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Oral Presentations

002

Mexican Agriculture Students Learn About the United States Cooperative Extension Model

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Many countries around the world have struggled to produce enough food to feed their populations. One of the main problems is the limited participation of higher education institutions in the development and transfer of technologies to agricultural and natural resource farmers and producers. This international situation is in direct contrast with the success of the United States, via the Cooperative Extension System, to efficiently apply scientific research to agricultural and natural resource practices, as well as youth and family development for more than 100 years. What if other nations replicate our Extension System? Would it yield similar results and allow for similar successes? This presentation describes an international initiative to introduce Mexican agriculture students to the U.S. Cooperative Extension System. A Midwestern land grant institution designed and delivered a four-week program targeting Mexican Agriculture higher education students. The students were enrolled in a summer academic program in their own intuition and each student covered the costs related to the experience. The objective of the program was to familiarize them to the U.S. Cooperative Extension Service The program outcomes included 1) the students identified and articulated cultural and socioeconomic differences between the Mexican and the American culture, 2) the students understood the need for the participation of higher education institutions in Cooperative Extension, and 3) the students appreciated the opportunity to be exposed to the latest agricultural technology. During the conference the authors will present the program and evaluation and the possibility of replicating the experience in other states.

003

Census of Baccalaureate Agriculture Teacher Education Programs in the United States

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The goal of teacher education programs in agriculture is to train professionals to be successful agriculture teachers. However, programmatic offerings are highly variable between programs. The purpose of this study was to examine the nation's baccalaureate agriculture teacher education programs of study to synthesize current coursework requirements. Seventy-five baccalaureate programs of study were analyzed. The mean number of semester credit hours was 126.5, and the mean number of credit hours in the areas of professional knowledge, technical knowledge, and general knowledge were 38.1, 41.8, and 36.3, respectively. Great variability was found within these descriptive measures when observing the standard deviation, minimum and maximum values, and configuration of courses within each category. This variability is most evident within the technical knowledge category with many programs specifically outlining certain competency areas and others providing limited guidelines. Coursework in Biotechnology systems ($M = 0.4$, $SD = 1.1$), Environmental systems ($M = 0.4$, $SD = 1.1$), and Food Products and processing systems ($M = 0.4$, $SD = 1.1$) had the lowest mean hours of coursework. Curricular decisions are heavily impacted by state certification requirements and university-wide requirements. The profession should engage in deliberate conversations to find the most effective configuration of courses to produce quality preservice teachers. Research should be conducted to determine the most effective course configuration. These conversations would provide the opportunity for the collective wisdom of the profession garnered through investigation of the literature and sharing knowledge gained through personal experiences, which can inform the decision making process at individual institutions.

010

Major Commitment as a Predictor of Student Success

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A commonly held assumption in higher education is that students who are undecided/indecisive about a major are at greater risk for attrition than students with a declared major. Theorists argue a key determinant of persistence and success in college is commitment. The current study sought to expand existing literature by investigating students' academic major commitment and its relationship to persistence of first-year students at Texas Tech University. This study illuminated new aspects of successful student characteristics which can in turn be applied to supporting all students. Findings indicated the persistence rate for participants was 85.4%, and 45.1% changed majors at least once during their first year. Number of major changes was significantly and positively related to persistence. Logistic regression showed prior credit, number of changes, GPA, attempted hours and earned hours could be used to explain 48.0% of the variance in first-year persistence. Additionally, for each major change, there was a 2.26 times greater likelihood a student would persist, and a student was 1.87 times more likely to persist for each point increase in cumulative GPA. This research showed the group of students who changed majors were not more "at-risk" than their peers who remained in their first declared major. Based on the evidence both in this study and in the literature, practitioners should encourage, not discourage, exploratory choices and major changing. Furthermore, as evidenced in this study, it has become increasingly important for first-year undecided students to be actively engaged in major exploration immediately upon entering college.

012

Is an Online Gathering Place Important for Distance Education Student Success? A Comparison of the Perceptions of Online Professors and Students

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This research sought to determine if professors, undergraduate students and graduate students had similar views regarding the importance of an online gathering place (i.e. student-to-student interaction venues) in distance education classes. The literature suggests that student-to-student interaction is important in distance learning. However, this recommendation is derived from research with face-to-face undergraduate classes from decades ago. Whether or not this recommendation is applicable to distance education students in the 21st century is open to debate. Data were collected from 135 graduate students, 407 undergraduate students and 85 professors; all of whom had experience with distance education classes. The perceptions of the undergraduate and graduate students were in agreement. Some students desire student-to-student interaction, however the majority of the students don't particularly like or want student-to-student interaction in distance education classes. They don't want group work, bulletin boards, course forums, Google groups or other types of online gathering places. They do not see this as contributing to their success. The perceptions of the professors were dramatically different. They believed student-to-student interaction was desired by students and was important in distance education classes. This difference in perceptions has implications for course design, student evaluations of teaching and student satisfaction with distance education programs.

013

Incorporating STEM in a Natuculture Laboratory for Teaching Agriculture and Non-Agriculture Students

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Faculty in a School of Agriculture [1890 land grant institution] identified the need to enhance student STEM knowledge. The project purpose was for students to develop Natuculture systems which are any human-made systems that mimic nature in human-disturbed landscapes. Objectives included: 1-providing experiential learning experiences; 2-demonstrating that food and biodiversity can be incorporated in urban landscaping; and 3-recruiting non agriculture majors to agriculture-related disciplines and preparing students for agriculture-related careers. The project (2010-present) occurred at local high schools (n=7) and at the respective institution using an interdisciplinary design. Each semester, scholarships were provided for students and faculty mentored students (approximately 100 per school) to complete a Natuculture system. Training was provided to familiarize high school teachers with the project. Postsecondary students of various disciplines, such as landscape, biology, agricultural education, English and art were mentored to convert highly trafficked, conventional lawn space on campus into a Natuculture Experiential Learning System Outside Laboratory (NELSOL). The NELSOL served as a sustainable and ecologically-friendly environment with minimal use of chemicals. Postsecondary students designed and installed a rain garden as a capstone project. As a result, a NELSOL continues to provide students with a unique context for enhancing STEM knowledge through various engineering-design projects. In summary, high school students have enrolled at the institution to major in agriculture (e.g. Animal Sciences, Bioengineering), as well as current high school students expressing an interest in attending the School of Agriculture's high school summer research program. It is expected that students will continue to add new STEM innovative design projects to a NELSOL. Thus far, 150 species of flora have been planted, 17 species of birds and 47 species of insects have been recorded on campus. The NELSOL continues to serve the community as a demonstration site for new biodiversity-friendly, food producing, artificial chemical free, water saving, soil enhancing, and climate change resilient paradigm in urban landscaping.

016

Focus on Efficiency

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The Water Resources and Policy Initiatives (WRPI) leverages the California State University's (CSU) system-wide academic excellence into an important resource for addressing the complex issues about water confronting California. The CSU is comprised of 23 campuses throughout the state that serve over 470,000 students. WRPI provides training opportunities through the commitment of the CSU Chancellor's Office and through various federal grants and agreements, including the Watershed Management Experiential Learning for USDA Careers. The USDA project was launched to serve underrepresented students at CSU under the hypothesis that long-term, repetitive exposure to experiential learning through paid internships results in improved persistence and performance. Over a four-year grant period, 221 students were served with 219 completing their internship. To date, 25 students have graduated with master's degrees and 40 have graduated with bachelor's degrees, with 14 beginning master's programs, one beginning a post-baccalaureate program, and one beginning a Ph.D. program. Twenty-two students were offered additional paid internships or job opportunities, and WRPI also awarded three Ph.D. scholarships. The average G.P.A. for interns increased from 3.27 to 3.42, and the project met the goals and expectations.

017

Use of Supplementary Materials in a Distance Education Equine Science Class

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Introduction to Equine Science provides students with course material via a course textbook and

recorded lectures, as well as supplemental materials. The supplemental materials are an important component of the class, as they demonstrate and practice concepts that may be poorly described in lecture; such as demonstrations of how to measure pulse in a horse, or a worksheet to practice the genetics of coat colors. The present study aimed to determine the use of such videos and supplemental material by students. Using the "Reports" function in the online-learning management system Moodle, views (which included the opening of documents) were recorded for each recorded lecture, supplemental video, reading or worksheet, in a summer online class of 24 students. These were compared to the students' final grades in the class. The results found that there was a significant relationship between the number of views of the lecture recordings with the students' final grades (r = 0.55, P = 0.066). While there was no relationship between the viewing/downloading of the supplemental material and final grade, 3 students who viewed the most supplementary materials received A's in the class. However, there were also 10 students who received A's who viewed less than 10 of the 46 supplemental files. These data suggest that students do not appear to require these supplemental materials to do well in the class and this is of concern to the faculty member, such that students may not be fully grasping some concepts despite achieving good grades.

018

The Use of a Learning Game: Trot to Trophy, In Equine Science

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Trot to Trophy is a learning game designed for web and mobile use ("app") for students in Introduction to Equine Science. The game has components for learning the external and internal anatomy of the horse, tack and equipment, general course concepts, nutrition; and in later levels involves game play in horse ownership and equine disciplines such as show jumping and racing. The game was designed to provide an interface to enhance the learning experience for students with little to no equine background as well as to provide a fun practice tool for those with extensive equine backgrounds. Seventy students in the fall semester of 2015 completed a survey regarding their use and experience with Trot to Trophy, using a Likert-type scale of 1-5, where 1 represented "not at all" and 5 represented "yes, definitely". Twenty-seven percent of students (19/70) reported that they never tried the game. Of the remaining 51 students, 24 (47%) responded as either a 4 or 5 to the question "Do you think Trot to Trophy enhanced your education about horses?". Thirty-seven percent (19/ 51) believed the game helped them earn a higher grade in the class (by reporting a 4 or a 5 on the scale). As evidenced by the final question "do you think learning game apps can be useful in your education", where 67% (47/70) of all students responded positively (4 or 5 on the scale), games appear to be a potential useful teaching and learning tool.

020

Bee Smart: The Buzz on Pollination and Pollinators

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The University of Hawai'i at Mānoa's College of Tropical Agriculture and Human Resources has developed a virtual field trip on agricultural pollination. Bee Smart: The Buzz on Pollination and Pollinators is a series of short videos on the topics of pollination, pollinators and bees, pollinator threats and honeybee fun facts. The videos are available on the Bee Smart website, which includes links to additional resources. Bee Smart is the first in a series of electronic field trips covering important issues facing food and agricultural systems and natural resource management in the State of Hawaii. These field trips will be shared among the academic programs that comprise the USDA-NIFA supported Agribusiness Education, Training and Incubation (AETI) Program within the University of Hawai'i system. The AETI Program represents a consortium of University of Hawai'i campuses on four different islands, with the common goals of providing education and training. By sharing virtual fieldtrips among the AETI campuses, students will gain experiences and knowledge available on other campuses and other islands in the state of Hawaii in an efficient and cost-effective manner.

021

Developing Project Based Learning for Agricultural Systems Technology Courses

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The Agricultural Systems Technology (AST) program sought to demonstrate the effectiveness of integrating project-based learning (PBL) across core courses of the major. Faculty collaboratively integrated PBL activities within six core agricultural systems courses to enhance student laboratory experiences throughout the program. Collaborative efforts between instructors of core course sought to scaffold instruction to assist students in making meaningful connections in order to promote a systems approach to problem solving. The objective of this approach was to facilitate student-driven learning activities and the application of critical thinking in realistic situations. Students selected projects that are personally meaningful as they relate to accomplishing course learning objectives. Instructional strategies included demonstrations with models, utilization of student-feedback rubrics, skill acquisition activities, and dialogue to develop students' metacognition. Students solved problems through investigation by organizing their research and applying acquired knowledge to complete a project. Students reported the results of projects to demonstrate conceptual understanding of key objectives within courses. Program coordinators noted the complexity involved with managing laboratory facilities and the skill levels required on the part of the students made using PBL extremely time intensive for the professor and less experienced students. The selection of inappropriate projects or an over estimation of abilities may result in a less than effective experience for students and faculty A recommendation is to utilize student mentors and/or other faculty to serve as individual project supervisors. Student mentors might include more advanced graduate or upper-class undergraduate students with design experience.

022

Farmers' Utilization of Auto-Guidance Technology and Training Needs

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The purpose of this descriptive-correlation study was to examine the variables associated with Northern Utah farmers' adoption of auto-guidance technologies in alfalfa and corn silage production and determine training preferences. Participants in this study engaged in an experiential training session utilizing an auto-guidance system comparable to those available for use from agricultural machinery dealers. A survey was administered to identify farmers' adoption level of auto-guidance technology and preferences for related training. Attendees who had used auto-guidance technology indicated they used this technology with tractors (36.1%) and self-propelled windrowers (32.8%). Participants ranked three sections of the presentation by how effective they were at helping them learn about auto-guidance. Most participants' (59%) perceived that the hands-on portion using the laptop with the simulator was the most effective at helping them learn about auto-guidance. There was no significant relationship ($\chi2$ (1) = 0.579, p = 0.447) between education level and use of auto-guidance. There was no significant difference in age between users and non-users of auto-guidance, t (50) = 0.50, p = 0.619. Only seven participants identified using university and Extension professionals as a source of information on auto-guidance while 15 participants (48.4%) reported using the internet as a source of information of auto-guidance technology. Extension professionals may consider improving their internet market share when programing for these participants using sites such as a YouTube channel.

024

Are Agriculture Students Prepared for a Global Marketplace?

Melissa Hendrickson*, Elizabeth Wilson, Jay Jayaratne and Wendy Warner
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The world of agriculture and agribusiness has become a global marketplace. Are agriculture students prepared to enter this multicultural workplace? One measure of this is global mindedness of students. The objective of this study was to examine incoming students in the associate's degree (N= 125) and bachelor's degree (N = 261) programs in the College of Agriculture and Life Sciences at North Carolina State University to determine their views of the world and their place in it. Global mindedness parameters of students were evaluated and the global mindedness scores of these two groups were compared to see if there were differences between the two groups. Results of this research were that the associate's degree students exhibit a lower level of global mindedness than bachelor's degree students in disciplines of agriculture. Additionally, global mindedness can vary by other demographic characteristics including age, gender, country of birth, second language ability, and whether a student had already participated in an international program in the past. Previous research links higher levels of global mindedness with certain desirable attributes. These include flexibility, openness to others, and sensitivity to cultural differences, among others. Higher levels of global mindedness imply a higher degree of interest in or caring about global and cultural issues. Our students will be the workforce for a global agricultural system. Understanding where students are in terms of their level of global mindedness could better prepare these students for the agricultural marketplace that interconnects cultures, countries, and customs.

025

A Model to Predict a Student's Intention to Study Abroad

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The value of study abroad programs for graduate and undergraduate students has been well researched. Little work has been done at associate's level related to study abroad, especially with agriculture students. The objective of this research was to investigate perceptions of incoming students in associate's (N = 125) and bachelor's (N = 261) degree programs to determine their perceptions of the value of study abroad programs, factors that would affect their participation in study abroad, sources of funding, and their perception of whether or not they would participate in a study abroad program. Though often neglected or undervalued, internationalizing the curriculum is still important in producing work-ready students. Results of this research were that students identified benefits of studying abroad including cultural skills enhancement, improved academic skills, enhanced employability, improved communication skills and others. They also identified key factors that would affect students' participation in study abroad including program cost, integration into degree plan, program goals and administration, location and others. Students were able to identify sources of funding to help pay study abroad fees. A model to explain whether a student intended to study abroad was generated through stepwise regression. The best fitting model consisted of three independent variables: global mindedness, gender, and previous international experience. Results could be useful for targeted student recruitment purposes.

