will help to improve student performance and retention.

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Using a Photo Booth as a Means of Exposing Youth to Ag Careers

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A recent report by the USDA's National Institute of Food and Agriculture indicate that there will be an annual shortage of approximately 22,500 qualified candidates to fill the 57,900 open positions in the agricultural field between 2015 and 2020. Due to the high demand for graduates with some fundamental agricultural knowledge, there has been a recent push to expand agricultural education and literacy efforts within our urban and suburban communities to help meet this ongoing workforce need. As part of an initiative to educate urban youth about various careers in the agricultural industry, the University of Illinois Extension Service's Ag in the Classroom program in Rock Island County created an agricultural career photo booth to utilize at various summer camps, career days, back-to-school events, and educational workshops to expose these students and their parents to agricultural careers. At these various events, the participants got to pick out the agricultural career of their choice (out of the list of thirty-six) and get their picture taken using the available costumes and props. The photos were developed using an instant camera and distributed to the children within several minutes. When the youth took these photos home, they could scan a QR Code on the frame that would take them to the National FFA Organization's AgExplorer website where they could further explore these careers. To date, over 2,000 elementary and middle school aged students have participated in this activity and have been exposed to various agricultural career opportunities available to them.

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From Poaching to Oil Spills: A Hybrid Approach to Teaching Forensics

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A transdisciplinary course in forensics was developed in Fall 2015 to introduce graduate and advanced undergraduate students to theoretical and applied approaches in the science of wildlife and environmental forensics. This poster will present the assessment results of that course. In the course, a hybrid instructional approach was used whereby a third of the lectures were delivered online, a third of the lectures were delivered in person, and a third of the class periods were set aside for team problem-solving activities and projects. Online closed-captioned lectures were broken into 10 minute segments and separated by individual short assessments using Blackboard. In class lectures were led by faculty and external experts across disciplines, providing a collaborative teaching experience for the faculty, and opportunity for students to engage with subject matter experts. Over two semesters, anonymous pre- and post-assessments using a Likert scale were administered to assess students' perception of the hybrid approach, their learning experience and achievement, and recommendations for course improvement. Students overwhelmingly preferred the hybrid delivery of this course to traditional online or in person formats. Students reported that the group projects and assignments helped them to connect with their classmates, which was important given the more limited in-class contact the students had with each other. Students also indicated that they felt confident in their abilities with respect to the course objectives.

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College Students' Self-Perceptions of Communication Skills

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College students possess varying levels of communication skills for use in real-world situations. Although students are expected to possess proper communication skills; this is not always the case. To meet students' needs, some universities have put in place communication/ writing intensive courses. This study's purpose was to understand students' perceptions of their communication skills prior to and toward the end of their collegiate experience. Using a five-point scale (1=low, 5=high), students assessed their communication skills in a retrospective pre- and post-test (before and after taking communication/writing-intensive courses). Communication skill areas assessed included: listening effectively (pre: M=3.91, SD=0.93; post: M=4.39, SD=0.73); communicating accurately and concisely (pre: M=3.60, SD=0.95; post: M=4.21, SD=0.76); communicating orally (pre: M=3.53, SD=1.01; post: M=4.17, SD=0.77); communicating pleasantly and professionally (pre: M=3.54, SD=1.04; post: M=4.26, SD=0.73); communicating in writing (pre: M=3.58, SD=1.05; post: M=4.27, SD=0.80); asking effective questions (pre: M=3.35, SD=0.97; post: M=4.11, SD=0.82); and communicating appropriately and professionally using social media (pre: M=3.53, SD=1.19; post: M=4.26; SD=0.88). Students (n = 168) perceived their communication skills improved from before the courses to after; however, males reported this improvement to be significantly less than females. Strongest motivators for students to pursue better communication skills included an enhanced life experience, increased employability, and a well-rounded résumé. As educators strive to provide quality educational experiences, understanding students' perceptions is important. Results indicate communication/writing intensive courses may be improving students' communication skills; however, experimental studies are needed that document if perceptions of improved skills equate to actual improved skills.

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Simulations and Interactive Tools for Agricultural Science Education

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Interactive, discovery-based computer simulations and virtual labs provide a low-risk opportunity for learners to engage in interactive learning, including lab activities. Through a variety of digital modules, the ScienceofAgriculture.org website presents food, agricultural and environmental science content in fresh, contextually relevant ways. Multimodal learning tools allow students and teachers to actively engage in inquiry and discovery – both foundational elements in science. These modules use examples specific to food and agriculture sciences and address math and data concepts (unit conversion, logarithms, interpreting plotted data), soil processes (sorption and water movement), and concepts for chemistry (pH, valence, bonding, and water activity). Interactive virtual labs address procedures involved in specific lab activities and prompt exploration of key scientific concepts, such as molecular level interactions of chemicals with soil and water – concepts more easily visualized with computer animations than printed two-dimensional figures. Aimed at undergraduate students, the resources are also appropriate for consumers, extension agents, high schoolers, and others. Funded by multiple sources (USDA-NIFA Hispanic Serving Institution program 2014-38422-22089, 2010-38422-21211; USDA-NIFA Higher Education Challenge Grants 2008-38411-19055, 2011-38411-30625; USDA-NIFA 2014-38640-22175 through Western SARE, project number EW15-011; and university-based funding), the educational tools are not designed to replace traditional

instruction or lab practical's, but to supplement instruction on challenging or particularly time-consuming concepts. Stakeholders, including general education faculty, agricultural sciences faculty, alumni and employers informed choices regarding content that students struggle to understand, processes that demand excessive lecture time to convey, and areas in which graduates are underprepared for the workforce.

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Benefits and Challenges of School and Community Garden Projects in South Carolina

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Throughout the United States, children have been fed larger portion sizes with increased fats and carbohydrates, while healthy food intake has decreased. South Carolina has been faced with increased obesity rates and how to combat this problem to improve nutritional education and decrease childhood obesity. Research on school and community garden projects has shown to promote healthy lifestyles by incorporating nutrition education and hands-on curricula to provide opportunities for active engagement and positive decision making. The purpose of this study was to analyze benefits and challenges involved with school and community garden programs through a qualitative, case study approach. The study was conducted within two high schools and one elementary school. Program leaders were emailed an interview protocol prior to a scheduled site visit to assist with efficiency of time during the in-person interview. The three schools were in different stages of development of their projects, but it was evident certain aspects provided support for the project to flourish, while others caused challenges for production and sustainability. We recommend project leaders outline focused goals and objectives that are closely aligned with the

curricula, funding, support, and resources available prior to constructing a school and community garden project. Many resources are available to assist with starting school and community garden projects focused on nutritional education that may potentially combat childhood obesity by improving adolescents' ability to make healthy dietary choices. Grant funding should be pursued. We determined community support as a vital component to assure sustainability of the project.

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Student Reflections of Gender Leadership

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The 2016 presidential election highlighted the increasing number of women in prominent leadership positions, as Hillary Clinton was the first female nominated as the presidential candidate for the Democratic Party. During the past decade, women have emerged as prominent political leaders in countries such as the UK, Germany, Brazil, and South Korea. Moreover, 27 women currently serve as CEOs of the S&P 500 including companies such as General Motors, Staples, Lockheed Martin, Campbell's Soup, and Hewlett-Packard. Despite women in political and organization leadership, there is still a shortage of women deans of agriculture among land-grant institutions. Students in an undergraduate leadership theory course at the University of Arkansas examined this phenomenon by analyzing the personal leadership journey, including the education and experiences, of a female dean of agriculture. Students utilized Kolb's Experiential Learning Cycle to explore the Leadership Labyrinth model. Specific aspects of the Leadership Labyrinth model analyzed include human capital (education, work experience, home/work conflict), gender differences (style and effectiveness; commitment and motivation; self-promotion; negotiation; and traits), and prejudice (gender stereotypes, biased perceptions, vulnerability, and cross-pressures). When referencing the dean's experiences

and education in comparison to the leadership model, three themes emerged from student reflections: a) female deans are treated differently (both positively and negatively) than male counterparts, b) home/work conflict is prevalent, and c) work expectations remain the same regardless of gender. Student participants recommended using guest speakers to illustrate and test other leadership theories and models such as path-goal theory, adaptive leadership, and the psychodynamic approach.