027

Addressing Food Insecurity via a Participatory Approach to International Service Learning

Dennis W. Duncan, Nicholas E. Fuhrman and Eric D. Rubenstein
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As institutions of higher education place more emphasis on experiential learning opportunities for undergraduate and graduate students, faculty and administrators are being charged to develop new experiential learning opportunities. These include courses with laboratory sections, more and diverse internship options, and study abroad programs. Faculty at a southern land-grant university sought to address the need for increased experiential learning opportunities coupled with the importance of university students gaining a greater

awareness and understanding of food insecurity issues both locally and globally. This was addressed by developing a global service learning program that required students to connect with youth and seniors in the local university community and in Scotland. Prior to the start of the semester, faculty developed the groundwork for a sustainable study abroad program by visiting the host institution, building bridges between faculty and administrators on both campuses via distance technology, securing service learning sites near both university campuses, and developing pedagogical resources. In preparation for the service learning projects, students conducted needs assessments in cooperation with local leaders and teachers, secured resources for engaging in service projects in the local community and abroad, and prioritized service activities they would engage in working alongside stakeholders. This participatory approach resulted in students feeling a sense of ownership and personal commitment to the project, gaining valuable leadership skills, increased reflective abilities, and an appreciation for community programs.

028

Small Animals in the College Classroom: Student Reactions and Educator Recommendations

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When used as teaching tools in the college classroom, small animals (turtles, snakes, salamanders, insects, and baby chicks) can enhance student and instructor engagement. Animals used in teaching demonstrations can also strengthen student-to-instructor and student-to-student interaction. However, little is known about the influence animal type has on student engagement and communication ability. The objectives of this study were to (1) reveal historic trends in the use of animals in teaching, (2) describe student reactions to their use of animals during teaching demonstrations, and (3) provide recommendations for using animals to enhance interaction in the college classroom. A comprehensive review of the literature on using small animals in teaching revealed that domesticated mammals, specifically dogs and guinea pigs, are used most often in elementary classrooms. Little research exists

on the use of small animals in the college classroom. Student reflective assignments and focus group conversations revealed that using animals during teaching reduces classroom distractions, encourages learners to interact with their instructor, and promotes adaptability on the part of the instructor and student. Animals were often referred to by name (e.g., "Mitsy") and animals with potentially negative stereotypes (e.g., snakes), which students had little previous experience with, were those mentioned most often because of the reactions elicited from audience members. These results suggest that naming the animal teaching tool helps form a student-animal connection and, when used in the college classroom, animals can increase student engagement. College faculty should consider using small animals in their classrooms to strengthen the overall learning environment.

029

Producing Teachers with a Balance of Content and Pedagogical Knowledge: Recommendations for Success

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Teachers are expected to develop a wide range of knowledge to contribute to their classroom success, including pedagogical, content and pedagogical content knowledge (PCK). PCK is the transformation of content and pedagogy to create a knowledge base unique to teachers. Agricultural teacher educators recognize PCK as a critical knowledge base for teaching. However, research has concluded that preservice teachers need more PCK development opportunities in their teacher preparation curriculum. To assist with the growth of PCK, the Agricultural Education program at the University of [State] developed a series of content courses specifically "for teachers." These courses were taught by content and pedagogy experts to ensure that students not only learned content, but also various instructional strategies for increased student acquisition of agricultural and natural resource knowledge. The purpose of this study was to describe the processes used to develop such courses and recommend best practices for others hoping to build PCK through courses with blended content and pedagogy training. Agricultural education faculty

selected content experts known for their utilization of instructional strategies. Faculty members were then asked to develop courses with pedagogical experts that utilized PCK. The most successful courses contained educational experiences where pre-service teachers were: given flexibility to develop lessons where content was used to promote "career ready" (e.g., communication and leadership) skills, required to build measures for evaluating learning other than through formal tests, and required to teach on camera for critical reflection. Faculty in agricultural colleges can utilize these skills to enhance students PCK abilities.

031

Learning Outcomes Assessment: Can Engaged Scholarship Experiences Improve Student Learning?

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Student engaged scholarship experiences, broadly defined as internships, research, service learning, and study abroad, have been highly touted as valuable, with claims that these experiences enhance classroom learning and student success. We evaluated the engaged scholarship experiences of graduating seniors over several semesters through exit surveys to determine if the number of engaged experiences in a student's academic career had any relationship to academic performance. Students reported their engaged scholarship experiences in a written exit interview, and confirmed in an oral interview with the program coordinator. Numbers of engaged scholarship experiences were determined for each student and compared to grades in specific courses as well as the student's cumulative grade point average. All students (n = 25) interviewed had from 1 to 6 engaged experiences during their undergraduate academic career. We determined that students with 4 – 6 experiences obtained significantly higher (p = 0.007) cumulative grade point averages than those students with only 1 experience, whereas students with 2 – 3 experiences did not have significantly higher GPAs that those with 1 or 4 – 6 experiences (p = 0.104 and 0.500, respectively). Total SAT scores for each student were compared to the number of engaged scholarship experiences to determine if

overall student ability (as measured by incoming SAT scores) potentially influenced the number of engaged experiences. There was no significant difference in high school SAT scores regardless of subsequent numbers of engaged scholarship experiences (p = 0.173). Our research provides support for the importance of engaged scholarship experiences for student success.

033

Participants' Perceived Importance and Application of Mentoring@Purdue Program Seminars and Workshops

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As more women and underrepresented minorities (URM) seek advanced degrees, it is increasingly important to provide equitable guidance and supportive environments that fosters a successful matriculation through graduate school. Mentoring is especially important to individuals who are in an environment that is culturally different from their own. Started in 2013, the Mentoring@Purdue Program (M@P) seeks to enhance the experiences of women and URM graduate students in the College of Agriculture through mentoring. An evaluation of the M@P workshops and seminars was conducted to determine participants' perceived importance and application of each session. From 2013 to 2015, 225 faculty, staff and graduate students from various colleges engaged in 16 workshops and seminars on a variety of mentoring topics. Participants were asked to evaluate workshops and seminars at the conclusion of each session. Workshops and seminars were rated on a 1-5 Likert scale with scores ranging from 1 (None/Not at All) to 5 (Absolutely) regarding participants' perceived importance and application of each session. Of the 16 seminars and workshops presented, 13 had at least a combined 50% participant agreement of "A Lot" or "Absolutely" when asked if a workshop or seminar increased their understanding of the importance of mentoring. Additionally, 14 of 16 seminars and workshops had a minimum combined 50% agreement by participants of "A Lot" or "Absolutely" when asked if the seminar or workshop had applicable examples they can utilize for mentoring. Graduate mentoring programs should be de-

signed to encourage the development of supportive relationships between faculty and graduate students.

035

Online Management of Experiential Learning Process and Grading

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The NC State University Animal Science Department offers two student internship credit opportunities (off-campus ANS 492, External Learning Experience and on-campus ANS 493, Research, Teaching, or Extension Experience). In the past ten years, 238 students have completed ANS 492 (622 credit hours) and 428 have completed ANS 493 (1071 credit hours). The process, originally handled entirely by paper, involved establishing a Memorandum of Agreement (MOA) between the internship sponsor and student, submission of a final reflective paper by the student, approval of both the MOA and paper by the student's faculty advisor, and final approval (and grade assignment) by the faculty Internship Coordinator. In the spring of 2013 an online system was developed to further enhance students' awareness of available internships, stream-line the system for internship approval and final reporting process, and improve record keeping. The system consists of a website that interfaces with a database that facilitates the approval process electronically. The website is organized into the following pages: home, available internships, student testimonials, and other resources. The home page contains instructions on initiating an internship and establishing the online memorandum of agreement between the student and internship sponsor. Once the internship sponsor approves the MOA it automatically routes to the student's academic advisor and then to the departmental internship coordinator for final approval. The multilevel system of approval provides checks and balances ensuring appropriate credit is assigned and justified. The online system has improved internship promotion, reduced faculty time spent approving internships, and enhanced record keeping.

041

Compound Teaching and Learning

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There is significant literature and evidence that in many instructional settings, the germane and intrinsic load are substantial and therefore extrinsic load must be minimized for learning to be accomplished. Yet, considering efficiency, if assignments or demonstrations can be constructed such that two components of teaching and learning can be integrated, there is opportunity to reinforce knowledge and/or skills which may, a priori, be at a novice level with exposure to new material. The objective of this presentation will be to demonstrate this compound teaching approach using several assignments from a computation and communication course. Examples will be presented where it might be inferred that there were "subliminal" learning objectives. Without students' conscious awareness (until pointed out by the instructor), students were extending skills in more than one topic area simultaneously. These class exercises and assignments were designed to incorporate compound learning to raise capability from novice or beginner toward competent, proficient, and expert in complementary topics. Examples include: 1. Setting up a data sheet to facilitate analysis of multiple samples in a clear and compact manner while introducing a new sampling technique. 2. Compiling electronic cost and capacity information while learning software tools. 3. Simultaneously demonstrating subject matter, communication, and software mastery by packaging a project electronically. 4. Boost problem solving ability and apply recommended spreadsheet practices while learning new technical subject matter. These assignments seem to enhance self-confidence and self-confidence positively impacts motivation.

042

Augmenting Reality in a Plant Science Lab

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There is great potential to incorporate new technology platforms into existing courses in an effort to enhance the classroom learning environment. One such platform that has received minimal attention in the literature is the effectiveness of incorporating augmented reality applications (apps) into educational settings. Therefore, the objective of this research was to determine the impact of using an augmented reality app for mobile devices on content retention of students (N=50) enrolled in an introductory plant science laboratory (PSS 1313) at Mississippi State University during the spring, 2015 semester. An augmented reality app was introduced into the three laboratory sections. The app used was ZAPPAR, which brings a traditional word document filled with print or stationary photos to life through either revolving photos and/or multiple videos. ZAPPAR was implemented for three different laboratory exercises over the course of the semester. In order to quantify content retention following the use of ZAPPAR, all students took a quiz the following class period on material covered in the previous lab. Each lab section rotated using ZAPPAR to determine any potential differences in quiz scores. All students used ZAPPAR at least once throughout the course of the semester. Regardless of the laboratory exercise, a 20% increase in quiz grades was noted when students used ZAPPAR vs. receiving the information through a traditional lecture led by the professor. Overall, incorporating ZAPPAR into the laboratory exercises significantly enhanced student content retention and students responded positively to using the technology and highly recommended it's use in future semesters.

043

Shortkeys: The Key to Efficient Grading Online

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ShortKeys is a computer program that can help cut down the time needed to grade online-based assignments such as term papers, lab write-ups, or problem sets. It can help take excessive steps out of commenting and giving feedback on assignments. ShortKeys runs in the background of your computer so there is not an additional window open for you to manage. Instead of typing the same comment numerous times, you will simply enter your shortkey, which can be as simple as 2-3 letters. Here is an example shortkey: "==ten", which will insert the comment "Round your final answer to the tenth." into the submitted document or grading system (Moodle, Canvas, Blackboard, etc.). After insertion, comments can be edited to reflect more specific feedback. It can shorten and simplify grading and allow you to focus your time on other parts of your course. It allows you to avoid spending extra time with assignments when the feedback is consistent across students.

045

Student Reflections on Service-Learning in a Greenhouse Hydroponic Food Production Course

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Service-learning is a proven pedagogical method to increase student engagement and promote deep learning, and it has been used successfully in many types of horticulture courses. The purpose of this research was to determine how a service-learning component impacted student engagement and learning in a greenhouse hydroponic crop production course in fall semesters 2014 and 2015. Students completed reflections at three points in the course and each had a different focus. The first prompt (week one) followed a presentation on food security and an introduction of the service-learning project by the community partner (a local food bank and free meal program). The second prompt was completed after students completed their volunteer experience (mid-semester). The third prompt completed the last week of class focused on the overall impact of the service-learning experience including connecting course content to the production of hydroponic crops in the greenhouse, donating the harvested crops, and the volunteer experience. Data between years was pooled and analyzed to determine themes and sub-themes across all three reflections. Common themes from the first reflection included enhanced awareness of local food insecurity, an understanding of the community partner's role in the community, and a positive response to the service-learning project. Themes from the second reflection included student and food bank client empowerment and increased

student empathy. The most common theme of the final reflection was an inward focus from students on what the service-learning project meant to them as well as how they think their work impacted the food bank clients.

047

Intentional Reflective Practice to Wrap-Up the Semester

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I see it on the horizon and know it is coming- but the somewhat frenetic few weeks at the end of the semester always seem to catch me a bit off-guard. One practice I have implemented over the past few semesters is to think purposefully about how I want to wrap-up my course. Rather than just being swept along with the pressure of limited time and energy to finish the course, I've reflected on the arc of the course over the semester and have led my students through doing this same type of reflection. Using the course learning objectives as a framework I lead students through a series of exercises that require them to reflect and compare their skills and abilities from the beginning to the end of the semester. Using Bloom's Taxonomy as an additional framework students explore the type of thinking and learning that was required to complete each assignment. The final framework focuses on both general and specific examples of how the course has prepared them to be professionals in the landscape industry. I've found this activity helps give both the students and me a sense of closure. This session will discuss the various frameworks used in this reflective practice and how they can be used to help both students and the instructor wrap-up a course with a shared sense of accomplishment.

051

Cultivating Student Learning though Undergraduate Interdisciplinary Research: Creative Inquiry

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Creative Inquiry, at Clemson University, offers a unique opportunity for undergraduate students with an imaginative combination of engaged learning and undergraduate research. Through this opportunity, undergraduate students are able to work with professors/mentors to research a topic in which the research is student centered. The interdisciplinary creative inquiry designed by Dean George Askew, *The Analysis of a Bacon Cheeseburger*, allowed students from Agricultural Education, Agricultural Mechanization and Business, Agribusiness, and Food Science to work together. The focus of this project was to analyze the economic impact at each level of production to signify an end cost to the consumer. This research topic represents hundreds of jobs and critical levels of economic growth and development for the American economy in agriculture fields. In order to determine what processes were needed to make a bacon cheeseburger, students had to critically think about the individual food components of the product and research each production aspect of those components. From the importance of horticultural knowledge, to growing grains and feed for hogs and cows, to the integration of animal sciences into the production of food; as well as some of the more technical based jobs such as agricultural mechanics and agribusiness for marketing, this research encompassed all areas to better inform the public. Through interdisciplinary learning, this group of students came together and researched each aspect of this project from seed to consumer pricing and designed a presentation to educate the general public on the complexity of economic analyses of food production.

055

A Picture's Worth a Thousand Words: Using Images to Engage Online and On-Campus Students in Meaningful Reflection

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Researchers regard reflection as a crucial part of the learning process. Reflection through nonlinguistic representations, which require students to process information by constructing images and explaining those images to others, allows stu-

dents to explore their perceptions and understanding about a concept without reliance on language. This project sought to describe the perceptions of online and face-to-face students enrolled in a College of Agriculture, Food, and Life Sciences Research Methods course regarding nonlinguistic reflection assignments. Objectives were to describe students' perceptions of 1) the nonlinguistic reflection assignments; and 2) the assignments' impact on their course-related stress, course-based relationships, and performance in the course. Students were asked to complete weekly visual reflections regarding their feelings related to the course content. Quantitative course evaluations were compared between 2014 (during which nonlinguistic reflections were not required) and 2015 (during which nonlinguistic reflections were required). Additionally, one-on-one interviews with students were used to gather data regarding their in-depth perceptions regarding the assignments. Student evaluations displayed a 17% increase in mean overall course rating and a 23% increase in mean overall instructor rating between 2014 and 2015. Interviews indicated students perceived the nonlinguistic reflections positively, noting their influence in improving their relationships with the instructor and between one another, their management of the course, their stress level in the course, and their overall performance in the course. These results suggest nonlinguistic reflections can be a useful tool in enhancing students' conceptual understanding and stress management in online and on campus classes.

056

Novel Education Abroad Experience Via Advanced Seminar Course Structure

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Education abroad experiences foster development of global perspective and openness to cultural diversity. Study abroad experiences are typically offered to undergraduates as faculty-led excursions, internships, or semester-long academic institute exchange programs, which optimally involve the articulation and attainment of well-conceived student learning objectives. Nonconventional experiences such as participating in international conferences can provide exemplary opportunities for learning but may lack a firm educational structure. To maximize student learning while participating in an international conference, a seminar was created to promote exposure to, and subsequent critical reflection about, a variety of topics relevant to postharvest loss prevention, the main theme of the conference. Seven undergraduate honors students participated in the First International Congress on Postharvest Loss Prevention held in Rome in Fall 2015. Prior to the conference, students engaged in background research aligned with their research interests. At the conference, students attended presentations, interviewed scientists, and collected information to help them prepare to write a technical article. Post trip, the technical articles were subjected to rigorous peer and instructor reviews in preparation for publication in i-ACES, a new online undergraduate research journal offered by the College of ACES, University of Illinois. The experience was described by students as transformative, for example: *"Going to Rome has been the high point of my college experience. It was incredible to have the opportunity to work with the world's leading authorities in Postharvest Loss to improve the lives of people around the globe."*

061

Creating a Cadre of Critical Thinking Scholars

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If students are to learn to think critically, focus must be given to instructing educators on the intricacies of critical thinking and how to implement this practice in courses with intentionality. The objective of this presentation is to describe the experiences and impacts of a diverse cadre of faculty participating in a Critical Thinking Academy during the 2015 inaugural year of instruction and implementation. A narrative analysis of written perceptions showed that professors felt better equipped to use critical thinking strategies in their courses following the experience; specifically, that critical thinking instruction must be a deliberate exercise rather than a bi-product of traditional instruction. Participants saw application and interaction with other practitioners as a critical component of the learning experience, particularly the network approach to activity development and continuous improvement resulting from lessons

learned. A critical thinking assessment tool was an outcome of the academy, and was pilot tested in several classrooms. Faculty instructors and student participants found the tool useful in facilitating exploration of critical thinking and developing definitions of assignment quality. While critical thinking is frequently identified as a desired outcome for students, it is rare for students to be engaged in a holistic examination of critical thinking, or to be taught the skills to reshape their own thinking. Critical thinking is a cornerstone in education learning outcomes, and essential to developing effective and competitive work-ready leaders and professionals. Further focus must be given to faculty development and course implementation.

064

A College-Wide Project to Improve Student Writing

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In 2014-15, two College of Agricultural, Consumer and Environmental Sciences (ACES) faculty members at New Mexico State University drafted a writing assessment rubric for college use as part of a university-wide initiative to improve student writing. A 2015-16 team of six ACES faculty members formed to improve the rubric for college-wide use. They applied recent assessment experiences using the rubric to simplify it at the 2015 New Mexico Higher Education Assessment Association Summer Retreat. They then conducted a norming workshop with 14 faculty assessors representing seven of eight ACES academic units to determine instrument reliability and interrater reliability between assessment rounds. The workshop had three rounds, each assessing writing samples from Agricultural Economics and Agricultural Business; Fish, Wildlife and Conservation Ecology; and Hotel, Restaurant and Tourism Management assignments. Norming discussions were held after assessing each of the three Round 1 papers. The assessors then assessed six papers independently. Through the workshop, the rubric was found to produce reliable results when two or more assessors evaluated the same writing sample. Of the five writing dimensions assessed, "Content and

Critical Thinking" produced the most inconsistent results. Interrater reliability between assessors on the same writing samples did not increase in later rounds. Based on these results and workshop feedback, the team will split the "Content and Critical Thinking" dimension of the rubric. Future norming workshops will assess only word-processed samples from assignments that a multidisciplinary faculty group can understand. Norming discussions will be held on six papers before allowing assessors to work independently.

066

Picture This! Using Images to Stimulate Nonlinguistic Reflection in Undergraduate Agriculture Courses

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Reflection is a regular component of undergraduate courses; however, written reflection may not meet the needs of all students. The purpose of this research was to determine students' perceptions of nonlinguistic reflection in a face-to-face undergraduate professional presentations course (N = 47) and team leadership course (N = 26). Students were asked to select an image that represented how they felt about a specific topic related to course objectives, and provide a written response to questions connecting their classroom experiences to real-world situations. Students completed a satisfaction instrument on the nonlinguistic reflection experience in relation to the traditional written reflection model commonly used in classrooms. Results of the satisfaction instrument showed students preferred reflecting nonlinguistically compared to the traditional written reflection. The visual component with the written explanation gave students an opportunity to think critically and creativity about learned concepts. Students indicated they would like to see this assignment in other classes. The researchers benefited from this assignment as well. Nonlinguistic reflections offered opportunities for the researchers to check understanding and provide individualized support to students throughout the semester. Because the researchers observed a positive outcome in student understanding and

application of course content, the assignment will be implemented in future undergraduate courses. Some challenges occurred. Initially, students became overwhelmed with the expectations of the assignment and confused as to what type of image to provide. Instructors should encourage students to think critically about the topics covered in the classroom and creatively apply those concepts to the image they choose.

067

Listening and the Agricultural Workforce

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Employers have a history of valuing soft skills in their employees, including communication. Previous research has identified listening as the skill most commonly in need of improvement, but with minimal research indicating how improvement should ensue. This grounded theory study explored the role of employee listening in the agricultural workforce. Managers from a variety of agricultural companies were interviewed and five themes emerged. The managers identified how listening as a direct impact on the business by increasing efficiency, safety, and responsiveness to customers. They also had specific behaviors they expected when communicating information to their employees. Besides traditional non-verbal cues, managers identified taking notes and asking clarifying questions as positive behaviors. Additionally, they indicated a set of behaviors associated with employees who were not listening. A variety of methods including mentoring, debriefing, and peer-to-peer communication were used to help employees become better listeners. Managers were also reflective of their own behaviors by identifying barriers in the listening process. The final theme explored technology's role as both a hindrance and an enhancement to the listening process. Recommendations for practice include making students aware of the behaviors positively associated with listening and raising awareness among managers of the positive benefits associated with mentorship of employees. Further research should be conducted to explore current gaps related to listening such as financial cost of not listening, why employees fail to encode information, and the best practices for improving employee listening behaviors.

068

Planning for Success: Student Preflection on the Impacts of Behavioral Styles on the Success of a Course Project

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Team success is, in part, a product of individual team members' behavioral styles and their ability to interact with the behavioral styles of other team members and stakeholders. Preflection has been found to heighten student awareness in a given situation and enhance the overall learning experience. The purpose of this study was to explore students' preflections on the potential impact of behavioral style on the success of a team project in a capstone course. Students completed the DISC Behavioral Style Assessment to identify their behavioral style and attended a presentation about the meaning and application of their results. In response to four prompts, students processed their behavioral style and preflected on potential uses of the report information in their project, how their behaviors may contribute to project success, and how they may need to flex their style to increase team success. Students were generally aware of their behavioral styles, yet were somewhat disconcerted with how they may be perceived by others, especially when stressed. Students preflected on specific ways to leverage the positive behavioral styles of each team member, ways to enhance communication among their team, and how they may use and flex their behavioral style to create a more conducive environment for project success. Intentional preflection allowed students to process their behavioral style and analyze and plan for team success in a capstone project. The preflections will be analyzed in conjunction with the end of course reflections to determine the impact of students' behavioral styles on project success.

070

Using Curriculum Mapping and Assessment Techniques to Evaluate a Food Science Curriculum

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Development and assessment of learning outcomes on the curriculum and university level, as well as alignment of those learning outcomes to program content, have become increasingly common over the past few decades. One useful tool for curriculum evaluation is curriculum mapping, which creates a visual map of all courses in the curriculum and their relationships with curriculum learning outcomes. Curriculum maps often include assessment tools for course and curriculum learning outcomes. To address university requirements for assessments, the School of Food Science, a joint program between the University of Idaho and Washington State University, completed a curriculum mapping and assessment exercise for the undergraduate curriculum. The goal of this project was to determine curriculum–learning outcome alignment and degree of student mastery of selected outcomes. To start the mapping process, curriculum learning outcomes were refined from existing curriculum learning outcomes for better alignment with university-level learning outcomes and the Institute of Food Technologists Core Competencies. Undergraduate courses were then mapped to the Core Competencies; several competencies were assessed to determine student mastery. These mapping and assessment activities revealed multiple potential gaps and redundancies in course content, as well as points to address in terms of student competency. These results will be used to refine undergraduate curriculum content, providing undergraduate students with a high-quality education needed for a successful career in food science. This curriculum mapping and assessment process may be used by any department seeking to evaluate curriculum–learning outcome alignment and student performance.

071

Instructional Techniques that Cultivate Writing Skill Mastery

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Universities are becoming more concerned with course and program learning outcomes. Writing well is a major outcome for many agriculture programs and perhaps the most important outcome for students enrolled in advanced agriculture media writing courses. Instructors who want to maximize learning outcomes will implement the most effective techniques to cultivate skill mastery, but what do agricultural communications students see as the most effective techniques? The study was designed to investigate student perspectives on which writing techniques were most effective in moving them toward writing skill mastery. For three consecutive semesters, students (N = 131) were asked systematically for multiple written critical reflections throughout the course. Every semester the same patterns emerged after analyzing the data using open coding. Students consistently identified constructive feedback in a structured, regular format from the instructor and peers as most helpful. It provided a human connection. Students benefitted from a structured method of peer revision and editing forcing certain kinds of input. Lab work designed to reinforce lecture content motivated students to strengthen new skills and maintain attendance. Providing increasingly difficult examples of attribution, paragraph construction, and sentence structure also helped students achieve mastery as instructors provided guidance. Students were asked to reflect on their writing skill mastery and noted the reflections reinforced pathways for how they developed mastery. Students noted the reflections played a role in increasing skill confidence. As triangulated assessment data and the reflexive journal confirm, implementing instructional techniques students see as most effective increases learning outcome achievement from students' perspectives.

073

Using a University Class to Develop and Test an 8th Grade Climate Science Curriculum

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The objective of this project was to develop a climate science curriculum for 8th grade physical science classes in New Mexico. It utilized students in an upper division university class preparing secondary agriscience teachers and an Extension youth agricultural science center serving an underserved Hispanic community as a vehicle

for developing and piloting curriculum. The curriculum has the following lessons: Weather and Climate; The Greenhouse Effect; Measuring Temperature, Precipitation and Wind; Reducing Greenhouse Emissions in Agriculture and Natural Resources (ANR); Adapting to Climate Change in ANR; and Climate Science Careers. The Fall 2015 class featured a lesson demonstrating the greenhouse effect containing a role-play and a mini-greenhouse experiment with varying heat trapping layers. All of the university students felt these opportunities to plan and pilot their lessons met or exceeded expectations. All responded that they liked the experiences and learning how to teach by actually teaching versus listening in a lecture-based course. They learned the value of planning, how to adapt a lesson to changing conditions, how to keep students engaged and make the material relevant to them, and how to be outgoing and enthusiastic teachers. Sixty-four middle school students who took a seven-question quiz averaged 54.4% correct answers. These results suggest modifications, like more robust in-class delivery of lesson objectives and content, an interest approach activity tied to objectives, and reflective discussions after each learning activity. Plans are to use this approach to develop and test the rest of the lessons before statewide diffusion of the curriculum.

079

Finding Balance in Undergraduate Research for Graduate School and Career Preparation in Agricultural Sciences

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Texas A&M University-Kingsville has a successful history of enhancing undergraduate student education through research and experiential learning. Undergraduate (UG) research training and mentoring programs over the past 15 years has focused upon an underserved Hispanic student population. From 2002 to 2011, USDA-NIFA Hispanic Serving Institutions (HSI) funds targeted undergraduate research with faculty serving as research mentors to students. The results of this effort led to a significant increase in the number of students prepared and desirous to enter graduate school. Fifty percent of UGs, regardless of race, continued into M.S. degrees upon completion of a B.S. degree. In 2011-2015, HSI funding focused upon helping UG students with research experiences as summer interns with partners outside of the University system. This effort to maximize internships with mentors in ag-related agencies and industry partners resulted in a loss of faculty-to-student mentoring in research at the University. This shift in focus led to a drop in students willing to consider graduate school as an option as less than 10% of B.S. graduates went onto M.S. degrees. The results of our multi-year efforts at preparing UGs for careers and graduate school emphasize the need for balance in faculty-students research programs and outside mentor-student internship programs. To best prepare UGs for choice between graduate school or a career in agriculture at the time of graduation, strategic student placement in research and internship programs is essential. This presentation will discuss proposed strategies to address these challenges.

082

A Pedagogical Approach for "Wicked Problems"

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Wicked Problems (WPs) are rooted in a combination of cultural, political, and socioeconomic phenomena, which makes them nearly impossible to resolve. Food security is an example. Scholars recognize multiple interconnecting factors that contribute to insecurity including poverty, race, education, and geography. Untrained, inexperienced students tend to offer monocausal explanations and one-dimensional solutions without full awareness, or comprehensive assessment of, the complex dynamics that shape WPs. To develop capacities for evaluation, an undergraduate rural sociology course was used to create a case study designed around a learner-centered, team-based, pedagogy. Following guided training linked to the lecture and readings, students identified and collected "real-word" data, built and manipulated relevant databases, evaluated and synthesized data, constructed and contextualized data-driven arguments, and presented and defended findings in both oral and written formats. The primary objective was to provide a genuine

opportunity to apply key concepts about the structure and operation of the agrifood system, and thus, increase students' mastery of the substantive material. A secondary goal was to offer students with limited or no background in the discipline, training in research methods, and/or experience making empirically-based arguments a framework for exploring and illustrating "wickedness" more broadly. Assessment of this problem-based approach showed that it provided an engaged and empowered learning experience which fostered critical thinking about, and a deeper understanding and appreciation of, food security. In addition, students developed an array of "hard skills" that were well-received by subject area experts, and a variety of "soft skills" that are consistently identified in employability research.

084

Breaking News! Using Current Events and Social Media to Teach Power and Influence

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Educators know the value of active, engaged learning activities in the classroom. However, for busy teachers, developing unique in-class experiences that help students understand and connect the content can be time consuming. Further, we understand the need to make student learning relevant to their daily lives and future careers. In 2012, a USDA-NIFA grant funded the development of a series of curriculum supplements that contextualized leadership theories and concepts in agriculture, specifically the NIFA priority areas. One of the supplements was a social media simulation that challenged students to write a Twitter post utilizing a specific influence tactic with regard to California proposition 37, which would have required labeling of genetically engineered foods. During the semester in which the supplement was integrated into a Foundations of Leadership course, Subway restaurants released their state-

ment regarding the use of antibiotics in food animals and products they serve. The instructor modified the supplement, replacing the California proposition 37 information with information about the timely Subway policy statement. Student pairs (N = 15) were assigned an influence tactic, as well as a view point (supporting or opposing Subway's position). Each team then wrote a tweet that demonstrated how their assigned influence tactic might be employed via social media to persuade readers to join one side or the other. While this activity was utilized to teach influence tactics, it can be further modified to help students articulate their learning of other topics clearly and concisely as a demonstration of their learning.