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Developing a Mentoring Based Recruitment and Retention Program Model

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Mentorship plays a significant role in attracting and retaining underrepresented minorities (URMs) in science, technology, engineering, and mathematics (STEM) disciplines. The Mentoring@Purdue Program (M@P) aims to increase the number of women and URMs pursuing and completing post-secondary STEM-based agricultural and life science degrees (AgLS). The M@P program established several mutually beneficial partnerships between an 1862 land grant research one institution and six 1890 historically black land-grant colleges and universities. The M@P program has two components. The on-campus component provides monthly seminars and workshops to foster a sense of community and help faculty and graduate students develop knowledge and skills to use mentoring as a strategy to overcome and navigate barriers that URMs face in higher education. The off-campus component, the Summer Scholars Program (SSP) provides students with a scholarship to visit Purdue University's campus for a 3-day real-world immersion experience which includes interactive workshops and culturally relevant activities. A major driver of the SSP is the focus on STEM-based

AgLS disciplines that is complimented by providing students with instrumental and psychosocial mentoring experiences. The SSP has hosted 35 URMs from historical black colleges and universities during the past three years with the number of participants increasing each year. Findings from program evaluations of the SSP have indicated that participants' self-efficacy to apply to graduate school increased by over 90% and confidence to apply to a research-intensive university increased by 60%. The goal of this poster presentation is to describe the program's rationale, accomplishments, future initiatives, and outcomes/impact.

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Enhancing the Agriculture, Community, and Natural Resources Program through Experiential Learning

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A lot of research has proven the value of experiential learning for undergraduate students within the agriculture and life sciences field. The focus of experiential learning is to enhance the student's classroom knowledge through practical and real-world experiences. The purpose of this presentation is to highlight how different experiential learning methods have enhanced our Agriculture, Community, and Natural Resources (ACNR) Program here at the American Samoa Community College. Ten years ago, our program was in a dismal state, with no full-time instructors and little to no student interest in agriculture with low graduate and retention rates. With local and federal support, and experiential learning programs, we now have 64 graduates (since 2006), 3 full-time instructors, and over 130 students currently majoring in our program. Experiential learning programs include local and off-island internships, ACNR Summer Institute, and Annual

Spring Break Trips to Independent Samoa. Twenty-four students successfully completed research projects through local and off-island internships. Fourteen students also successfully completed practical learning experiences in various U.S. insular areas and Independent Samoa. Our ACNR Summer Institute provided hands on learning experiences for 260 high school students and incoming ACNR majors. Twenty-five students also had the opportunity to observe development and researches in agriculture and natural resources in Samoa during the past spring breaks. Since the introduction of experiential learning programs, there has been an increase in student interest, enrollments, graduates, and students presenting in formal settings (such as classrooms, symposiums, and national conferences).

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Legal Frameworks and Women Farmers' Land Ownership by the Sukuma of Tanzania

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Land tenure is one of the most important issues in agriculture. Women farmers in Tanzania have constitutional rights to own, buy, sell and use land, guaranteed by the National Land Policy and statutory laws. The objective of this presentation is to share findings on current legal and customary laws, regulations, and practices that have an impact on women farmers' access to and control over land in the Sukuma tribe in Tanzania. The tribe studied is a patriarchal system where mostly men control resources. Findings from the study show that there is a contradiction between statutory laws and customary laws. Statutory laws clearly allow Tanzanian women rights to own land. Customary laws restrict and even deny

rights of women farmers' land ownership giving land ownership and management responsibilities to men. Women farmers lack knowledge of national laws and are at the mercy of men and local customs. In addition, women farmers know little about their basic human rights under constitution and national laws. Inability to know their human rights, deprive them from legal access of resources such as land. The researchers recommend ensuring the Sukuma community has access to education about human rights and violence against women. Tanzania has 132 different tribes and many clans within tribes. The key to addressing this situation lies in education for men and women throughout the country. Non-formal education is recommended for village-level awareness of national laws and in human rights to help women learn about their right to own and manage agricultural land.

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Assessment of Academic Achievement of Students in a Pre-Veterinary Cohort

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In 2014, a course was created that established a cohort of pre-veterinary students and grouped together these students as they moved through their degree plan and allowed them to complete courses with one another. To determine if this course was effective in helping students with their future studies, two other courses, a freshmen level animal science course and a junior level animal nutrition course, were used to assess academic performance. Overall GPA, course grades, and number of times the two courses were repeated were recorded for each student and used to determine if differences existed between the students in the cohort and pre-veterinary students who were not part of the cohort. For all values measured, no differences were detected ($P>0.10$) between the students in the cohort when compared to those outside the cohort. This illustrates that being in the cohort did not improve

GPA or grades in the indicator courses. While not significant, in both indicator courses, the number of repeats was numerically lower for students in the cohort compared to the non-cohort students (P=0.19 and 0.29, respectively). This lack of significance may be due to the low number of repeats in general, but may suggest that even though grades did not differ, the cohort reduced the number of times a student needed to repeat a course. In summary, this program is still in its infancy and more data needs to be collected before it can be determined if it is a worthwhile venture.

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Facilitating Student Success in Gateway Courses with Animated Tools

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"Raising the Gates" was a project to help fill gaps in student understanding of key concepts in agriculture classrooms: processes that students struggle to understand, topics that demand excessive lecture time to convey, or areas in which graduates are underprepared for the workforce. In service of this goal, we created original, multimedia teaching materials (16), including animations, videos and interactive tools. These resources are aimed at undergraduate students but are also appropriate for consumers, extension agents, and younger students and are freely available online at ScienceOfAgriculture.org. The website presents content in fresh, contextually relevant ways, allowing learners to apply their own knowledge to specific problems. Funded by multiple sources (USDA Hispanic Serving Institution program 2014-38422-22089, 2010-38422-21211 and university-based funding), the team first identified knowledge gaps through focus group interviews with general education and agricultural science faculty (4), employers (4), and students/alumni (4). Identified topics included: relevance of chemistry and math to students' own

majors/careers/life; ionic state, charge density, intermolecular forces, bonding, and reactions; the role of proportions/fractions in fertilizer applications, animal feed recipes, and dosing; the difference between ions, compounds, and molecules; "functional groups" or sites of reactions; and the complexity of soil systems, including the roles of ions, elements, and organics. We then built a variety of digital modules to address this content – as well as short "career" videos. Student input informed character design, product features, and level of the materials. The modules use examples specific to agricultural sciences and address math/data concepts, soil processes, and concepts for chemistry.

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Augmented Reality as a Learning Tool for Horse Judging Education

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Learners in horse judging experiences have limited educational exposure to live animal's due to cost, time, availability, and liability surrounding practice. Current technology models use stagnant images of the animal in a series of photos allowing areas of gap and distortion, in addition to unrealistic side-by-side comparisons of the animals. To increase the participant exposure to authentic practice, while reducing liability and cost, increasing the contextual authenticity of the technological tool becomes necessary. Using augmented reality, by overlaying graphic images on real life materials, the learner gains the opportunity to combine virtual and real life learning environments, thus expanding learners' spatial relationships to real life contexts. This is achieved through an application based cognitive device used in combination with a smart technology and round marker based system, that when combined provides a virtual representation of a horse in 360-degree view. To test authenticity of practice, as well as if increased cognition is taking place,

professional equine judges are part of a front-end analysis to determine if a virtual model can support the necessary acquisition of skills. The initial application of the treatment will determine 1) what are the cognitive skills involved in judging an animal; 2) does the virtual model provide inquiry process comparable to real life; 3) is
virtual reality the ideal tool to reduce liability and cost while increasing cognitive ability? This tool addresses the need for integration of new technologies to better serve the educational needs of the equine industry.

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Interactive Activities in a Plant Breeding Course

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Plant breeding can be a difficult subject for many undergraduate students because many of the topics requiring students to understand complex mathematical, genetic, biological, and statistical theories and operations. Traditionally the undergraduate plant breeding course taught in the Department of Soil and Crop Sciences at Texas A&M University has relied heavily upon in-class lectures. It was a style that likely suited people classified as auditory learners by the VAK/VARK model developed by Neil Fleming. However, it probably has not been the most effective approach for most students who would fall into the kinesthetic learning style classification. A new approach was taken in 2017 that incorporated interactive activities into a third of all class meetings. These in-class activities were conducted within the constraints of a conventional lecture hall. They included role playing, simulation of biological events using modeling, and 'Kahoot!' quizzes. Students were surveyed at the end of the course to gauge their perceived effectiveness of the hands-on activities. Peer-to-peer interaction, test scores, and frequency of ad-hoc study groups have all improved over previous years.

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Student Research Abroad – Sustainable Agriculture in Cuba

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Cuba is a nation in the midst of vast economic and social changes. The way in which they are currently ensuring food security is a mix of modern and traditional approaches. These dynamics offer students a unique learning platform to study and asses in situ an agriculture system in flux. In collaboration with faculty from Auburn University, and the Organization for Tropical Studies, which is headquartered in Costa Rica; a two-week field trip occurred in which students and faculty stayed at the University of Matanzas, an agriculture university about 30 miles outside of Havana, Cuba. While there, students toured local farms, agriculture businesses and had interactive activities that focused on topics such as environmental quality protection, use of biological pest control, silvo-pastoral forage systems, extension, agricultural marketing, organic food production, and turf grass production and care. The students' assignments for the experience included writing a reflective paper as well as a research paper on various topics directly related to Cuban agriculture. For the research paper, students were expected to integrate personal interviews and observations along with data and information openly available in published literature. These efforts will be the basis of launching a full-study abroad program in 2018 aimed at preparing students for international service in countries with transitioning agricultural systems.

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Study Abroad in Mexico

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Mexico is one of the most important countries in terms of contributions to global food security. Its rich history of Meso-American civilizations, Spanish colonialism, and a 20th Century revolution in which food security played an essential role provides a powerful backdrop for students learning the important and complex linkages of agriculture and civilization. Moreover, the opportunity to visit CIMMYT helps students understand the beginnings of the Green Revolution and their continued commitment to fight global hunger and poverty. A study abroad program in Mexico has been taught since 2007 through the Department of Soil and Crop Sciences at Texas A&M University. During this time, students who have taken the course improved their grade point ratios after the course, were more likely to complete graduation and more likely to seek post-graduate degrees than non-participating cohorts. In addition, 63% of the students in the course eventually requested at least one letter of recommendation from the professor leading the course. This suggests the program improves the students' focus on education, inspires them to seek higher degrees, and creates mentor/mentee relationships which can be critical for success especially for minority and first-generation students.

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Tale of Two Courses: Embedding Research in an Undergraduate Curriculum

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Authentic research experiences embedded within specific undergraduate courses and programs have been proven to produce significant gains in communication, quantitative reasoning, scientific literacy and critical thinking skills. Additionally, students report enhanced self-confidence, adaptability and problem solving-skills due, in part, to the deeper and more meaningful faculty-student interactions from course-embedded research activities. Given these benefits the integration of undergraduate research was the focus of a recent curricular review and revision in our chemistry and environmental science programs. Although the introduction of research skills—from analyzing primary literature to interpreting data and communicating results— was carefully scaffolded through-out the program, strategic courses were chosen to include complete research projects. In the first year, mid-level courses in analytical chemistry and conservation biology successfully embedded undergraduate research projects to address multiple student learning outcomes. Although the approach was different in each course, similar gains in intellectual and personal skills were observed. Assessment of student laboratory notebooks and final poster presentations using AAC&U VALUE rubrics found that over 70% of students achieved an overall score of 3.0 or above on each of the five dimensions for written communication and critical thinking. Additionally, over 65% of students achieved an overall score of 3.0 or better on each of the six dimensions for inquiry and analysis. Overall student evaluations noted increase confidence in their ability to engage in research activities. Our findings suggest that two different ways of creating authentic course-embedded research experiences produce significant gains in student learning.

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Teaching as a Graduate Student: A One-credit Teaching Module Case

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College teaching skills play an important role in the academic job market. Teaching-focused positions represent a growth area in faculty hiring. Teaching Assistantships (TAs) help prepare graduate students in teaching but are not traditionally offered in colleges of agriculture. To

bridge the gap, a one-credit graduate-student-led teaching module was developed in spring 2014 in the Department of Agricultural Economics at the University of Kentucky. This teaching model provides a more manageable level of responsibility for graduate students in their first time as primary instructors. It also addresses certain employer-desired soft skills for undergraduate students. Since inception, 9 graduate students have taught 179 undergraduate students in 17 one-credit sessions under 9 different course topics. Our research objective is to evaluate outcomes of this unique teaching model based on undergraduate evaluations as well as graduate student and faculty perceptions. Data were collected in three formats: 1) 15 course evaluations; 2) surveys of 35 graduate students and 18 faculty; and 3) semi-structured interviews with 10 graduate-student instructors. On evaluations, graduate-student instructors obtained 3.10 out of 4 on the overall value of the course and 3.39 out of 4 on the overall quality of teaching. Both scores are not significantly different from the department and university means. Survey analysis demonstrated boosted confidence in teaching abilities and communication skills, clearer career goals, better job preparation among instructors after the one-credit teaching experience. Student management and course design are most challenging aspects in teaching the one-credit. Faculty also indicated perceived value of the one-credit teaching model.

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Impact of Photo Narratives on Reflection and Learning Retention

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Cultural heritage describes our "way of life." It comes from previous generation's traditions and incorporates our current constructed and natural environments, and tangible artifacts. PhotoVoice is a social action research process by which people identify, represent and enhance their community through specific photographic techniques. The photo narrative process, derived from PhotoVoice, combines photography and narrative expression about artifacts important to one's way of life. One desired outcome of photo narratives is to help learners reflect on their personal cultural heritage through personal photographs and narratives of artifacts central to one's way of life. This study explored the impact of photo narratives on students' reflections about their cultural heritage in agriculture. Researchers analyzed graphic and textual content of photo narrative reflections created by students participating in two agricultural study abroad programs. Content analysis revealed prominent cultural heritage themes were agricultural lifestyle, familial appreciation and outdoor living. Participants' reflections centered on agricultural production (familial or commercial) in Texas as most symbolic of their cultural heritage. Their reflections helped them better understand the importance of host country nationals' cultural heritage involving agriculture, family and outdoor activities in two distinctly different study abroad programs. Photo narrative assignments have evaluative and instructional value across agricultural disciplines, enabling learners' ownership of subject matter. The combination of image and text empowers learners and deepens information retention through expressive communication and reflection. Educators should incorporate discussions about agriculture, family and outdoor lifestyles into other topics to promote understanding of cultural heritage across agricultural disciplines.

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Zoom into Professional Development

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Video conferencing technology offers a solution to engaging students in professional development during internship experiences. Instructors in agricultural education implemented Zoom© video

conference technology as part of a required seminar course during a twelve-week student teaching internship experience in a school-based agricultural education program. The seminar course is designed to provide professional development throughout the internship. Student teachers typically return to campus on three separate occasions during the internship. However, internship locations scattered across the state, along with inclement weather, prevented attendance for some group members. We utilized Zoom© to connect with participants remotely so they could be active participants, capture valuable content, and connect with other cohort members. Video conferencing technology was also utilized for a webinar on creating resumes and cover letters. Using Zoom© allowed us to interact with the students at a distance, share content, and answer questions. The class meetings were recorded and shared with those that were not able to virtually attend synchronously. A key benefit to offering professional development at-a-distance is the ability to maintain the sense of learning community felt by the cohort of students, even when they cannot physically be present. According to one participant, *"It felt like I was there in the class with them! In all honesty, it felt like it did when I was in the seat next to my 9 other cohort members!!"* The free Zoom© application allowed vital information to be presented at no cost, allowing us to connect with students throughout their internship experience.

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Using Reflection to Understand Knowledge Gained in a Media Writing Course

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Reflection as long been documented as a way for students in a writing course to learn and evaluate themselves as writers. Drawing on this idea, we used a qualitative analysis of student reflections to identify what knowledge students gained about themselves as writers in a writing-intensive course. To fulfill the study's purpose, 37 students in an advanced agricultural media writing course described their knowledge gained in the course and provided two examples that illustrated their knowledge. Some students used the course to develop advanced writing skills and gain an understanding of advanced writing concepts. For example, one student noted she gained *"the capacity as a writer to tell a story and, more importantly, tell a person's story."* Another student noted *"confiden[ce] in my ability to relay my message to my readers with a sad and honest tone"* was a key takeaway from the advanced writing course. Yet, several of the students noted they gained basic agricultural journalism knowledge, such as AP Style, punctuation, and editing. Such knowledge is important, but students in an advanced course should gain in-depth knowledge related to writing and storytelling. Although the advanced course is designed and delivered to provide students an understanding of advanced journalism concepts (e.g., storytelling), students may not seek advanced skills. Therefore, introductory editing and writing courses should emphasize the importance of understanding basic journalism concepts and better prepare students to learn advanced journalism concepts. Additionally, more research needs to be done on effectively preparing students for advanced agricultural media writing courses.