085

Knowledge Gain and Student Perception of Experiential Learning Activities

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Our objective was to determine the effect of experiential learning activities on students' knowledge gain and perceptions. Research was conducted on four animal science courses (n=233, 61 males and 172 females). Knowledge gain was assessed using pre- and post-tests given before and after experiential learning activities. Student perceptions were evaluated through post-then-pre surveys with responses ranging from 1 (not at all) – 5 (very much) regarding four categories: familiarity, satisfaction, importance of learning and ability to perform. Students completed eight experiential learning activities in conjunction with three classes; each was evaluated as minimal (MIN; n=3), moderate (MOD; n=3), or (COMP; n=2) with regard to the amount of independent action and decision making the student participated in during the experiential learning component. Activities included identifying horse colors, taking animal vital signs, body condition scoring of horses, horse leg wrapping, biomechanics, a dairy breeding simulation, and vaccinating farm animals. All post-test scores increased ($P<0.001$) compared to pre-tests for all three categories of experiential learning. Change scores between pre- and post-tests were evaluated and showed an increase between the MIN, MOD, and COMP activities, with overall scores increasing the most in the MOD and COMP cate-

gories ($P<0.029$). Overall, students reported increased ($P<0.0001$) perceptions of familiarity, satisfaction, importance of learning and ability to perform the experiential learning activity. Findings indicate that students gain knowledge effectively through experiential learning opportunities and perceive those activities to be beneficial to their future careers.

087

Student Motivation and Valuing of Active Learning Strategies in Large Lecture Agricultural Undergraduate Courses

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Motivating students to engage in large undergraduate courses is an ongoing instructional challenge. Active learning strategies promote comprehension and combat lagging engagement; however, the large lecture context may uniquely hinder active learning implementation. The objective of this quantitative study was to explain how differences in student motivations could explain variation in the perceived value of active learning. A convenience sample was conducted within three agricultural leadership or communication courses, with a response rate of 46.5% (n = 181). Researchers conducted a hierarchal multivariate regression, with GPA, percent class attendance, and percent off task technology behaviors identified as potential covariates. These variables were placed in a simultaneous first block. The second block included the motivational constructs of Intrinsic Goal Orientation, Extrinsic Value, Task Value, and Expectations for success each entered simultaneously. For Perceived Value of Active learning strategies, the covariate model was not significant, F = 0.30 (3,160, p > 0.05). The full regression model, including motivational constructs, was significant, F = 13.38 (7,156, p < 0.05) and explained 35% (adjusted R2 = .35) of the variance in perceived value of active learning. Among tested motivational factors, researchers conclude both extrinsic goal orientation (d=0.49) and task value (d=0.18) explained significant (p<0.05) proportions of variation in perceived value of active learning strategies. Researchers recommend instructors facilitate motivation for active learning participation by highlighting the usefulness of content beyond the classroom and

considering the importance of external factors, including grades and peer participation, for active learning success.

088

How to Organize and Deliver an Online Class to Meet Student Learning Expectations?

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Taking classes online is becoming more popular among college students than ever before. Various programs in the college of agriculture deliver classes online to meet this growing demand. Meeting the student demand for online learning in higher education with effective online classes is a challenge educators have to face. There are various options to organize and present an online class with new communication technology. However, educators are still experimenting to meet student learning expectations with advancing communication technology. The purpose of this research was to determine how to organize and deliver an online class to meet students' learning expectations. Three main objectives of the study were to determine: 1) student preferred instructional activities of online classes; 2) the instructional activities helpful for students to learn from online classes; and 3) testing preferences of students for online classes. The purpose and objectives were accomplished by conducting an online descriptive survey research study with a random sample of students in the college of agriculture at North Carolina State University. Findings indicate students prefer to have instructional activities such as reading materials; instructional videos and audios; Power Points with recorded narrative; and hands-on learning activities such as case studies. However, students were less preferred for having a discussion forum as an instructional strategy. We expect to present findings that will help educators to select student preferred instructional strategies for designing effective online classes. This presentation has implications for the instructors who are planning to teach online classes.

090

Cultivating Successful Participation and Outcomes in International Experiences: Students' Evaluation of the Pre-Departure Course for Study Abroad

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The purpose of study abroad programs is to foster personal and academic growth, appreciation for diversity, and global citizenship. However, students are not always provided the necessary resources that help them adjust and accept new cultures. Engaging students in a pre-departure course offers a jump-start to productive interaction and collaboration in a new culture and community. A pre-departure course for a three-week service learning trip to South Africa was evaluated using pre-post course surveys, focus groups, and in-depth interviews. The participant group included diverse students (N =26) from both urban and rural communities who attend a large Midwestern university. The majority were upper-classmen. Preliminary findings on the pre-post surveys, in which students rated themselves using the following scales: Interethnic Communication Apprehension Scale, Intercultural Communication Apprehension Scale, Intercultural Sensitivity Scale, Personal Social Values Scale, Community Service Self-Efficacy Scale, and the Munroe Multicultural Attitude Scale Questionnaire, revealed an increase in positive beliefs and values. Focus group findings suggest that students found the pre-departure course critical to their historical perspectives and cultural/contextual understanding of the community in which they interacted. Likewise, it provided students with the necessary tools to be fully immersed in the new environment. Findings indicate that students increased in all assessments. The results of this study can be used to improve or develop pre-departure courses, which employ innovative and student-friendly methods to bridge cultural differences as well as effectively enhance students' opportunity to learn, approach community immersion with confidence, and apply multi-disciplinary expertise and skills in their destination activities.

091

Strengthening Agripharmatech Program through Pathway Certificates and Partnerships with Hiilaniwai Food Service and Windward Schools

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The Agripharmatech program at Windward Community College (WCC) provides students with knowledge and skills in advanced agribiosciences, preparing them for immediate employment in agriculture, biotechnology, pharmacognosy, as well as further transfer to 4-year institutions majoring in STEM fields. A seamless pathway from Certificate of Competence in Agripharmatech: Plant-Food Production and Technology (CO PFPaT) to Board of Regents-approved Certificate of Achievement in Agripharmatech: Ethnopharmacognosy (CA A-EP), and Plant Biotechnology (CA A-PB) offers students diverse opportunities in career and academic development. New strategies to improve student recruitment, completion rates and expansion of workforce development initiatives are to be implemented through partnerships with Hiilaniwai Food Service Innovation Training (HFSIT) program. CO PFPaT graduates are encouraged to get National certifications in nutrition, and food safety from HFSIT, while HFSIT graduates would take three Agripharmatech classes or their National certifications will be equated with some Agripharmatech elective classes to receive CO PFPaT certificates. These joint credit/non-credit certifications have greater value in competitive job markets. Off-campus partnerships are being built with Kailua High School to offer dual-credit botany classes on their campus, allowing students to receive CO PFPaT while in high school. Hands-on demonstrations in advanced agribiosciences are offered to neighboring intermediate and high school students through school and college fairs. Survey data gathered at recent events shows that 87% of student attendees indicated interest and would consider taking advanced agribiosciences at WCC. These partnerships should produce highly-skilled workers ready to enter the workforce and pursue degrees in STEM-plant science fields.

096

Student Definition and Perception of Sustainable Agriculture

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Sustainable agriculture is becoming more prevalent in today's society as the population delves into a technologically advanced age. Classes that promote the teachings of sustainable practices in agriculture are becoming more common in institutions of higher education. Sam Houston State University has implemented coursework and degree plans that not only focus on this topic, but give students an opportunity to immerse themselves in to the subject. Eighteen graduate students enrolled in a Sustainable Agriculture and Food Environment (SAFE) course in the fall of 2015 completed a pre/post-free response survey, polling their knowledge and perceptions of sustainable agriculture. Qualitative analysis using NVivoTM verified 38% of the students shifted their belief from no or not sure to yes when asked if there was a distinct difference between sustainable agriculture and organic agriculture. When asked if sustainable agriculture production is a regional or global concept and management practice, 33% of the respondents modified their opinion from regional to global upon completion of the course. Most notably, there was a change from 72% to 100% of the students who believed that sustainable agriculture practices will be a long-term production strategy. Students exposed to trending management concepts through their coursework are more likely to displace their preconceived traditional notions of agriculture and sustainable practices, in favor of more accurate and descriptive definitions and philosophies. This considered, more research further examining the opinions of students exposed to these SAFE courses could help further explain the need for future course development.

097

Exploring Integration of Research into Teaching at National Agrarian University La Molina, Peru

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Three strategies that have been implemented in the last six years in order to improve education offered at National Agrarian University La Molina are presented and discussed. The strategies were designed to integrate discipline-specific research into teaching, as part of a broader collaborative project (Innovation of Education) funded by the Flemish Consortium of universities. The strategies implemented were: A. Identification, analysis and dissemination of good cases of research/teaching integration which were already occurring in different colleges. A listing of such courses was prepared and distributed widely via print and internet. Introductory training activities were also distributed as part of the strategy. B. Educational Projects (lasting one or two semesters each) were developed by course supervisors. They were presented for support and funding in response to open calls at the university which emphasized the integration of research into teaching at course level. Fourteen of these projects have already finalized their activities; C. Discussions among professors about the theory and practice of integration of research into teaching in the framework of a broader open community of learning initiative. This activity involved 6 to 9 professors of different colleges meeting weekly during a semester and was facilitated by an educational professional. Four of these groups have already finalized their activities. Good complementarity has been observed among these three strategies. Strengths and weaknesses of each strategy will be discussed in view of exploring synergies and identifying new strategies.

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Promoting Faculty Teaching Excellence and Supporting Student Learning in Colleges of Agriculture

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The most important responsibility of post-secondary institutions of learning has been to meet the educational needs of the student. Land-grant universities are concerned with increasing academic rigor to stimulate student learning and engagement, and to escalate teaching within colleges of agriculture to meet the changing demands of the workforce. To provide resources for professional development for teaching faculty, the researchers

explored how teaching excellence has been promoted and how student learning has been supported in post-secondary education. This research sought to determine the structure and effectiveness of professional development programs used in Colleges of Agriculture, throughout the nation, to promote excellence in teaching for faculty and support student learning. Survey research was utilized to obtain information from associate deans of agriculture colleges at land-grant universities and NARRU colleges across the nation. Data was collected using a researcher-developed instrument that was reviewed by a panel of experts at the Association of Public Land-grant Universities (APLU) and pilot tested with associate deans at Clemson University. Majority (98%) of respondents indicated a definite importance to provide opportunities to enhance teaching and improve student learning utilizing three or more, one to three hour programs per year. Moderate faculty participation, with no financial rewards, were reported. Associate deans considered programs very effective to promote teaching excellence and student learning, and improve instructional effectiveness. Recommendations include consideration of these findings to assist in the development of an effective teaching and learning program that can promote faculty teaching excellence and support student learning in Colleges of Agriculture.

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Using Video as a Teaching Aid to Help Students Evaluate Themselves in Equitation Classes

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Effective instructors seek to improve teaching techniques to help increase confidence and develop talents in students. Video recording is a means of helping students view and evaluate themselves. This study was conducted to assess the personal and educational impact of using video to record equitation students enrolled in Intermediate Horsemanship classes at Southern Utah University. Students were recorded riding at the beginning and end of each semester at various gaits. Both videos were viewed and evaluated as a class. A Likert-type survey was developed and voluntarily taken at the end of each of nine consecutive semesters (Fall 2011-15).

Eighty-four students completed the survey. Over 97% agreed the class had been valuable. Ninety-three percent reported they ride with improved balance and timing and give more consistent cues. Ninety-four percent reported it was beneficial to see themselves ride at the beginning and end of the semester and 87% felt it was helpful to discuss the video. Only 37% felt it would help to watch the videos more than once as a group. Most students (79%) also felt that watching and evaluating other riders was valuable. When asked if viewing themselves and others increased awareness of their own horse training ability, 86% reported that it did. Videoing is a considerable commitment requiring multiple class periods to record and watch, as well as knowledge of the equipment and software. However, student response has made it evident that using video to evaluate performance is a valuable educational experience for equestrian students at Southern Utah University.

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Influences on Students Choosing Majors in Agriculture

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Structural equation modeling (SEM) analysis was used to examine independent variable constructs of student characteristics, environment, learning experiences, and task approach skills from Krumboltz's social learning theory of career decision making on the decision of students to choose an undergraduate major in agriculture. Variables were identified through previous research in field of study choice in agriculture and data was evaluated from the NCES Education Longitudinal Study beginning in 2002. Using Exploratory Factor Analysis, the students' characteristics of gender and race/ethnicity did not fit in a pattern, however, students' GPA did load under a new students' goals construct. Learning experiences and students' goals were similar to Krumboltz's constructs of learning experiences and task approach skills, but the environment construct was divided in the study model into three constructs of parents' goals, parents' education, and influential people. The final SEM model fit adapted from the

Confirmatory Factor Analysis met the recommendations of a good fit with a Chi-square of 2.09, a RMSEA of 0.05, and a PCLOSE of 0.35. The influence of parents was evident, for example parents' goals having the highest item total correlations (r = 0.46 and 0.50), yet less than one percent of parents indicated they had an occupation in agriculture. With the small percentage of parents directly employed in agriculture and the significant amount of influence parents have on field of study choice, coordinators of recruitment and awareness programs are encouraged to include parental involvement in their practices and learning experiences.

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Establishing Teaching Efficacy through a Books for Agricultural Education Reading Program

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Across the nation, only 36% of four-year college students are able to read lengthy, complex texts, synthesize them, and make inferences. Book clubs can encourage literary engagement, providing students with an opportunity to engage in conversations about salient theories and practices. This study sought to evaluate the impact of the Essays for Education Program, an APLU-funded endeavor that provided books related to teaching practices to agricultural education students during academic breaks. Students at [two universities] participated in the winter 2015 book club; Turn around Tools for the Teenage Brain was selected as the book of focus. Students (n = 23) were surveyed both pre- and post-intervention about their teaching self-efficacy. Data were analyzed and showed that students gained in self-efficacy especially in the constructs of student engagement (Mpre = 6.85, Mpost = 7.86), instructional strategies (Mpre = 7.26, Mpost = 7.95), and classroom management (Mpre = 7.17, Mpost = 7.85). However, over half (n = 13) of the participants were unable to finish reading the book during the winter break. Respondents indicated barriers to reading included home-related responsibilities, family events, and busy schedules. Researchers learned while the reading and subsequent reflection was valuable to preservice teachers, students experienced many barriers that prevented them from reading. Researchers recommend matching pre-service agriculture teachers who are at a similar level of experience to foster productive levels of networks. Also, future book selections should consider books on agricultural topics to boost awareness of agricultural issues.

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The Importance of Agricultural Mechanics Skills Training: Implications for Post-Secondary Education

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Agricultural mechanics education serves the purpose of developing necessary mechanical abilities used in agriculture. Technology used in agricultural mechanics is constantly evolving, leading to a need for continual evaluation of secondary level course content. The conceptual framework guiding this study is based on the work secondary agriculture teachers do with industry leaders to prepare students with the employability skills that industry desires. Based on agriculture teachers' cooperation with industry, they have insight into what is important to teach, and what will be important to teach in the future. The first objective of this study was to determine what depth agricultural mechanics skills are currently being taught at the secondary level. The second objective was to determine the level of importance secondary teachers perceive those same skills to have in the future. This quantitative study used a population of secondary agriculture teachers in Iowa active during the spring of 2016. The researcher modified instrument asked respondents to rate 102 agricultural mechanics skills based on the current depth each skill is taught and how important they perceive those skills to be in the future. The results indicated that the teachers perceived the future importance of all 102 skills to be higher than the current importance they place on those skills. Most notably, the skills related to safety had the highest mean scores. This led the researchers to believe the overall importance of agricultural mechanics' education will increase over time, particularly in safety, which should be reflected in post-secondary teacher education training.

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Comparison of Teacher Competence in Agricultural Mechanics Among Traditionally and Alternatively Certified Agricultural Education Teachers

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One ongoing problem in agricultural education is the shortage of qualified teachers to fill vacant teaching positions. With a lack of qualified candidates, school administrators have hired uncertified teachers to fill the positions. Prior research has shown differences between alternatively and traditionally certified agricultural education teachers regarding competence in teaching agricultural concepts. Bandura's theory of teacher efficacy guided this study. Teacher efficacy has been shown to positively increase motivation and levels of achievement in students when the teacher exudes a high level of efficacy. The purpose of this study was to determine Iowa secondary agricultural education teachers' perceived levels of efficacy related to teaching agricultural mechanics skills for traditionally and alternatively certified teachers. Secondary instructors at the Iowa Association of Agricultural Educators' summer conference were given a paper-based survey instrument that measured their self-perceived competency in the five agricultural mechanics skill area constructs. Both the traditionally certified and alternatively certified teachers' perceived themselves most competent to teach the structures/construction construct. However, it should be noted that both traditionally and alternatively certified teachers were considered to be moderately competent in all five agricultural mechanic constructs. As teacher self-efficacy has been shown to positively increase teachers' motivation, it is important that additional in-service training for both groups should be developed and delivered in all five construct areas.

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Curriculum for a Career Designed Internship

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The career designed internship experience begins with the freshman seminar. All departments are required to enroll students in a freshman seminar as part of the university Transitions and First Year Experience. At this time student are introduced to the three faculty that will see them through their internship experience. During seminar the internship experience and curriculum is introduced. Students work with faculty to design a degree program in an Agricultural Communication, Agri-Industries/Agencies or Horticulture to fit their career goals. The next connection is the junior seminar, where students are encouraged to start networking for internship experiences through career fairs, trade shows and industry visits to campus. At this juncture student are encouraged to focus on career goals and contacts developed and visit often with the faculty directing the internships. The last on campus experience is the five-week capstone courses, which include a leadership, a methods and seminar course focusing on the Applied Learning Experience critical reflection. Upon completion of the five week courses students are required to complete a ten-week full-time internship, prior to graduation that completes the semester. The internship is a faculty driven, hands-on approach with the internship supervisor and student engaged in a true applied learning experience. These ten weeks involves weekly reports from the internship supervisor, a minimum of one site visit from university faculty, zoom conferences with students, journal reflection pieces and completion of a critical reflection piece. This approach has netted 40 plus percent of these students being employed or accepted in graduate school upon completion of the career designed internship.

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Using Concept Map Activities to Show an Increase of Student Knowledge

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Concept maps, or a pictorial representation of a complex concept, are a pedagogical activity instructors can use to analyze how students link course material together. As learning occurs, concept becomes more elaborate and complex. The objective of this research project was to utilize an innovative teaching methodology to measure change in student knowledge before and after an agricultural leadership ethics course. During the first week of class, students were broken into groups and asked to create a concept map using the word "ethics" as the center node. This pre-concept map was collected and saved by the instructors. On the last day of class, the activity was repeated, creating the post-concept map. Results of this activity showed an increase in knowledge from a quantitative and qualitative measurement. Quantitatively, students increased their number of quality nodes as well as increased their ability to see the connectivity between these nodes. In the pre-concept map, students used colloquial terms (i.e.: integrity, honesty, doing what's right) in their nodes. In the post-concept map, students used ethical theories (egoism, altruism, social contract theory) to define the term showing a qualitative increase in knowledge. Students were given their pre-concept map to place next to their post-concept map and asked to analyze the difference and growth in learning from the first week of class to the last. Without knowing the formalized evaluation criteria, students were able to visually evaluate their increase in knowledge.

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Perceived Gap Between Importance and Competence of Leadership Characteristics Among Undergraduate Leadership Students

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Colleges of Agriculture have been charged with developing the next generation of employees, employers, and leaders for the industry of agriculture. To fulfill this charge, educators in these colleges must be aware of the perceived needs and abilities of their students in the area of leadership. A population of four cohorts (*N*=71*)* of students enrolled in a year-long leadership academy at [University] were assessed using the Leadership

Needs Assessment tool (Velez, McKim, and Simonsen, 2013). Means were calculated for 13 leadership constructs to determine the range of importance and competence held by the students. The leadership construct of *Ethical Behavior* (*M*=5.66) was deemed *Extremely Important* by the students. All 12 other constructs were found to be *Very Important*. Data revealed the students felt *Very Competent* in four of the constructs (*Ethical Behavior*, *M*=5.08; *Valuing Diversity*, *M*=4.61; *Sustaining Leadership*, *M*=4.61; and *Developing Teams, M*=4.54) and *Moderately Competent* in nine. To determine perceived needs, mean weighted discrepancy scores (MWDS) were calculated. These were calculated by determining the discrepancy between the students' perceived competence and importance within each leadership construct using the Borich Model (Borich, 1980). Based upon the calculated MWDS scores, *Managing Conflict* (MWDS= 6.28), *Understanding Community* (MWDS=5.61), and *Commitment to Serve* (MWDS= 5.29) yielded the greatest perceived educational need by the students. Leadership constructs that generated the lowest perceived need were *Understanding Leadership* (MWDS=3.09) and *Ethical Behavior* (MWDS=3.30). Given the perceived leadership needs and strengths, instructors can begin attempting to link curricular experiences to specific leadership skill acquisition.

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Cultivating Advocacy Skills and Content Knowledge: An Evaluation of a Course Project

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As the general public becomes increasingly removed from production agriculture, it is important that undergraduate students in Colleges of Agriculture are prepared to serve as positive voices for agriculture and can articulate accurate and scientifically based information to a variety of audiences. As a result, an advocacy assignment was created for students in a senior level Beef Management course. In an effort to learn more about students' experiences, gain valuable feedback for the continuation of this assignment and the potential development of similar assignments in other courses, students' written reflections were analyzed. Students noted the visitors' lack

of knowledge and limited experience with agriculture. Additionally, students mentioned concerns about misconceptions of the beef industry among visitors. Prior to the advocacy experience, several students reported being apprehensive about interacting with the public due to their limited experience in the beef industry. However, students found they were well- prepared through course material and at ease when discussing the beef industry with the public. Students were surprised at the questions asked, as they did not perceive them as very "meaningful." In addition, they felt more confident in their ability to communicate with adults rather than children related to the beef industry. Some recommendations to be considered in future industry advocacy assignments were to assist students in message development for different age groups, providing guidelines and suggestions for interacting with the general public, and in addressing and mitigating negative comments or misconceptions.

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Student-Centered Teaching with Problem Based Learning

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Approximately 40% of total US energy was consumed in residential and commercial buildings in the past 10 years. In response to the increasing concern over the sustainability of building energy requirements, a new course, Environmental Control and HVAC Systems, was developed and offered to Technical System Management students at the University of Illinois in Fall of 2008. The effectiveness of this class was based on student-centered teaching and problem-based learning. In student-centered teaching, more effort was taken to know the students and to remember the students' names so that when they were called on in the classroom, they felt more engaged. When they were more engaged, they showed more interest in the class and became more involved in class discussions. As a result, the students were more willing to attend the class. In problem-based learning, class started with a "question of the day" around which concepts and lecture materials were presented. Students were then asked to work as a group to develop a solution to the problem based on what they had learned. The class then concluded with a micro-

quiz to assess the learning outcomes. The success of these two approaches to learning has been evaluated in different ways. The mean score for micro-quizzes was 13 of 15. The overall semester's attendance was above 90%. The overall quality of this course as rated by the students was 4.3 of 5. Finally, the enrollment has almost quadrupled from 12 in 2008 to 43 in 2014.

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Agricultural Education Pre-service Teachers' Perceived Competence in an Advanced Agricultural Mechanics Course

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Agricultural education pre-service teacher candidates are asked to teach a variety of technical content within agricultural education. Agricultural mechanics is composed of different content specific topic areas, such as welding, small engines, plumbing, and more. The current study sought to determine pre-service teacher candidates' perceived level of competence in agricultural mechanics. The objective was to determine the change in self-perceived competence in twelve instructional areas of agricultural mechanics from the beginning until the end of the course. Eleven students enrolled in the advanced-level agricultural mechanics course during the Fall 2015 semester at the Pennsylvania State University all completed the survey. Following approval of the IRB, students completed the 58 item Likert-type survey on the first day and last day of the class. A 10-point Likert scale, from 1 = Not Competent to 10 = Very Competent, was utilized to collect data. Data were entered into Excel® and means were calculated for each of the competency areas. Overall competency levels in each of the competency areas increased from pretest to posttest. The lowest level of initial competency was cold metal work (M=2.98), followed by oxy-fuel cutting and welding (M=4.60). Plumbing had the largest mean increase from the beginning of the course to the end of the course (M=2.87) with cold metal work having the second largest increase (M=2.86). Teacher education faculty members should examine the lowest areas of perceived growth, as well as the lowest post-test means, and structure opportunities for growth

through student teaching, individual work, and professional development.

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Are We Focusing on the Right Things? Perceptions of Recent Graduates

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Post-secondary education in agriculture has a distinct responsibility to prepare graduates that possess the skills and knowledge for their position, but also have the confidence in their own capacity for success. Social Cognitive Theory would purport that belief in ones on ability to be successful would impact the actual ability to be successful. In addition, Hygiene theory would posit that value put on the task (i.e. how important is this); impacts desire to put forth effort to be successful. The Workforce Education and Agricultural Extension Education programs at The Pennsylvania State University worked together to survey graduates from the previous five years of their teacher preparation programs to determine their perceptions of importance and their perceptions of their preparedness on discipline specific items. A census was conducted with a frame of 78 graduates with a response rate of 74%. Early respondents were compared to late respondents to control for non-response error. Mean Weighted Discrepancy Scores to indicate the difference in graduates' perceived preparation and importance on items were calculated and analyzed. Preliminary findings indicate opportunity for improvement in the areas of Classroom Environment, Assessment, and Support Diverse Learners. The study was meant to serve as a program improvement tool with the belief that improving perception on preparedness in areas deemed most important by recent graduates would improve self-efficacy; thus, resilience and retention in the profession. Process to evaluating graduate satisfaction could be replicated in a variety of disciplines to provide feedback from the specific stakeholder group of graduates to academic programs.

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Homeschooled Students' Access to Participate in School-Based Agricultural Education Programs

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Homeschool enrollment is steadily growing, and this population is a potential audience for university K-12 outreach, precollege, and recruitment programs. Colleges of agriculture can broaden their reach and provide access to this target population by recruiting high quality students and produce a skilled workforce to address global agricultural challenges. Traditionally, colleges of agriculture have recruited high school students enrolled in school-based Agricultural Education programs and the National FFA Organization. Homeschool students are a potential growth market as colleges of agriculture focus on more effective engagement and recruitment of high school students, and school-based Agricultural Education and FFA consider ways to increase their enrollment. However, limited research has been conducted to identify and summarize state's education policies regarding homeschool enrollment in public schools, Agricultural Education courses, and FFA. This study analyzed the potential of homeschool student participation in secondary agriculture programs, specifically school-based Agricultural Education and FFA for each of the 50 states. A qualitative policy analysis utilizing evaluation coding was used describe the potential of homeschool student participation based on each state's education policy regarding part-time public school attendance statutes, homeschooling regulations, and FFA membership requirements as stated in the state FFA constitution. Currently, two states (i.e., North Carolina and Alaska) have defined homeschool FFA membership policies, while other states (e.g., Indiana and Minnesota) allow for homeschool student participation in FFA under the part-time public school attendance provision. Strategies for increasing homeschool student awareness of Agricultural Education programs as well as potential pathways for program participation will be discussed.

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Creating Learning Outcomes and Rubrics for Education Abroad

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Anecdotal evidence of intercultural learning through education abroad is prevalent, but is rarely measured as part of a program's academic learning outcomes. Often American Public Land-grant Universities, as well as University or College administration have developed learning outcomes for international experiences; however, incorporating those outcomes into a specific major or academic program can seem nearly impossible. The College of Food, Agricultural, Environmental Sciences and the Department of Animal Sciences at The Ohio State University partnered to synthesize both the College's education abroad and departmental program's learning outcomes. These new learning outcomes were incorporated into syllabi for five education-abroad courses to focus and measure intercultural learning while abroad. Specially designed assignments and rubrics were created and utilized from December 2015- February 2016 during three education-abroad programs. The Cultural Quotient Indicator developed by Livermore and Ang was used to determine the reliability of the student rubric performance and as an additional source to measure gains. Prior to program participation, students involved in the study showed a higher than worldwide average drive and strategies for intercultural experiences, but scored lower than the worldwide average on both the knowledge and actions taken regarding intercultural experiences. T2 results indicate an increase in all four factors, now rating higher than the national average in each. The objective of this session is to share lessons learned and the outcomes of the newly designed assignments and rubrics.

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The Effects of an Introductory Agriculture Curriculum on Student Knowledge and Perceptions of Agriculture

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Due to a variety of reasons, society is further removed from agriculture. As a result, much of society is unaware of common agricultural knowledge and agriculture's significance within society. Agricultural illiteracy can lead to an inability to differentiate between true agricultural facts and popular fallacies. One way to alleviate the lack of agricultural literacy is to introduce systematic agricultural curriculums to certain population groups. The purpose of this study was to quantitatively and qualitatively investigate the level of agricultural knowledge among three groups of private school students and assess their perceptions of agriculture. This study was a mixed-method, quasi-experimental design using pre and post-tests, descriptive statistics, a non-randomized control group, accompanied with focus groups to investigate the research questions. The research questions were: What is the current level of agricultural knowledge among 10th grade biology students? Was there a significant increase in agricultural knowledge of agriculture after treatment? What were student perceptions of agriculture before and after treatment? The findings revealed there was low knowledge of agriculture among all three groups (M = 42.61, SD = 16.52) of students (N = 57) and treatment groups contained a stereotypical view of agriculture. The findings show there were significant differences in knowledge gain between the control and treatment groups (p < 0.001). Furthermore, focus groups revealed that after treatment, students possessed a deeper appreciation and conceptualization of agriculture. The findings indicate that an introductory agricultural curriculum can increase knowledge and change perceptions toward agriculture.