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Using Natural Science Models to Improve Social Science Learning

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We wanted to know if and how natural science models could be used effectively to teach students about social science concepts. We developed an after-school program for minority secondary school students (n=10) that aimed to teach them how to form more sustainable com-

munities and develop more effective personal career plans. To teach these social science skills, we first taught participants how to build and manipulate a related natural science model, namely a sustainable aquaponics system. Our hypothesis was that students could use their knowledge of how an aquaponics system works sustainably to identify effective strategies to improve their local communities and personal career plans. Using a pre-test / post-test methodology, we show that students demonstrated statistically significant gains in both knowledge and comprehension of all three natural and social science concepts. In a retrospective analysis, we found similar results. Student participants reported statistically significant gains in all aquaponics system concepts (5/5), all personal career planning concepts (3/3), and nearly all community structure concepts (5/6).

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Lab or No Lab: The Use of Experiential Learning in an Introductory Animal Science Course

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Experiential learning has become a steadfast teaching method in many middle and high school classrooms across the United States; however, many college classrooms continue to utilize teacher-centered instructional approaches. The Animal and Dairy Science Department at a Land-Grant University decided to remove laboratory components of an Introduction to Animal Science course. Therefore, researchers examined the effect of experiential learning on students' retention and comprehension of course content. Students were separated randomly into three groups and given either a control or experimental treatment utilizing a counterbalanced experimental research design. The control treatment was a review session each week that consisted of students generating questions about the content. The experimental treatment was the incorporation of experiential learning opportunities during

the weekly review session. Researchers meet weekly to develop experiential learning opportunities for students receiving the experimental treatment. Sample experiential learning opportunities were: dissection of reproductive tracts, dissection of digestive tracts, ultrasounds for pregnancy and genetic predictors, and conducting artificial inseminations. Group one received the control treatment throughout the entire class, while groups two (units one and two) and three (units three and four) received the experimental treatment for two of the four units in the course, on opposite unit's groups were provided the control treatment. Data suggests the usage of experiential learning opportunities increased the student comprehension and retention of knowledge on course exams. Therefore, the researchers suggest the utilization of experiential learning opportunities could enhance students' ability to retain, recall, and transfer knowledge to additional experiences.

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Teaching and Learning: An Investigation of Student-Centered Approaches to Student Learning

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Effective teaching reflects professional decisions made before, during, and after interactions with students, which when implemented, increases the probability of student success. In an effort to demonstrate effective teaching, faculty in the College of Agricultural Sciences and Natural Resources have implemented a variety of online tools, teaching strategies, and resources for students enrolled in introductory Agriculture, Food and Natural Resources (AFNR) courses. This study was designed to gather student feedback on the effectiveness of various teaching behaviors, course tools and course delivery methods in enhancing student learning. Ninety-eight students in intro-level horticulture and soil science

courses voluntarily participated in a survey that used a 42-question instrument which covers various course delivery methods, usage of course tools, teaching behaviors or strategies, as well as demographic information. Survey results reveal that online discussion boards, recorded lectures and the use of social media platforms worked well for most students. Class projects, group presentations, writing assignments, quizzes and hands-on activities were also viewed as course activities that enhance learning. On the other hand, students generally responded unfavorably to flipped class delivery, the use of clickers and the use of class humor. No significant difference in student response due to class level, gender and respective college of origin were observed. This information will serve as basis in efforts to design or modify classes to enhance student learning.

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Minority Experiences in Agricultural STEM Fields: A Framework and Review of Literature

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Recruiting talent from a diverse pool of potential agricultural professionals is essential to increasing variation in thought and accelerating the emergence of creative solutions to STEM challenges in agriculture. However, people from minority groups are not pursuing careers in agricultural STEM fields despite a growing number of accessible opportunities. Part of the reason for that is related to how people form their identities and how individuals from minority groups perceive the "otherness" expressed as an outcome of their interactions with majority groups and culture. The development of identity and the understanding of self are two facets of life that are constructed based upon shifting self-representations that meld together professional, social, and collective identifies and promote an "illusion of wholeness." For persons within minority groups, the illusion of wholeness involves not only the

melding of professional and social identities, but it also often involves the development of identities that govern behavior and perception among both minority and majority groups. A person's self-conceptions tend to form based upon the internalization of how others see and treat them. This study employed review of related literature and a symbolic interactionism framework to describe what is known about the identify development of people from minority groups in agricultural STEM fields. The findings present strategies to better recruit, train, and retain persons from minority groups within agricultural STEM careers and agricultural organizations.

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Using Focused Atmosphere Seminars for Career and Leadership Readiness of Women in Agriculture

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This study created a focused atmosphere, designed for female undergraduate students to increase preparedness and confidence with career decisions in Agribusiness. Though women in STEM (Science, Technology, Engineering and Mathematics) careers are becoming more common; limitations in traditional industries remain. The USDA (United States Department of Agriculture) finds 31% of farmers are women within the state of Missouri. This number indicates production agriculture only, which is less than two percent of agribusiness. A Women in Agriculture Career and Leadership Seminar was hosted by the Department of Agriculture for female Agribusiness and Agricultural Education majors. A pre- and post-questionnaire was administered to participants (n=14) with students self-identifying on a Likert-type scale of Strongly Agree to Strongly Disagree in areas of: self-knowledge, professionalism, networking and career skills. Data indicated improvement from within the focused atmosphere of the Career and Leadership Seminar

with post questionnaire results of Strongly Agree to the following statements: 75% of students identified, *"I am confident in my ability to convey my skills and knowledge to a potential employer."* Similarly, 75% indicated to, *"I believe I will be promoted within the agricultural industry based upon my qualifications and work ethic."* Comparatively only, 50% responded, *"I am confident with my professional networking ability;"* while, 100% of respondents believed they will have a successful career in the agricultural industry. This study shows promising results for continued research on focused atmosphere preparation for improving confidence within undergraduate female students entering the traditional industry of Agriculture.

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Factors Impacting Mindset in Youth Involved in the Indiana 4-H Animal Science Projects

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Mindset is how people view their abilities either as growth, their actions can improve that ability; or fixed, that the ability is finite, and cannot be changed. One thing that influences youth mindset is interactions with adults. The purpose of this research is to determine if there is a relationship among 4-H animal science project participants in youth's mindset type, the type of feedback received from 4-H educators and adult volunteers, and the amount of feedback received. Data were collected from 255 students, attending schools that were selected for participation using a striated random sampling technique. Data was entered into SPSS, and fixed mindset questions were recoded to align scales for fixed and growth mindset items. The preliminary analysis shows that participants report characteristics of fixed and growth mindsets, and there is variation of mindset within the population. Regarding feedback, participants indicated they received definitely received, or received quite a bit of feedback

from parents or relatives (44%), club leader or volunteer (36%), fair judge (33%), peers (26%), and the Extension Educator (24%). Verbal feedback was received by 44% of the youth and written feedback was received by 26% of participating youth. Fifty-five percent (55%) of youth reported the feedback they received was useful. Further analysis will determine if there is a correlation between mindset and feedback.

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Career Decision Self-Efficacy in Postsecondary Agriculture Students

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The mission of the College of Agricultural and Life Sciences (CALS) at the University of Idaho is to provide students with practical education that prepares them for careers in a growing job market. Between 2015 and 2020, there are projected 57,900 annual job opens in the areas of food, agriculture, renewable and natural resources. Only about 50 percent of the occupations are estimated be filled. This descriptive-relational study was designed to describe the relationship between CALS students' high school and collegiate involvement to their career decision self-efficacy (CDSE). CDSE is defined as an individual's ability to complete tasks to make career decisions. Career decision for CALS students is based on Lent, Brown, and Hackett's social cognitive theory of career development and Mitchell and Krumboltz's social learning theory of career decision making. CALS juniors and seniors (N=521) responded to an instrument, which included the short form of the Career Decision Self-Efficacy Short Form scale (CDSE-SF) and collected background information on high school involvements, collegiate involvements, and demographics. Overall, CALS students demonstrated moderate to high confidence across all five constructs (self-appraisal, occupational information, goal selection, planning for the future, and problem solving) of the CDSE-SF scale. These results provide information to

help faculty and staff stimulate career oriented experiences designed to motivate students to fill vital food, agriculture, and natural resources positions across the nation and world.

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Integrating Spatial Educational Experiences into Soil Science Education

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The goal of the Integrating Spatial Educational Experiences (Isee) project is to teach students how and why soils vary at different scales and why it matters. The project utilizes data from the USDA SSURGO soil survey dataset, digital elevation models from the National Elevation Data Set, roads and streets from OpenSteetMap, and data from other sources to prepare informative maps designed specifically for teaching and learning. Dominant Soil Parent Materials, Natural Soil Drainage Classes, and Soil Orders maps are available for Indiana, Illinois, Kentucky, Ohio, Texas, West Virginia, and Wisconsin. Some states, such as Indiana, have additional maps of Surface Soil Colors, Acid Subsoils, Limiting Layers, and even a historic map from 1852. All maps are available via a free iPad app (https://appsto.re/us/nbdy7.i) or the new SoilExplorer.net website. Students explore soil landscapes by zooming and panning different maps, while popups provide additional information about each map unit. In the introductory Soil Science course at Purdue, the website is used to introduce key concepts related to soil spatial variability. In the upper level Soils and Landscapes course, students use iPads throughout the semester to learn how concepts discussed in the lecture correspond to the features they see on the maps. Then, during field labs, they learn how the features on the maps correspond to the real features they see in the field. This teaching-with-maps approach allows students to develop a deep understanding of the spatial aspects of soils that would be impossible to obtain any other way.

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Course Structure Impacts Grade Distribution: Traditional vs. Online

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Compared to the traditional classroom, online education is recognized for greater flexibility and convenience, and equivalent student learning outcomes; however, nuances of student success in online education remain underexplored. Objectives of this study were to compare grade distribution of traditional and online delivery systems and to evaluate factors contributing to student success in an introductory genetics class. Comparisons were made for three semesters (Fall 2014, 2015, and 2016), with each semester including two traditional sections (n≈250) and one online section (n=21-35). Grading was based on four multiple-choice exams (all semesters), bonus participation points (all semesters), and several types of independent and in-class projects (~30% of point total, 2014 and 2016). Although course structure differed from year to year, course structure of traditional and online sections corresponded within a semester. For the traditional sections, an asymmetrical distribution (right-skewed, mode of B) was observed in 2014 and 2016. Distribution in 2015 was bimodal, with consistently lower exam averages but the highest proportion of A letter grades. These results highlight the role of non-exam grading components in student comprehension and letter-grade outcome. Grade distribution for online sections was generally like the traditional sections for the respective year. However, aspects of the distribution were intensified in the online sections, including a greater bimodal separation in 2015. Although these features may be an artifact of sample size, the data suggest an interaction of course structure with the self-motivation and independence required for student success, and the importance of these factors in online education.

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Can Sunn Hemp be Used for Experiential Teaching?

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Teachers are always looking for new teaching methods for life sciences. Using sunn hemp (*Crotalaria juncea*) (SH+), a tropical leguminous cover crop, could be a method to meet this need. The objective of this study was to determine if instructors could use SH+ as an important method for teaching life science. Experiments were conducted on the Kauai Community College (KCC) campus in the field in Spring 2013 and Summer 2015. Shade house experiments were also conducted at KCC in Summer and Fall 2013, and at the National Tropical Botanical Garden in Fall 2015. Two high school outreaches were conducted at Kauai High School (KHS) in Fall 2014 and Fall 2016. Field and shade house experiments were to investigate the optimum interval of days between SH+ cover cropping and cash cropping, and determine the effects of SH+ on beneficial nematode, Rhabditidae. In all the experiments, sunn hemp not mixed with soil (SH-) was used as a control. The student learning outcome (SLO) for high school students was to observe nematodes, count nematode numbers and compare the results. SH+ reduced seed germination when seeds are seeded immediately after mixing SH+ and soil. SH+ did not reduce germination when seeds are seeded at one-week after mixing SH+ and soil. Students of KHS found consistently higher number of Rhabditidae in SH+ in 2014 and concluded that SH+ increases Rhabditidae number in soil. Students in the outreach in 2016 did not see any significance in number of Rhabditidae, however, methodology differences could be the determining factor.

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Student Perceived Benefits from Short Term Study Abroad

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Short term study abroad trips have become increasingly popular at Universities within the United States. The optimal study abroad trip length is subjective to institutional needs. Current agricultural students are facing a tremendous challenge upon graduating college to compete within a global work force. Many large agricultural industries are now invested in international operations, in order to better compete for these types of jobs students must immerse themselves within diversity and be prepared to compete within these markets. The purpose of this study was to explore perceived benefits students participating in short term study abroad trips held. To guide the study the following objectives were developed (a) identify the experiences and skills learned on the study abroad trips (b) identify barriers of short term study abroad trip. Data was analyzed utilizing a collective case study approach. Themes emerged within the first objective, experiences and skills gained by students. Theme 1: Students gained a deep cultural awareness. Theme 2: Lasting professional experiences were created. Additionally, themes emerged regarding the second objective, barriers to short term study abroad. Theme 3: Students would not have attend if required to learn the host country's language. Theme 4: Students are opposed to longer study abroad trips. Theme 5: Trip cost was ideal. Theme 6: Students alcohol management became an issue. Universities should seek further understanding, concerning the skills gained by students and the barriers they face, to further develop the success of their student's engagement abroad.

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Grocery Shopping for Geophytes

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Production of food crops, fiber materials, pharmaceuticals, and ornamental plants in societies has relied on plant propagation practices for tens-of-thousands of years. One propagation concept is asexual propagation of geophytes, specialized structures, in which several species are very important to the horticulture industry. An activity was implemented in the Plant Propagation course with two goals: to increase students' abilities to identify asexually propagated species, specifically in a grocery store setting and increase awareness and understanding of the importance of geophytic species involved in both food consumption and for ornamental production. A survey instrument was administered before the geophyte unit to evaluate the students' current geophyte understanding and their context in a local grocery store. Based on a Likert Scale (1=Strongly Disagree; 5=Strongly Agree), results indicated that 25% of the respondents (n=40) agreed or strongly agreed (ratings of 4 and 5) that they could define geophyte. When asked if geophytes are an important part of our food supply or the ornamental horticulture industry, 43.9% and 78.1%, respectively, agreed or strongly agreed with the statement. When asked to consider their geophyte familiarity in the grocery store (n=38), (1=Not at all aware; 5=Extremely Aware), 71% indicated that they were not at all to only slightly aware (ratings of 1 and 2) grocery store geophytes. Students were assigned to visit a grocery store identify and record as many geophytic structures or species as possible. A post-activity survey will be administered to determine the effectiveness of the activity in learning geophytes.

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An Undergraduate Research and Mentorship Program in the Natural Resource Sciences

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Mentorship is a common factor among undergraduate research experiences (URE). In most cases, undergraduate researchers are mentored by faculty members, yet graduate students may also serve as mentors. Unfortunately, many graduate students are never trained as mentors and must learn through trial and error, which can potentially lead to less impactful or enjoyable experiences by their protégés. Sul Ross State University's Borderlands Research Institute offers a unique URE program utilizing a mentorship hierarchy by which graduate students are given full responsibility of mentoring undergraduate researchers under the guidance of faculty members. As part of the program, graduate students are trained in mentoring with the aim of providing a quality URE and contributing to the professional development of graduate students. One essential component of effective mentoring has been the ability of mentors to build relationships with protégés. Thus, this study sought to examine Natural Resource Management students' perceptions of mentor/mentee rapport with their URE graduate student mentors. The sample consisted of all undergraduate students (N=16) participating in the Borderlands Research Institute URE during 2015 and 2016. A modified version of the professor/student rapport scale was used to measure participants' perceptions of rapport on a 5 point, Likert-type scale. Results showed the summated mean score for the rapport construct was 4.69/5.00, indicating a high level of rapport between undergraduate researchers and their mentors. The majority of participants agreed or strongly agreed that their mentors were approachable, friendly, respectful, reliable, and

encouraged participants' success. What is more, 100% of participants reported that they were satisfied or very satisfied with their URE.