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Teaching Tools for Agricultural Literacy and Science-Informed Decision-Making

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Making sense of science and making it relevant to everyday decision-making is a key component of agricultural literacy. However, many students lack a fundamental understanding of the underlying scientific foundations related to agriculture or natural resource issues, and have difficulty applying science to engage effectively in related decision-making. To confront this need, we developed a unique model course with learning objectives focused on 1) science-informed decision-making and 2) media literacy that is required for all STEM and non-STEM majors in the College of Agriculture and Natural Resources (~600 students per year). Our objective is to describe the innovative teaching approaches that we have developed that may be of wide interest and applicability across a post-secondary curriculum. Students practice making science-informed decisions in the context of complex socio-scientific issues such as water use conservation, biofuels, biodiversity and habitat loss, and food production. The course uses active-learning techniques and peer-learning groups to stimulate learning. Students' assessments include: 1) evaluating claims and evidence in popular media and peer-reviewed journal articles, 2) seeking and applying relevant scientific information, and 3) making an argument about an issue using a series of six decision-making steps. The last one-third of the semester is devoted to the students' final group research project where they make a recommendation about the best course of action on an issue of their choice during a campus-wide poster session. The teaching tools that we've developed are based on science education research and our own design-based research within the class.

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Outcomes and Experiences of Students Participating in an International Horsemanship Program

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Sam Houston State University has participated in a competitive grant writing process over the past four years in an effort to implement an international horsemanship program for the American Quarter Horse Association. The program fosters an environment in which people around the world can increase their horsemanship skills. Undergraduate and graduate students participated in developing and conducting horsemanship camps for international stakeholders throughout the European Union and Oceania over the past four summers. These horsemanship clinics were designed to enhance the skill sets of the camp clientele; however, the student instructors also gained valuable knowledge and skills through the experience. These interactive clinics provided students with the opportunity to actively engage in the teaching process. Sixteen student instructors that participated in this program were asked to describe the top five skills that they have gained while being an international student instructor. Researchers identified five common themes throughout the student responses which were: (a) learning to teach more effectively, (b) incorporating alternative methods in order to teach a lesson, (c) working collectively as a team of student instructors from varying backgrounds, (d) learning patience while presenting information through the assistance of a translator, and (e) cultural immersion by integrating into a foreign community. This program proved to be valuable not only to those seeking to improve their horsemanship skills, but also to the student instructors who developed personal skills while also learning to adapt to various cultures and learning styles.

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Some Observations Relative to Entering First Year Students Majoring in Animal Science

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Lesson content, format, and method of delivery need to be suitably structured to maximize learning. Thus, it is important that university instructors have an appreciation for the general make-up of the students in the various courses in order for lessons to be delivered effectively. At the University of Tennessee, like the situation nationwide, females are enrolling in agriculture and animal science in particular, at higher numbers than male. However, the depth of knowledge of agriculture for incoming students is uncertain. The objective of this study was to track the gender make-up of entering first year animal science majors and to investigate their preferred animal species course of studies (e.g., food animals, companion animals). The study also evaluated students' depth of knowledge relative to certain production practices. Over a 12-year span, students periodically completed a questionnaire at the first session of the Introduction of Animal Science course in the fall semester and again at the last class of the same semester. The questionnaire asked students to 1) select their preference from a list of 10 animal species and 2) respond to 10 animal production items about their knowledge of production agriculture. The data indicated a consistent increase in class size, with females outnumbering males. There was also a high preference for non-food animal agriculture. However, animal production agriculture related knowledge was deficient at the beginning of each semester but increased over the course of the semester.

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Assessment of Strengths-Based Leadership Domains and their Impact on Student Academic Success

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To explore talent awareness and strengths development as influencers of student success, researchers investigated academic performance among students enrolled in a food science diversity course. For students completing the StrengthsFinder assessment (n=175), number of official major changes (MAJΔ) and number of semesters with term GPA<2.0 were obtained. These data and students' top 5 talents were matched with exam performance. Students' top talents were categorized in 4 domains (executing, influencing, relationship building [RB], and strategic thinking [ST]) and student dominant domains (≥3 talents in a domain, n=101) were identified. Within executing and ST domains, MAJΔ differed based on number of talents. More executing talents (4) had less MAJΔ than those with 0 executing talents. Conversely, those with more ST talents (4) had more frequently MAJΔ than those with fewer ST talents. Considering number of semester GPA<2.0, those with more talents in executing (3-4) had less GPA challenges than those with 0; those with more ST had more GPA issues than those with fewer. A correlation (r=0.44) exists between MAJΔ and semester GPA<2.0. Percentage points earned on matching, multiple choice, extra credit (EC) and total points differed (P<0.1) by dominant domain. Executing or ST dominant domains outperformed and completed more EC compared to those in the influencing and RB domains. Increasing executing talents resulted in more EC (r=0.23); increasing influencing and RB strengths earned less EC (r=-0.16 and -0.13, respectively). Results indicate innate talents impact student performance and ability to maintain progress in an academic program, suggesting implications for student retention interventions.

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Teaching-Mentoring Experiences of Faculty in a College of Agriculture and Life Sciences

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Policies regarding formal mentoring of faculty regarding teaching vary among the departments of the College of Agricultural and Life Sciences (CALS) at the University of Florida. As positive

peer-mentoring is thought to enhance teaching, the aim of the study was to explore the teaching-mentoring experiences of faculty in CALS. In August 2015, pre-tenured, non-tenured (≤8 years employed), and recently tenured faculty (2014-2015) were invited to participate via the CALS faculty listserv, and a survey was administered through Qualtrics®. Appointments of respondents (n=57) averaged 44±35% teaching, with 87% having formal classroom teaching assignments. For those respondents who had a mentoring committee (51%), 52% had the committee assigned by the chair/unit leader. Although 74% of respondents did not have a specific mentor assigned to advise them on teaching, 54% had a teaching mentor. Experiences with teaching mentors were positive, even with perceived differences in working styles, attitudes, and philosophies. When asked, "To what extent did you need assistance during your first year of teaching?", many respondents indicated that they sometimes or often needed assistance with mentoring graduate students, managing personal stress, teaching effectively, and using educational technology. When asked, "To what extent were you satisfied with the assistance provided by your teaching mentor?", the majority of respondents were very satisfied. New faculty have varied needs that can be successfully met though teaching-mentoring; however, many new faculty did not have a formal or informal teaching mentor. Teaching, particularly in the first year, is often challenging but may be enhanced through increased teaching mentorship.

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Enhancement of Student Engagement and Interaction in Online Courses through Implementation of a Scholar-ignite Program

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According to the recent Babson Survey on Online Education, approximately 70.8% of academic leaders' report that online learning is critical to their institution's long-term strategy. However, leaders are concerned with student retention in online classes noting retention rates in face-to-face classes tend to be higher than in online courses. Online courses have been criticized for

their inability to promote development of communication skills through active learning exercises. One factor that helps improve both retention and development of critical communication skills in courses is building a sense of community in a class but this is challenging in online courses. We developed an assignment modeled after society Scholar-ignite programs for two online courses offered at the University of Florida. Each student acts as the instructor and develops a single slide, 3-minute presentation on a course related topic. Their classmates are required to ask a minimum of one question to each student presenter. The benefits of this assignment are increased student conversations, increased peer-to-peer learning, and challenging the student to learn more on a subject of their choice in order to share with their classmates. The challenges were developing several how to videos and scheduling the ignite assignments in the learning management system. Results support continued use of a Scholar-ignite program in online courses to aid in the sense of community and to improve student engagement.

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Team Cohesiveness and Its Influence on Student Performance in Team-Based Learning

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Surveys of agribusiness employers consistently report teamwork as a key characteristic sought in new employees. Though teamwork skills can be developed in multiple venues, Team-Based Learning (TBL) is a pedagogical method encouraging structured collaboration among students. Through observation, it appears that team cohesiveness increases over time. If true, does team cohesiveness improve team performance? For this study, we defined team cohesiveness as improvement in the average team peer evaluation score between a formative evaluation conducted mid-semester and a summative assessment administered at semester's end. Multiple linear regression was used to analyze the influence of mean and standard deviation (STDEV) of student GPAs used to form teams, formative evaluations, and the difference between formative and sum-

mative evaluations, on team performance. Analysis of preliminary data showed that the mean of student GPAs used to form teams has significant impact on team performance (p<0.0001). However, the STDEV of student GPAs was non-significant. The mean formative evaluation score is positively and significantly associated with team score (p=0.0067), while a higher STDEV of the formative evaluation had a negative impact on team scores (p=0.0163). An increase in the summative evaluation compared to the formative (i.e., team cohesiveness) significantly influenced team score (p=0.0169), yet the change in STDEV was non-significant. A one-point increase in the mean summative over the mean formative evaluation score increased team performance grades by 3.3%. This shows that team cohesiveness, measured by an increase in peer evaluations over the course of the semester, increased team performance.

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Integrating Applied Learning Experiences into an Agricultural Communication Program

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The "Keeping it R.E.A.L: Real-world Experiences Applied to Learning" program was developed by Tarleton State University in the fall of 2010 to address the Southern Association of Colleges and Schools Commission on Colleges (SACS-COC) requirement to develop a Quality Enhancement Plan. The "Keeping it R.E.A.L." program engages students in one of five applied learning experience (ALE) areas: Internship, Leadership, Service Learning, Study Abroad, and Undergraduate Research/Creative Activities. Students who complete three or more ALEs in two or more categories receive ALE recognition at graduation. Numerous studies have shown that students involved in applied learning experiences are generally more engaged and have greater knowledge gain compared to students who did not participate in applied learning experiences. Since Agriculture as a discipline is fundamentally based on applied learning, integrating ALEs into the programs within the College of Agricultural and Environmental Sciences was a logical step in building the "Keeping it R.E.A.L." program. Beginning in fall

2012, the Agricultural Communication program started integrating ALEs into courses to provide students with applied learning experiences to strengthen their understanding of key concepts and increase student engagement. Since 2012, twenty-seven Agricultural Communication students have participated in one or more ALEs. Internship supervisor feedback has been positive and Tarleton Agricultural Communication students are graduating with real-world experience. As of fall 2015, students enrolled in Electronic Field Production, Agricultural Publications, and Internship receive ALE credit and are required to complete a written reflection of the experience, produce a tangible artifact, and develop an e-Portfolio to showcase the experience.

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Mentoring the Mentor: Supporting Mentor Outcomes in an Innovative College Student Peer Mentoring Program

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Across the United States, more than 75% of universities have peer mentoring programs that aim to promote cognitive, affective, and psychosocial gains in students. These programs are an opportunity for low-cost, high impact student development, and have been shown to play a critical role in student retention. Research has shown that the benefits of mentoring are not bestowed solely on the protégé. Despite this, the majority of peer mentoring programs are designed to largely, or exclusively, support protégé outcomes. At The Ohio State University, a peer mentoring program has operated for four years under a mentor-centric program plan that specifically focuses on supporting mentor development as a primary outcome of the intervention. The College of Food, Agricultural, and Environmental Sciences Peer Mentoring program will be explored as an alternative to traditional mentoring paradigms. In this group mentoring model, mentors work with 5-10 traditional new first year students in a freshmen orientation class over a seven-week academic session. The program structure combines intentionally designed trainings, graduate assistant support and coaching, as well as opportunities for applied and reflective learning for mentors. It is anticipated that mentors will be better prepared to

meet the needs of their employers as a result of this program structure. Mentors develop marketable soft skills through the hands on application of leadership theory and mentoring best practices. Peer mentoring programs that support the needs of the mentor represent an accessible opportunity for student development for both mentors and protégés in colleges of agriculture and related sciences.

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Cultivating Faculty Success Through the Peer Review of Teaching

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Peer review of teaching, when combined with student evaluations, provide a well-rounded picture of teaching quality and provide suggestions for improvement. However, assessment strategies are often inconsistent within a department and across college disciplines, thereby resulting in different assessment data captured and varying depths of feedback. This makes it difficult for a department head to compare reports of a faculty member over time, but it also proves problematic at the college level when reviewing promotion and tenure packages of teaching faculty from different disciplines. Since 2012, the Department of Horticultural Sciences has piloted a standardized method of peer review of teaching. Following a review of research articles on effective teaching strategies, an assessment tool was created that addressed 12 key components of exemplary teaching practices. The tool was designed so the reviewer could easily document observed teaching strategies during the classroom visit(s). A standardized procedure was created for all faculty to follow that dictated frequency of visits, review of course materials, and a follow-up meeting between the faculty member and reviewer. This peer evaluation method has largely been successful in terms of obtaining formative, consistent assessment data as well as facilitating constructive peer and Department Head discussions about effective teaching practices. This presentation will provide detailed information about the assessment tool; the strengths and weaknesses of the tool and process; as well as opportunities and challenges experienced. Participants will not only learn about the assessment tool and procedure,

but will have an opportunity to test it themselves during the session.

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FFA, Why Are We here? The Hispanic/Latino Perspective

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The words "FFA, why are we here" is often heard at the beginning of the opening ceremonies by presidents of this agricultural education student organization around the world. In 2006, the National FFA hosted a forum on "Engaging the Hispanic Community in Traditional White Ag Ed Programs," in an attempt to document relevant information to provide resources for the Latino students. Since 2006, there is little documented evidence of success in engaging Latino students to pursue agricultural teacher education as a viable career path. If agriculture education is to attract a more diverse audience, it is imperative for the voices of the underserved be heard from the first person's perspective. This phenomenological study sought to determine how Latino students from a Hispanic Serving Institution (HSI) perceive teacher education careers in agriculture as a viable option and to document their cultural ideologies of their perceptions of agriculture through their lived experiences. Four (4) Latino students who are currently student teaching participated in the interview process. Each student was provided with a list of open ended questions to document their "lived experiences" prior to and within their agricultural teacher preparation program. Narrative analysis revealed common themes with racial awareness perceptions, equitable treatment, school choice, family, and their innate motivation to make a difference within their communities (culture). One major implications found that would enhance teacher education programs would include experiencing "immersion" in communities of color.

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Learning to Write Like a Scientist: A Writing-Intensive Course in a Microbiology Field

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Few graduates in bio-, agricultural, and natural resource sciences entering graduate/professional programs have had formal instruction or exposure to the discipline-specific genres of practicing scientists and science writers. As communicating science to the public and to other scientists becomes increasingly important, this gap in training is concerning. Drawing on research from Writing in the Disciplines and Rhetorical Genre Studies, our Writing Intensive course in microbiology at OSU focused on writing in the sciences, including instruction in three genres: the grant proposal, the case report, and the research proposal. We conducted a two-part survey in Spring 2015 to gauge students' previous writing experience with these genres and to assess learning outcomes at the end of the course. Most students in the course (n=34) were upperclassman, consisting of 5 sophomores, 16 juniors, and 13 seniors. In the pre-test survey, many students reported having had "no specific training or instruction" in writing a grant proposal (26), case report (32), or press release (32). In the post-test, students reported the highest average gains in confidence, ability and familiarity with the press release, the case report, the grant proposal, as well as the structure of scientific papers. In all of these areas, students either reported pre-writing or teacher feedback on the first draft as the most helpful writing activities. Our findings suggest that for upperclassmen with no experience writing professional or post-graduate genres, low-stakes writing opportunities coupled with feedback from disciplinary faculty is an effective way to increase communication skills while learning course content.

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Cultivating Effort in Study Abroad: An Innovative Team Teaching Approach

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Some studies suggest faculty face barriers to participation in study abroad programs, including time, family and work priorities, and resources. Since U.S. student participation in study abroad has increased by more than 300% in the last 20 years, innovative strategies are necessary to ensure students have more international experiences, and instructors can maximize their participation. The purpose of this case study is to examine an innovative instructional strategy (team-teaching), used during a month-long agricultural study abroad program. Since 2012, four instructors have team-taught a study abroad program in a multi-institutional partnership of faculty and students from [State] Universities. All four instructors recruited and participated in classroom instruction before departure. Two instructors traveled with students and led field experiences for the first two weeks. The other two instructors joined the group after 10 days for a brief transitional overlap, then assumed instructional duties for the remaining two weeks, while the initial two instructors returned home. Benefits of the team-teaching approach are decreased time away from family and other university workload (instructors), increased recruitment and student engagement, renewed perspectives (instructors and students) during transition, and engagement with multiple viewpoints and contexts for enhanced learning (students). Challenges are maintaining instructional continuity and opportunity for disruption of students' assimilation and adaption processes. Strategies for overcoming these challenges include pre-departure meetings and programmatic team building. Outcomes include increased student participation, content mastery, and mentoring opportunities. Implications exist for additional research on innovative team-teaching approaches that could change international agriculture study abroad programs.

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A Pre-Post Perspective on Individual and Team Scores in a Team-Based Learning Course

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In Team-Based Learning (TBL), a readiness assessment test (RAT) is taken by individuals (iRAT), followed by student teams taking the same test (tRAT). This portion of the Readiness Assurance Process is designed to encourage individual preparation and accountability. The overall RAT process provides the course instructor real-time information regarding concepts students understood from individual preparation beforehand, and peer instruction while the tRAT is taken. Subsequently, the instructor identifies concepts students failed to comprehend and can focus instructional efforts to fill these gaps. Studies have shown that tRAT scores are consistently higher than iRAT scores. However, there is limited information regarding the impact of instruction post-RAT when students take hourly exams individually and as teams. Data was collected from a lower-division course, Principles of Agricultural Economics, taught using TBL. Student's t-tests were used to examine if individual and team scores improved post-RAT and post-instruction. Results showed that average individual and team scores on hourly exams were each significantly higher than those earned on individual and team RATs, respectively (p<0.0001). Additionally, the mean difference between individual and team scores was significantly higher (p=0.03) for hourly exams compared to RATs. The difference in individual and team scores on hourly exams also had a smaller standard deviation than that of RATs. This study revealed that instruction focusing on ideas students failed to capture at individual preparation (TBL model), rather than comprehensively addressing course concepts in a traditional lecture-oriented setting, still improved student performance on both individual and team test scores.

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Using Weekly Reflective Academic Journals to Track Learning in Content Heavy Classes

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Instructors of content heavy classes often lack real-time data on how students are progressing in class. Objective is to present Reflective Academic Journals as an approach to provide for a non-threatening, 2-way conversation between student and instructor. Students use a weekly, one-page, on-line journal to summarize their learning in class; ask questions; and to reflect on their learning. The instructor benefits because they receive feedback on the content presented. Journals can include a description of what happened in class; a summary of what the student learned that week; a personal response to a class discussion; a reflection on what the student enjoyed about the class; and express fears about an upcoming exam. In practice, the students benefit because they open up an empowering conversation with the instructor, use it to ask questions, and clear up misconceptions, all while taking responsibility for their learning. The instructor benefits because they obtain real time data on the student learning in that particular week. Questions raised in the journal can be addressed in the next class period. If general misconceptions exist among students, the instructor can track back and repeat critical information. Students in senior-level animal reproduction and animal physiology courses in their end-of-semester final summative journal and in course evaluations indicate that writing journals helped their learning. Frequencies of word mentions in final journals and course evaluations from classes during 2013-2015 were collected. Help, learning, and questions were used most often. Reflective academic journals are an effective tool to improve student learning.

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Creation and Implementation of a Campus-Wide Grant Award Program Recognizing Whole Departments for Excellence in Education

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While many programs recognize individual university faculty, few examples exist whereby an entire department is recognized for exceptional commitment to quality education. Conceptually, a departmental award is advantageous in several ways: 1) brings unity of purpose by enabling greater numbers of faculty to receive recognition for efforts around a common purpose; 2) incentivizes all faculty within a department to improve teaching; 3) provides opportunity for 21st century life-long learning by encouraging continued development of faculty and students; and, 4) stimulates pursuit of excellence through progress and change. The Auburn University Senate Departmental Award for Excellence in Education (DAEE) was initiated in 2014 by the campus Teaching Effectiveness Committee to provide a structure for both recognizing teaching excellence and for improvement efforts, to impact departmental cultures, not just individual faculty behavior, by recognizing the collective performance within an academic unit, and by supporting additional activities targeted toward instructional enhancement. Award winning departments receive $30K ($10 K annually for three years based on progress). Based on three years of administering DAEE, challenges surrounding establishment of the DAEE and award process include: original approval, promotion, timing, evaluation process and rubrics, recognition, grant/award management and on-going assessment of the impact of the program. An important goal of DAEE is creation of a continual campus-wide community of 67 units focused on conversation about teaching effectiveness in every department as applicant departments engage in analysis and reflection of instructional objectives and outcomes improvement. DAEE favors teaching enhancement through collaborative cultural change that may be more sustainable than individual award programs. Additional benefits include collaborative scholarship and heightened awareness of practices of award winning departments.

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Assessing Agricultural Leadership Academic Programs at 1862 Land-Grant Institutions

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Understanding the structure and perceptions surrounding academic degree granting agricultural leadership programs is imperative when aiming to improve these programs for sustainability. With historical roots at land-grant universities in departments of agricultural and extension education, agricultural leadership has shifted from a youth development focus to a vision for creating influential rural and community leaders for agriculture. While agricultural education research abounds, there's a lack of information focused on analyzing program structure, program demographics, the need for agricultural leadership, and suggestions for strengthening and advancing the discipline's work. This research study sought to understand the overall national make-up of agricultural leadership programs at 1862 land-grant universities, as well as characterize faculty perceptions surrounding those programs. An analysis of these universities revealed 26 institutions that offer for-credit academic programming related to agricultural leadership, with 10 offering majors, 12 offering minors, 7 offering graduate degrees, 12 offering concentrations and specializations, and 10 offering program certificates. Qualitative interviews with agricultural leadership faculty revealed academic programs were formed from an industry need. The discipline evolved by taking on a broad appeal, as well as experiencing growth through the expansion of community and rural development. When referencing the relevancy of agricultural leadership's role in academia, two themes emerged: a) agricultural leadership creates leaders through "human capital," and b) graduates promote industry growth through political, policy, and public influence. Therefore, participants recommended discipline-wide collaborative efforts to establish a professional organization, the creation of standardized discipline competencies, and organized opportunities to collaborate on grants and research projects.

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Integration of Project-Based Learning into a Summer Bridge Program

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The Bioenergy Summer Bridge Program at Oregon State University aims to increase retention

and graduation rates of first generation college students who come from underserved communities and backgrounds that are either rural, of low socioeconomic standing, or ethnic minorities. Summer bridge programs provide accelerated and focused learning opportunities for incoming college students to gain the knowledge and skills needed for college success. Many bridge programs focus on either connecting participants to college resources or on a specific academic track. Part of a USDA-funded comprehensive bioenergy education program, the Bioenergy Summer Bridge (BSB) utilizes a more student-centered approach that works to combine both a connection to college resources and a rigorous academic experience for students. A project-based learning strategy harnesses the motivation and interest of the students in the subject by engaging them in an authentic and meaningful collaborative project with a clearly defined end goal. The BSB uses this strategy, with bioenergy as the focus, to create a realistic college experience that supports participants as they develop skills, access resources, and make the personal connections that are directly transferable to their success in college. Pre-Post surveys were administered to the participants during the bridge program and again at the beginning of each subsequent school year. The results have shown positive impacts on persistence of the students involved. Further, participants report increases in self-efficacy, sense of belonging, and ability to set and follow through on goals.

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Exploring the Connection: Linking Leadership Skill Development with Curricular Experiences

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Linking specific curricular experiences directly to leadership development has the potential to enhance leadership education for students enrolled in colleges of agriculture. In this study, the objectives of the researchers were to link development in 13 leadership areas, as measured by the Leadership Needs Assessment (LNA), and specific learning experiences within an Oregon State University College of Agricultural Sciences leadership development program. To determine student leadership development, the researchers followed the Borich Needs Assessment model and measured student perceived importance and ability across all 13 constructs with both pre and post assessments. Mean weighted discrepancy scores (MWDS) were then calculated to determine student growth while engaged in the program. Results provided evidence indicating students experienced the strongest growth in understanding leadership (ΔMWDS = 2.26), commitment to serving (ΔMWDS = 2.11), enhancing communication (ΔMWDS = 1.97), ethical behavior (ΔMWDS = 1.95), and valuing diversity (ΔMWDS = 1.77). To explore the linkage with curricular experiences, the researchers administered a survey to the three faculty members involved in administering the program. Faculty members identified objectives for 52 leadership experiences and those leadership experiences were then linked back to student growth. Curricular experiences linked directly to student growth included program seminars, book readings, working with a mentor, and participation in a community organization. Research results provide a model and viable method for linking learning experiences and leadership skill development that provides a robust understanding of the relationship between learning experiences and leadership development in colleges of agriculture.

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Extension Program Planning: Volunteer Perceptions of the Purpose of Extension Program Area Committees

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Extension Program Area Committees are an integral part of the Extension program planning process. Volunteers serve on these committees to play an important role in assuring that Extension education remains relevant to the needs of the clientele served in their communities. A survey was administered to Program Area Committee

members serving the Agriculture and Natural Resources areas in counties across Texas. A stratified random sample was used to select 50 of 250 county extension offices in Texas. From that sample 34 counties (68%) provided rosters of committees that work directly with the Agriculture and Natural Resource programs providing a total of 451 participants. Those participants were asked to complete a survey that focused on the purpose, responsibilities and qualifications of program area committees. Volunteers were asked six questions related to their perceptions of the purpose of a program area committee. Questions focused on ensuring programs are relevant to local needs, developing educational programs, being an important part of the Extension educational process, ensuring programs are implemented in their communities, monitoring the impact of the agriculture programs and ensuring positive change in participants. The data showed that volunteers agree or strongly agree will all six statements. In summary these data support the job descriptions provided to committee members.

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Will Mom Approve? Parent Perceptions of Study Abroad Programs

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The number of college of agriculture students studying abroad has not kept pace with national participation growth. In recent studies, the student-choice construct has been used to identify factors that affect student's decisions about educational opportunities; however little empirical research exists measuring parental perceptions and influence related to study abroad. The purpose of this descriptive study was to identify parent opinions about study abroad programmatic components (i.e. length of experience, time of year, student classification, cost). Three objectives guided the study: 1) Identify preferred study abroad components, 2) describe parent perception of the importance of study abroad and 3) determine likelihood of parents to support study abroad. Descriptive survey methods were used. The target population (N=1,511) was comprised of parents and legal guardians of students in colleges of agriculture attending new student summer conferences at three southern U.S. universities. A response rate of 57% (n=868) was achieved, with respondents indicating junior year as the ideal academic classification and summer as the optimum time for participation. Respondents ranked 4-6 weeks as the most appropriate duration for study abroad, at a cost range from $2,000- $4,000, not including tuition. Overwhelmingly, parents are likely to support participation, with a mindset that study abroad is important to their students' academic experience. Results from this study should inform communication about study abroad, program planning and recruitment strategies as a means to increase college of agriculture student participation. Additional research may facilitate deeper understanding of parent perceptions, characteristics, and beliefs.

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Case-Based Gaming for Foodborne Diseases

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Students' passion for and retention of knowledge increases with hands-on learning experiences. Gaming makes a positive impact on the teaching and learning process, in particular on retention. For over twelve years, students (n=450) in the course Foodborne Diseases: Investigating Outbreaks, ANFS 230, have participated in interactive learning through the creation and play of board games based on original outbreak case studies. Working in multiple teams of 4-6 students, each team designed a different game graded on a rubric of incorporation of 9 elements of course content, including epidemiological and environmental investigations, control and prevention, and communication with the public. Game design varied in format to include traditional commercial board games, deck-building or virtual games. In one representative semester, volunteered responses to four open-ended questions reported students learning specifically related to the game. Of their comments 49% volunteered

synthesis of course material and reinforced learning was realized, 46% particularly noted creativity as a favorite aspect, and 100% indicated it as a fun/enjoyable project. The games were also used as a program assessment tool over two years for the programmatic goal of synthesis of information/critical thinking. Students (n=93) were assessed using an Inquiry and Analysis Rubric with three specific artifacts, each on a 4-point scale: 1) topic selection, 2) existing knowledge, research, and/or views, and 3) analysis with an average score of 10.93 out of 12 total points available. Students scored similarly in all three artifacts. Case-based board games encourage students to synthesize and apply knowledge learned in a creative format.

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Examining the Challenges and Supports Identified by Underrepresented Minority Students Enrolled in STEM Programs within a College of Agriculture

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This phenomenological study explored perspectives of underrepresented minority (URM) College of Agricultural Science students who were enrolled in a science-based minority student program regarding the challenges, support mechanisms, and success they experienced as they pursued a STEM related agricultural science major. Data were collected from 10 students who were part of a URM student support program at Oregon State University, funded by the National Institute of Food and Agriculture (NIFA award 2009-05243, 2011-30039), that provided financial support, peer mentoring, personal advising, faculty mentors, and research projects. Data consisted of in-depth, one-on-one semi-structured interviews, popular press publications, and biographical sketches written by participants about the program. Primary data analysis was performed using open coding. After the initial coding process, the data were coded for thematic content in which similar codes were grouped into

larger themes. Three themes emerged from the data and were identified as challenges, support, and successful balance. Additionally, a number of sub-themes were identified that help to construct an understanding of the participants' college experiences. The URM students faced challenges as a result of anxiety from academic rigors, balancing school and life responsibilities, and cultural dynamics. Students identified various support mechanisms that helped them find success. These included social support from peers and academic advisors as well as financial support from the university minority support program. Students expressed resilience and feeling successful in relation to personal growth and desired to share their stories and successes with future generations of students enrolled in STEM related agriculture careers.

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Are College Students Too Old for Toys and Games?

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When teaching college students, it is necessary to engage their attention in novel ways. Retention of information best occurs when students can relate information to their own life, put information in other real life contexts, or when the learning process is fun. In an effort to engage students in an activity applying class material covered in an Animal Diseases course to real life, farm toys and student-created backgrounds were used to develop a Foot and Mouth Disease scenario. Students created this at Delaware Valley University's ADay fair for the public. In the second year of this activity students chose a disease and created a table top scenario and poster. A similar approach was used in an Animal Anatomy and Physiology course, creating puzzles for hormone receptor interactions and having students match labels to anatomical parts. Students have also written "pen pal" letters from hormones to the body, played "pin the hormone on the animal model" to show where it comes from, played quiz bowl and Jeopardy-style review games for exams and done drawings of "animunculi" to illustrate the relative sensory input and output. The instructor and sometimes other faculty evaluate these activities with rubrics developed by the instructor in place

of traditional exams for assessment. Students enjoy such exercises and become more engaged in the learning process. These activities also foster critical thinking, communication skills in group work and adds the dimension of community outreach and education through presentation at the ADay fair.

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"Exploring Food Security" Crop Science Short-Term Study Abroad Program: Student Participants' Motivations and Concerns

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With the publicized benefits of international experiences, still a small percentage of university students in the United States study abroad. In attempts to make studying abroad more feasible for students, short-term study abroad programs have become popular. Of the students studying abroad, there has been a significant increase of those doing so in Costa Rica. In 2015, the Crop Science Department of North Carolina State University's College of Agriculture and Life Sciences formed its first short-term study abroad program, which was titled "Exploring Food Security in Costa Rica." Student participants of this 2015 program completed written questionnaires, responded to forum prompts, and participated in two rounds of focus groups: one prior to their international experience and one after. Participants answered questions on their motivations to participate in a short-term study abroad program, concerns prior to and during the international experience, and expectations of the program. Using a coding process, data was broken into themes and subthemes. Students were motivated to participate in the short-term study abroad program because of the following themes: program content, career building opportunities, increased cultural awareness, and short-term length aspect. The food security focus attracted students to this program. When examining the student participants' concerns, the following themes arose: communication, completing work for other classes before going abroad, and air travel issues. This presentation will provide detailed information about the short-term study abroad program, students' responses regarding their motivations and concerns, and recommendations that can be used for planning future short-term study abroad programs.