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Bridging the Gap between College Algebra and Agronomic Math

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Practitioners of agronomy are often faced with scenarios involving math during their daily activities. Students studying agronomy are required to take college algebra but often miss the opportunity to bridge the gap between general algebra and math in an agronomic context. The purpose of this research was to evaluate the effectiveness of two delivery methods for teaching agronomic math. Videos and posters were created to demonstrate: fertilizer and pesticide application, unit conversions, irrigation, yield estimation, and growing degree day calculation. We predict using videos to teach agronomic math will be more effective by providing both auditory and visual teaching methods, while posters only provide visual elements. The videos allow students to control when, where, and the pace at which they learn. To assess the effectiveness of the videos and posters, four sections of Agronomy 212 Lab: Field Application and Problem Solving in Crop Production, were divided into two groups considering academic major and class meeting time in order to reduce bias. Both groups were given a pre-quiz and survey prior to starting the agronomic math unit. During the unit, students in each group completed a handout corresponding to either the videos or posters. Students were also provided with an additional set of practice problems to complete outside of class. The following week, a graded quiz and anonymous survey were given. Data were analyzed to determine which delivery method was more enjoyable and more effective at helping students learn.

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Personal Time Off: Incorporating the Workplace into the Classroom

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Preparing students for careers in agriculture is a top priority for agricultural educators. As such, simulating the agricultural workplace environments students will someday occupy, and the policies they will someday follow, can take agricultural career preparation to the next level. Personal Time Off (PTO) is a workplace policy offered by many agricultural organizations, providing employees with a pool of paid hours to use at their own discretion for illness, vacation, or personal time. Implementing a PTO structure in agricultural courses is an innovative teaching strategy that can reduce students' inclination to skip class by giving them the autonomy and flexibility to miss class when life necessitates. Providing this sanctioned time away from class facilitates self-directed learning, resulting in greater student motivation, independence, self-discipline, and self-confidence. To implement this strategy, instructors determine the number of hours to give students for PTO, and design a process for managing classroom attendance. Google Forms serves as useful tool for students to use to request time off in advance of their absence, as well as a means for instructors to approve time off requests. Students who do not submit for PTO prior to a class absence are subject to negative consequences, such as making up missed hours, additional coursework, or a lower grade. Similarly, students who do not use their PTO may be rewarded with extra credit, or other positive benefits. Instructors who have implemented the PTO process have observed a greater demonstration of course learning objectives, improved student attendance, and increased classroom productivity.

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Teachers' Perceptions toward Sustainable Agriculture in an Ohio Science High School

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The discussion of environmental challenges and its connection to conventional agricultural systems in the United States, has highlighted education as a barrier. Advocates of sustainable agriculture indicate that education can present solutions. The purpose of this study was to describe perceptions, definitions, and teaching methods of high school teachers in a global impact STEM academy high school toward teaching sustainable agriculture. A census (n=17) were presented with a Likert-type questionnaire. This portion of the study replicated research at Iowa State. Reliability ranged from 0.74-0.95. Teachers agreed on definitions of sustainable agricultural and practices. Teacher perceptions regarding sustainable agriculture primarily regarded food safety, soil testing, water quality, crop rotation and use of animal manure. Teachers taught topics about biological, social, and ecological dimensions of sustainable agriculture. Teachers engaged moderately about sustainable agriculture in their classes and used group discussion, hands-on-learning, projects, and websites for teaching sustainable agriculture. A focus group interview was conducted with nine teachers at the Academy. The code book was reviewed by experts to establish trustworthiness. Researcher bias was controlled through question, facilitator/moderator selection. Preliminary findings include teachers defining agriculture as "focuses on producing", sustainability as "maintaining, and sustainable agriculture as "producing through practices which maintained resources". Teachers shared that they engaged in project-based, and problem-based learning, and that these were implemented on a grand scale across the school through semester-long projects.

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Service-Learning: Getting Digital with Agricultural History

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Engaging our students with the Bart Garrison Agricultural Museum of South Carolina (BGAMSC) offers a plethora of learning opportunities, including service-learning. The late Senator John Glenn best summarized service-learning*: "By its very definition, civic responsibility means taking a healthy role in the life of one's community, state, and nation. That means that classroom lessons should be complemented by work outside the classroom. Service-learning does just that, tying community service to academic lessons."* Students in a Leadership of Volunteers class experienced the difference between volunteerism and service-learning through activities with the BGAMSC. In cooperation with museum staff, students were engaged in a service-learning project to develop marketing tools: digital videos and a brochure. In contrast, students studied volunteer management through volunteer activities with the museum, from assistance with museum events to preparation of raised bed gardens. The objective of this poster is to: 1) Discuss benefits of integrating a museum into course curricula; and 2) Identify perceptions of students participating in museum-based service-learning and volunteerism. Beyond the service-learning and volunteer activities, the museum provides an invaluable teaching platform. Using the museum's model, students were required to assess and reflect on volunteerism concepts, such as risk management, marketing, and volunteer recognition. Michele Holley reflected *"Before taking this class, I never knew the extent to which volunteers can make a positive*

impact in the community." Lessons learned from the volunteerism class as well as plans for future collaboration with the museum incorporating a web design class will be shared.

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Middle School Students' Food and Garden Experiences and their Engagement and Motivation

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School gardens and garden-based learning activities can be used to enhance students' indirect academic outcomes, specifically, students' intrinsic motivation to learn, engagement via classroom participation, and school engagement by making students' educational experiences meaningful through the contextualization of their course content. The purpose of this study was to explore and describe the relationships among middle school students' food and garden experiences and their school engagement, future educational aspirations, activity motivation, and activity engagement. A survey was administered to middle school students (N=120) enrolled in a course that offered a garden-based learning component at their schools. Results indicated that as students' participation in food and garden activities increased, students reported being more engaged in classroom activities, more motivated to participate in those activities, and more engaged in school; possibly because by engaging in school would allow students to reach their future educational goals and aspirations. To maximize students' school engagement and academic outcomes, teachers and school garden coordinators must take advantage of students' food and garden activity motivation and activity engagement by strategically using food and garden activities to contextualize academic content.

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Pre-service Teacher Preparation to Teach Record Keeping Techniques

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Record keeping has been shown to be beneficial in many situations and disciplines. Teachers who choose to include record keeping skill development in their curriculum can positively influence their learners. Agriscience Education has seen an increased usage of the online record keeping system for student's projects called the Agricultural Experience Tracker (AET), but it is unknown if new agriscience teachers are prepared to utilize the AET in their classrooms. The purpose of this study was to describe perceptions of preservice teachers in Agriscience Education toward A Modern Philosophy of Immersion for Teacher Preparation. The objective guiding this study focused on describing perceptions of preservice teachers toward preparation to implement AET during student teaching. This study utilized qualitative content analysis on transcripts of a structured focus group of the population (n=10 preservice teachers) to identify themes related to research objectives. The population was completing student teaching. The focus group debriefs were transcribed by a third party to ensure trustworthiness of results. Participants indicated that their required experiential learning course prepared them with a basic level of knowledge for using AET. The preservice teachers also asserted that they would like to learn more about teaching record keeping, and specifically, AET. They demonstrated positive feelings toward AET after implementation during student teaching leading to a willingness to continue implementation. Implications of this research could be used in further studies to prepare pre-service teachers to teach record keeping skills.

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Students of Color and Cooperative Learning Teams

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A strong research and policy discourse has emerged in recent years around how STEM learning systems might be reoriented to foster the emergence of researchers and professionals who can lead and work seamlessly within diverse teams. Helping college of agriculture students understand how to analyze social contexts and cooperate well with others will help them to attain the social and intellectual capital they will need in order to navigate the workplace environment and be successful in their professional roles. However, orienting programming to build those skills is complex and even discussions about it face many practical and conceptual hurdles. In conceptualizing, how to structure learning pathways for building capacity for teamwork, it is important to consider the individual personhood of all students; where they come from, how they see themselves, what they are pursuing and why is critical. Each person brings into a context their own unique structure of intersectionalities based on their lived experiences. Those experiences are shaped by how others view them and respond to their actions. The purpose of this phenomenological study was to describe the essential structure of the lived experience of students of color in heterogeneous cooperative learning teams. In-depth interviews were conducted with six females and three male students participating in a large course of study employing cooperative learning teams. Four major themes emerged: agency; commitment; interpretation; and reconciling. Recommendations include explicitly teaching all students about cooperation as a process and employing strategies for building appreciation for difference and the perspectives of others.

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The 1917-2017 History of The Ohio State University Department of Agricultural Communication, Education, and Leadership

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On July 1, 2017, the Department of Agricultural Communication, Education, and Leadership (ACEL) at The Ohio State University will celebrate its 100th anniversary. The Smith-Hughes Act provided the funding needed to educate more individuals to teach agriculture in public schools. Consequently, the Department of Agricultural Education was established at The Ohio State University. The purpose of this study is to publish the 1917-2017 history of The Ohio State University of the Department of Agricultural Communication, Education, and Leadership. The specific objectives guiding the study are: to organize 100 years of memories, milestones, and developments of the department and to organize photographs of students, faculty, and events. Historical research methodology will be used to analyze primary and secondary sources. Data have been gathered from a booklet published by the department on its 75th anniversary. Interviews will be conducted with current faculty. To date, the 100-year period has been divided into four segments. Within each segment, the data are organized by department chairs, faculty, graduate students, majors, department titles, and department organizations. Analysis is documenting the influences of the department to agriculture in Ohio for the past 100 years. For example, it was found that prior to the establishment of the department, students in the Agricultural Education Society undergraduate student organization educated their communities about the most up-to-date science and technology in agriculture. Data collection will continue in an effort to contribute to the recorded history that was preserved from the first 75 years of the existence of the department.

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Creating a Transformational Learning Experience in Laos

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International service learning (ISL) can produce transformative learning, but this high-impact pedagogy requires high levels of effort and resources to initiate. ISL occurs at the intersection of service learning, study abroad, and international education, carrying with it both the benefits and burdens implicit within each type of experience. This study describes the experience of the development process of a program designed specifically to foster transformational learning - an ISL program to Laos. A force field analysis of institutional barriers and opportunities combined with a needs analysis of different stakeholder groups yielded an innovative program. The resulting program was a hybrid between a paid internship, an independent study, and ISL program for six undergraduate students in Purdue's College of Agriculture. Program planners attempted to develop a model to: minimize the barriers that students within the College of Agriculture face in participating in study abroad activities in the summer; provide a transformative learning experience; and align with the needs of international collaborators and assist their operations in Laos. The findings of this case study suggest that this program model was successful in soliciting sufficient student interest and elicited continued engagement between the academic institution, local agribusinesses, and international partners to continue the program. This analysis suggests that significant institutional capacity and support much exist in both the academic institution and the community stakeholder to create an ISL program which meets the needs of all stakeholders.

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Teaching with Technology: An Innovation for the Millennials

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Keeping students interested to learn material occasionally has its roadblocks. These often stem from professors who use outdated, unengaging teaching methods either by misguided choice, simple complacency, or the lack of resources to gain innovative tools. To overcome such factors, teachers should be constantly reinventing class materials. This past fall and spring semester in 1124 Introduction to Animal Science, a new learning tool came to light that was extremely successful in engaging students at OSU. The innovation came in the form of QR codes. QR (Quick Response) codes can be used to interact with students by allowing them to use their most cherished possession: their phones. Teachers can create questions through ClassTool, and then print out corresponding QR codes. Once the free scanner application is downloaded on a student's cellphone, they can scan these QR codes and access the questions connected with each code. After scanning the questions, students can refer and review them at any time. Introducing QR codes to the classroom has made it possible to interact and engage with large classes of 150-400 students as they explore facilities in labs themselves without direct and constant attention from a professor. In addition, professors can assess the aspects of the QR codes that students liked and disliked improving class for the upcoming year. QR codes can help a tech savvy generation stay engaged in the classroom and offer teachers a versatile tool that can supplement any curriculum.

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Development of a New Precision Agriculture Competition for the NACTA Judging Conference

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An agricultural mechanization contest has often been part of the annual NACTA Judging Conference. However, when Kansas State University hosted the 2017 conference, it was not feasible to sponsor this event since facilities and support for traditional agricultural mechanical skills were not available. Instead, a new competition focused on precision agriculture was developed. This event was designed to address current curricular emphases at many colleges that have instituted precision agriculture programs, and the increasing career opportunities in precision agriculture. It was a cooperative effort between faculty at Kansas State and staff from John Deere company, with support from crop consultants. The new contest was conducted at the 2017 NACTA Judging Conference in April with 44 contestants from 12 different schools. The contest was designed around precision agriculture activities related to planting, spraying, and harvest. Within each section, three activities were completed: component identification on the newest equipment available, mathematical calculations related to equipment performance and efficiencies, and a situational analysis involving troubleshooting problems, adjustments to optimize performance, and/or using apps to evaluate scenarios. A fourth section involved analysis and interpretation of precision maps and data to assess reasons for field variability, identify production problems, and develop a management plan using a precision approach. In addition to addressing current curricular contest, the event facilitated bringing students from agricultural engineering and agronomy together in the same way that will likely be expected of them as they enter careers. Participants rated the event positively and strongly suggested it be continued in the future.

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Redesigning Greenhouse Crop Production Curricula for the 21st Century

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Greenhouse crop production has traditionally been synonymous with floriculture crop production. Though floriculture is still the most significant greenhouse industry, this trend is changing and greenhouses are being used to produce a wider range of plants including food crops and ecological service plants. Many greenhouse crop production curricula are focused on the production of herbaceous plants, including flowering potted plants, containerized annual and perennial bedding plants, cut flowers, and foliage plants. Ornamental floriculture crops are indeed the most valuable and widely-grown greenhouse crops, so an emphasis on producing these crops is any greenhouse curricula is warranted. However, greenhouse curricula should be modified to include classroom instruction and laboratory experiences in ecological and edible crop production. To address these needs, the greenhouse crop production curricula in the Department of Horticulture at Iowa State has been revised to reflect the change in crop production trends with the aim of producing more broadly trained greenhouse horticulturalists. A new course was developed on hydroponic food crop production. Additionally, an existing production course focused on spring annual and perennial bedding plants was modified to include ecological service plant production. In addition to developing lecture content, new experiential education opportunities were created to incorporate problem solving and service-learning into the laboratories. Ultimately, redesigning greenhouse crop curricula to include new and emerging crops will better prepare students for the evolving greenhouse industry.

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Experiential Learning via Team-Based Undergraduate Agronomy Research

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The ability to work effectively in groups is an increasingly desirable trait of college graduates. The scientific process is inherently a team-based process, and can also be utilized as a teaching tool for group working skills, while also developing skills in critical thinking and communication. Through an initiative at Kansas State University, a team of four undergraduate students in agronomy were assembled and tasked with the primary goal of exploring a single research question under the supervision of a faculty researcher. Several strategies were used to effectively execute the research project and facilitate student skill development throughout the project. Group meetings were held weekly with all four students and the advising faculty member to investigate the topic, design the experiment, organize weekly tasks, and delegate responsibilities. These meetings also provided a venue for critical thinking and discussion. Collaborative cloud software from Office365 was utilized for organizing group tasks outside of meetings and keeping notes and records available to all team members at all times. Development of detailed standard operating procedures helped develop technical writing skills while also limiting user-to-user variability in experiment results. Lastly, presenting results in a research poster at an undergraduate research showcase helped develop public speaking skills, while also reinforcing the communication component of the scientific process. This approach to team-based undergraduate research can serve as an example for innovative student research opportunities that develop many skill sets, but most notably the ability to work effectively in groups.

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Views of Soil Science Course Students on Textbook Cost and Format

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The continued rising cost of textbooks has become a serious limitation to affordable higher education. One potential long-term solution to rising textbook cost is open textbooks and laboratory manuals that are freely available online or in print. However, to effectively develop such resources, it's important to understand student views on textbook costs, as well as preferences for textbook format and mode of access. In order to gauge such views from students in an introductory soil science course, enrolled students were surveyed using an online survey during the 2016-2017 school year. Among fall 2016 respondents (n=107), 45% reported textbook cost influenced the number of courses they enrolled in, and 70% had forgone purchasing a textbook they couldn't afford. Of those who skipped purchasing a textbook, 85% thought not having the required textbook limited their ability to study effectively. Most students reported they would be more likely to enroll in a course if they knew it utilized a free, open textbook. Students were split over their preference for a printed copy (56%) compared to accessing a lab manual digitally (44%), however all students reported having at least one digital device available for accessing eBooks. The most commonly available devices were traditional laptops and smartphones. Of those reporting a preference for a printed lab manual, over 75% had printing options under $10. These survey results establish a clear need for free, open textbooks and lab manuals. Instructors developing open textbooks and lab manuals should choose formats that allow flexibility for student preferences.

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Monolith Cakes make Soil Science Easier to Digest

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The final review of soil properties in preparation for the final exam is uniquely presented through soil monolith cakes. Cakes are 10 cm by 64 cm which resemble the usual 10 cm by 117 cm soil monoliths. Various cake flavors and frosting techniques that closely match actual soil properties are used to demonstrate soil features. Students are engaged as they identify various soil properties and concepts which include among others: soil orders, native vegetation, drainage, parent material and structure. Students actively learn and recall objectives that are needed to perform well on their final exam. This technique has been used for more than twenty years and has become the highlight of the semester. Students testify that learning about soils would have been much easier if they had been exposed to these special monoliths earlier. Learning is made fun, and if the correct answers are given, this quiz is literally "a piece of cake".

301

The Most Distinguished Equine Programs as Ranked by their Peers

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Reputations of educational institutions have a strong influence on student choices, recruitment, retention rates, and stakeholder support. Reputations are socially constructed opinions held by people who are both internal and external to an organization. These opinions can be spread by word-of-mouth and media campaigns. Examining a program's educational reputation is an attribute that could be used to identify areas of strength and weakness to help with program improvement decisions. This exploratory examination was conducted to determine peer rated reputation rankings of equine programs. Equine educational professionals were asked to identify the top five programs in their respective region (North East, North Central, South, and West) and the top 10 nationally. Colorado State University, Texas A&M, and University of Kentucky were ranked both at the top of their region and at the national level. At the regional level, schools with overall smaller enrollment ranked high, although they did not rank at the national level such as Montana State University. From this finding, we concluded that program size can influence the notoriety at the national level. The information gained from this study will help guide research related to identifying characteristics that professionals see as essential in an effective program, which may include an evaluation of curriculum, quality of faculty, and student performance. Determining commonalities between effective programs could help guide decisions related to increasing effectiveness for students, faculty, and stakeholders, with an end goal of increasing equine education program alignment with industry needs.

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Creative Experience of Razi University's Students in English Language Teaching and Educational Video Production

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Razi University, Kermanshah, Iran

Now, the English language is one of the most important communication tools for students to use resources for scientific research and utilizes advanced technologies. However, in countries like Iran that English is not their native language, students unable to useful and effective communication despite the time, energy and huge capital. This failure can find in teaching - learning approaches such as inappropriate teaching methods and Educational content. In this regard, a group of PhD students from the Agricultural Education Department at Razi University in Iran, did an innovative action using Action Research to address this problem. They have translated and voiced seven videos from the Access Agriculture website as part of their studies. Access Agriculture managers helped provide some guidance and advice on translating and recording voice over's. This action strengthens the students' English language so that a number of the students are interested to continue the work to provide more videos in Persian. Doing the translations helped the students with their English, and even despite not having any experience in video production they also learnt a lot about how a video is produced. Furthermore, Farmers from the surrounding area can come to the college and watch the videos. They benefit from the videos in that they can replicate what they see and try them in their own fields.

304

An Analysis of Meat Industry Education in Public Middle Schools

Lindsey Skinner*, Amanda Reinhardt and
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Education of young people regarding meat production and farming is generally lagging many aspects of modern agriculture, especially in urban settings. In short, most adolescents have very little knowledge of where their food comes from. The objective of the current study was to examine education of urban middle-school-aged students in meat products and industry to prevent the spread of misinformation concerning the meat industry. The study focuses on 13 students' perceptions especially regarding meat selection and life-style choices. Participants completed a survey before and after the educational program regarding the meat industry through a Jeopardy-like game and discussion. The survey had two goals: to examine the student knowledge and analyze students' perception of individual learning before and after an informative game. Students were given a pre-quiz to determine initial level of meat production knowledge. The game was a Jeopardy-style game in which students were put into teams of 3 to 4 and were asked a series of questions relevant to the meat education. Analysis revealed that students did not feel more educated about the meat industry after learning with a $p=0.05$. However, results comparing initial quiz results and knowledge gained during the game showed that subjects retained at least half of the information learned ($p=0.04$) within the short 30-minute session. In conclusion, students did not feel like the game aided in learning but the students did test better after the lesson, proving effectiveness of the method.

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Educational Issues and Teaching Improvement Committee
The Educational Issues and Teaching Improvement Committee (a) solicits and responds to member needs regarding programs and activities for instructional improvement; (b) identifies, develops, sponsors, and conducts specific teaching and learning related activities such as blue ribbon presentations, round tables, symposia, and workshops at the annual conferences; and (c) provides recommendations and assistance to the Editor regarding the publishing of materials pertaining to educational issues and teaching improvement.

Committee Chair - Brian Pearson, Term 2016-2018

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Teacher Recognition Committee
The Teacher Recognition Committee: (a) establishes and publishes policies and guidelines for the teaching awards; (b) receives nomination materials; (c) determines the award recipients; and (d) posts the names of award recipients to the NACTA Teaching Awards website within four weeks following the annual conference*.*

Committee Chair - Wendy Warner, Term 2015-2017

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Journal Committee
The Journal Committee (a) provides recommendations and assistance to the Editor regarding Journal policies and content; and (b) reviews manuscripts submitted to the Journal for publication and abstracts for the Annual meetings. The Editor shall chair the committee. Members of the Journal Committee serve as the Editorial Board for the NACTA Journal.

Committee Chair - Rick Parker

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Journal Award Committee
The Journal Award Committee: (a) establishes policies and guidelines for the journal awards; (b) evaluates articles in the four issues of each volume of the Journal; and (c) determines the award recipients.

Committee Chair - Crystal Allen, Term 2016-2018

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International Committee
The International Committee: (a) disseminates items of interest to NACTA members concerning international agriculture; (b) encourages publication of articles on international agriculture in the NACTA Journal; and (c) serves as liaison between NACTA and other organizations involved in international agriculture.

Committee Chair - Laura White, Term 2016-2018

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Committee Co-Chair – Kelly Newlon

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Nominating Committee
The Nominating Committee: (a) selects nominees for President-Elect and open Director-Elect positions; (b) presents this slate to the Executive Committee for approval at the Fall meeting; (c) prepares ballots and distributes information about the candidates to the membership at least 90 days prior to the June conference; and (d) conducts the election via electronic voting. The Nominating Committee is composed of the three most recent past presidents of NACTA and two other members appointed by the President. The Immediate Past President chairs the committee.

Committee Chair - Tracy Hoover

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Membership and Public Relations Committee
The Membership and Public Relations Committee: (a) provides recommendations to the Executive Committee regarding membership policies and procedures; (b) conducts membership recruitment activities; and (c) conducts public relation activities. The Membership and Public Relations Committee is composed of the Membership Director who serves as chair and the Regional Directors, Regional Directors-Elect, Secretary/Treasurer, Editor, Association Liaisons, and other NACTA members.

Committee Chair - Jeannette Moore

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Undergraduate Experiential Learning Committee

The Undergraduate Experiential Learning Committee: (a) collaborates with the Judging Conference Liaison to intentionally extend the purposes of NACTA through the Judging Conference; (b) explores creative opportunities for NACTA to enhance undergraduate experiential learning; (c) develops stronger career preparation and skill development opportunities through enhanced relationships with agricultural and environmental business leaders and companies; and (d) works with the Educational Issues and Teaching Improvement Committee to recommend programs for the annual conference focused on the implementation and assessment of experiential learning activities.

Committee Chair - Dana Ladner

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Committee Co-Chair - Tracy Rutherford

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