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"Beef It's What's for Dinner" Advocacy Service-Learning Project

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In the United States it is estimated that 98% of the population is not involved in the production of food, which results in a clear lack of knowledge of agricultural practices. "Beef It's What's for Dinner" advocacy service-learning project was designed to engage students in an experience of advocating for agriculture with consumers, specifically for beef production as part of their Beef Cattle Production and Management course in 2009 through 2015 (n=106 students). Students worked in teams and selected topics they felt consumers needed more information about, such as antibiotics, implants, beef production methods, products made from cattle, beef nutrition and animal welfare. Each team created a display and prepared a favorite beef recipe to share at the campus event with attendees from all across campus. In 2014 and 2015 they also surveyed the initial knowledge of the participants on their topic. This advocacy provided a service for the agriculture industry to help educate the average consumer which has little knowledge of how beef is produced. Students completed a survey for the project with the following conclusions: 1) 99.9% felt this project was a good way to provide information about beef production to the public, 2) 99.8% recommended future classes repeat the project, 3) 88.7% felt they learned information about beef and/or cattle while doing the project. This project has been held in partnership with Kansas Farm Bureau, and included displays from numerous student clubs and other agriculture courses.

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A SWOT Analysis of the Agriculture Courses for Dual-Credit Initiative

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Texas A&M University-Commerce received a Secondary, Postsecondary and Agriculture in the Classroom (SPECA) grant from USDA to deliver two courses through a dual-credit arrangement with three partnership schools. The project goals were to deliver introductory animal and food science courses in collaboration with schools that were selected based on location, student demographics, and teachers in the disciplines. This presentation will focus on the positive aspects of the project (strengths and opportunities) as well as the challenges (weaknesses and threats) encountered in preparing, delivering, and evaluating dual-credit instruction. A qualified team at the university and high school levels provided a strong foundation for establishing this pilot project offering university courses at low cost. The target courses were chosen because the associated secondary courses count for science credit toward graduation requirements, creating a potentially diverse group of students who may not have been previously interested in animal or food sciences. Challenges were encountered in the promotion and delivery of dual-credit instruction. Personnel changes, university admission processes, scheduling, and priorities of high school stakeholders presented a variety of obstacles to overcome. One of the most significant challenges was a breakdown in communication as personnel and institutional priorities changed. Changes in personnel also resulted in the delivery model being revised. Since this was this first time the partnership schools offered dual-credit instruction in agricultural and food sciences, expectations regarding roles and responsibilities of various stakeholders were unclear. The sharing of these experiences will offer insight for other institutions considering implementation of dual-credit instruction in agriculture.

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Financial Analysis of FFA Career Development Events Hosted by Texas A&M University-Commerce for 2012-2014

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Texas A&M University-Commerce hosts the annual FFA Career Development Event (CDEs) with more than 1,500 secondary agriculture students participating. The area CDEs are essential for determining which teams qualify for state competition. Resources such as facilities, materials, plant and animal specimens, event coordinators, and volunteers are essential to hosting the CDEs. The purpose of this study was to determine the costs, including in-kind contributions, associated with hosting each of the CDEs held Texas A&M University-Commerce for the years 2012, 2013, and 2014. A comparison between expenses and revenue for each CDE was conducted to determine if the total entry fees collected for each CDE were sufficient to cover associated costs. Financial data for this study were collected through open record requests, and were analyzed by calculating an average cash expense cost per team, an average cost with in-kind contribution per team, and an average revenue per team for 2012, 2013, and 2014. Based on this study, it was concluded that the annual CDEs hosted by the university are not of a great financial burden to the institution or host department. Throughout the three years studied, the overall average cost per team for an event did not exceed the entry fee for that year, nor did total costs exceed the overall revenue for that year.

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Bringing Microeconomic Theory to Life

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Assessments in microeconomics courses generally include problem sets and exams where students draw graphs or solve math-based problems, assessing knowledge of material. Students may be asked to explain graphs or answers, tapping into comprehension. However, these assessments rarely lead to application, analysis,

synthesis, or evaluation. During the 2014 and 2015 offerings of a microeconomics course in an agricultural economics department, I added writing assignments and in-class application exercises to reach higher learning objectives. In 2014, problem sets and exams remained focused on knowledge and comprehension. At the end of the semester, for each assignment type, the students were asked if they strongly disagreed/disagreed/agreed/strongly agreed with the statement: "The assignment significantly increased my understanding of course material." Second, they were asked to rank assignments based on how helpful they were in developing understanding of material. While I observed students applying, analyzing, synthesizing, and evaluating models learned in class while working on application assignments, in 2014 problem sets and exams ranked higher than application assignments. In 2015, I added application-type questions to exams, hypothesizing that students used exam performance as their benchmark of knowledge acquisition. Without including applications in exams, I was decreasing the importance of higher levels of learning in the students' minds. This year, students still ranked problem sets first according to questions 1 and 2, but writing assignments moved into second place. Interestingly, exams ranked last according to question 2 in 2015. Comparing across years, the level of importance attributed to writing assignments was statistically significantly higher in 2015.

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Connecting with Students: Online Tools to Help with Retention

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Previous literature indicates students are more likely to stay at a university if they feel connected with their academic program. To increase this connection, programs are using online tools like social media and listerves. The purpose of this study was to determine how current students perceived social media and listerve use by their academic program and to explore their preferences for content type. A survey was used to address this purpose with 283 students from a Midwestern land-grant institution. Questions were check all that apply, semantic differential on a seven-point

scale, and a seven-point Likert scale with 1 being the negative end of the scale and 7 being the positive end. Results indicated students believed their academic programs were using social media the right amount (M = 4.96, SD = 1.36), were on the correct platforms (M = 3.79, SD = 1.62), and posted what the students wanted to see (M = 3.92, SD = 1.35). Content preferences for social media and listserves were similar with high percentages for industry information, internships, program news, and student projects. Students indicated they would like to see their academic programs post an average of 2-3 times per week. Students open-ended comments indicated they would like to see more of a personal connection on social media like pictures of professors from previous years, information about professors' research and on-going projects, and prizes and giveaways. Requests for information on listserves were more about efficiency like grouping information together and sending out deadlines and scholarship information.

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The Influence of a Social System on Students' Understanding of Global Food Security

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According to literature, there will be a shortage of food for at least a billion people in 2050. The Food and Agricultural Organization of the United Nations indicated food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. A social system is one of the key components of the diffusion of innovations. The structure of a social system can be a formal or informal arrangement of the individuals within the system that allows a degree of predictability in social behavior. A required course on change in the college of agriculture seeks to enhance undergraduate students' understanding of global food security issues. Survey research was utilized to examine diffusion components that have a relationship with students' understanding of global food security. Six hundred fifty-seven students were surveyed in the change course in 2014 and 2015,

and four hundred twelve (n = 412) responded. Social system had the strongest relationship (r = 0.63) and accounted for the most variance (39%) in students' understanding of global food security. The data suggested students are influenced more by social systems than communication channels and the innovation. The implications indicate a necessity to understand student norms to better understand social systems to aid in increasing understanding of food security. Contrary to the literature, the innovation and communication channels are not always the initial components that influence adoption.

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Food and Agricultural Education Information System Impact Study on Gender Representation in Colleges of Agriculture and Life Sciences from 2002-2013

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Funded by the USDA, the Food and Agricultural Education Information System (FAEIS) has been compiling nationwide higher education data for agriculture, natural resources, family and consumer sciences, and related disciplines, for 35 years. These data include undergraduate and graduate student enrollment, degrees awarded at all levels, placement and faculty numbers and salaries by rank and discipline stratified by gender and ethnicity. FAEIS data can be used in recruiting and benchmarking students and faculty, as well as institutional planning. The objective of this presentation is to highlight key areas where FAEIS findings can stimulate dialogue to support agriculture and life science programming for students and faculty. Specifically, as a part of an ongoing initiative to investigate long-term national trends pertinent to enhancing diversity in agriculture and life sciences, we examined changes in gender diversity among students and faculty across land grant institutions (n=69) between the years of 2002 to 2013. First, our results illustrate male-majority gender ratios across two of the four major program areas assessed among students and faculty. Second, our findings demonstrate that only the Family and Consumer Science program area had a female-majority faculty and student body, while the Veterinary Medicine area had a majority male faculty with majority female

student body ratio. In sum, we tie these and similar findings to a burgeoning national conversation for creating gender inclusive and responsive academic programing and research in colleges of agriculture and life sciences. We conclude with the importance of land-grant universities taking leadership in that crucial conversation.

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A Baseline for Learning Outcome Assessment: Lessons from Michigan State University

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Learning outcomes are a set of measurable, demonstrable changes in knowledge, skills and behaviors resulting from an educational experience. Although educators have developed tools and techniques to assess learning outcomes for an individual lesson or a course, assessing a common set of learning outcomes for all students in an undergraduate program has been a topic of on-going debate and discussion. Specifically, questions are asked about how an agriculture college can measure student learning outcomes in a convenient but systematic way. This research focuses on learning outcome assessment in the College of Agriculture and Natural Resources (CANR) at Michigan State University. A review of literature and CANR curriculum resulted in identification of five domains of learning outcomes. A web survey was designed to measure impacts of undergraduate curricula in five domains of learning outcomes: analytical thinking, cultural understanding, effective citizenship, effective communication and integrated reasoning. Graduating seniors were asked to participate in the survey during the convocation week. Students were asked to self-assess their competency on a 1 to 5 scale with 5 being very high and 1 being very low. A panel of faculty members validated the instrument and it was field tested with fall 2015 graduating seniors. Reliability was tested using Cronbach's alpha, and coefficients for five constructs ranged from 0.82 to 0.92, indicating that the instrument was reliable. Findings demonstrated that CANR students rated themselves high in all five domains of learning outcomes. This database will serve as a baseline for tracking learning outcomes for all undergraduate majors within the college.

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TPACK to GPACK? The Examination of the Technological Pedagogical Content Knowledge Framework as a Model for the Integration of Global Content into College of Agriculture Classrooms

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There are strong arguments for multidimensional efforts in the internationalization of curriculum in colleges of agriculture. One dimension often overlooked is the overall internationalization of on-campus, content-specific courses. However, it can be difficult to promote and maintain this approach. In this study, we support the assumption that providing faculty training will better prepare and increase the likelihood that faculty will internationalize their courses. The technological pedagogical content knowledge model (TPACK) presented by Mishra and Koehler (2007) has served as a valuable framework to determine the knowledge areas needed for effective integration of technology into the classroom, namely content knowledge, pedagogical knowledge, technological knowledge, and all the intersections among them. With the substitution of global content knowledge for that of technological knowledge, we propose the GPACK model as a framework for design of faculty development programs. This study examines a one-year faculty development program to internationalize on-campus courses. The objectives of this study were to: (1) identify the elements of the program which supported acquisition of knowledge in the GPACK areas and (2) determine the suitability of the GPACK model as a framework for similar programs. Qualitative data was collected through semi-structured interviews with program participants (N=8). Findings show that nearly all faculty claimed knowledge acquisition in all GPACK areas. The international experience component of the program was essential for connecting knowledge areas, particularly through social interactions and engagement with Costa Ricans. Most participants indicated that global pedagogical knowledge was the area in which they still felt less assured.

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Student Interest is the Strongest Determinant of Success in Introductory College Courses Related to Environmental Science

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This study examined how student background impacts learning by assessing four predictive aspects of academic performance in environmental science college courses: 1) student interest in environmental science, 2) previous environmental science education, 3) childhood exposure to the environment, and 4) childhood residence setting. Nearly 800 students were surveyed in 12 environmental science college courses to determine which aspects of background predict success (measured by final grade) in the course. Interest in the natural environment was found to be the strongest predictor of success, where students that reported greater interest in the natural environment had increased odds of academic success. Childhood residence setting was also strongly related of student success, where students that grew up in increasingly rural communities showed an increase in their odds of academic success. Additionally, one demographic question, class rank, was shown to predict success, with higher ranked students (e.g. seniors) more likely to succeed than lower ranked students (e.g. freshmen). Conversely, previous environmental science education and childhood exposure to the environment were not found to predict the final grade in environmental science college courses. While instructors cannot influence the types of communities their students come from or their students' class ranks, it is important to be aware of these disparities and adjust teaching or institutional practices as needed. Moreover, these data suggest revising some long held assumptions of motivation and student learning. Ultimately, these findings may help instructors identify at-risk students and also inform teaching practices that support learning for all students regardless of background.

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Developing Innovative Student Projects for Comprehensive Review of Course Content

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Students often expect some form of study guide or exam review session prior to final exams. Providing students with these enabling review materials without creating a great deal of additional work for the instructor is a challenge. Developing projects that requires the student to take ownership of their learning as well as create a test bank for the instructor was the primary objective of this project. Assigning a group project of developing a "Board Game" created the opportunity for students to review all of the course material and prepare questions for the rest of the class to review. Time was given in class for the students to play the completed games as a chance to review potential questions on the exam. Questions were submitted to the instructor and selected questions were placed on the final exam. Another form of review was the assignment of a self-guided field trip brochure that required the students to reflect on the key learning objectives of the course. The development of a brochure allowed the students a chance to share their experience with the rest of the class without taking class time. A survey was conducted following the final exam and the students (n=50) responded 3.58 on a Likert scale of 1-5 (1=not at all and 5=a great deal) on how well the projects prepared them for the final exam. Several comments suggested that it was a creative way to help students review for the final exam and that they enjoyed the projects.

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Foundational Components of a Student Teaching Experience

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In order to create a positive and educational student teaching experience, it is imperative that student teachers and cooperating teachers believe in a common purpose for the student teaching experience. The purpose of this study was to investigate perceptions of student teachers and their cooperating teachers as to the significance of all components of the student teaching experience within an agricultural education program. Three years of agricultural education student teachers at Tarleton State University (N=129) and their cooperating teachers (N=59) were asked to rate the level of importance of thirteen specific elements of the student teaching experience using a five point Likert scale (5=Very Important, 1=Not Important). These thirteen specific elements were based on a weekly student teacher log created and used to monitor student teacher activities and engagement during their twelve-week experience. The analysis of information gathered showed that student teachers and cooperating teachers agreed that twelve of the thirteen components of the student teaching experience rated as important. Preparation for classroom teaching, Classroom/Laboratory teaching, CDE preparation, and Participation in local FFA activities rated highest (M=4.6) followed closely by Participation in FFA activities above the chapter level and Laboratory preparation/Maintenance (M=4.5). Administration duties, SAE observation, Observing cooperating teacher, Conference time with cooperating teacher, Grading student work, and Administrative In-service/Meetings were also rated as important. The component, Adult education rated as neutral (M=3.7) by both groups. This research affirms and authenticates the use of these components to monitor student teacher activities and engagement.

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Assessing Student Demographics in a Non-Land Grant Agriculture Program

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The Department of Agriculture at Illinois State University has experienced 150% growth in undergraduate enrollment since 2007, with a 47% increase between 2012 and 2015. This study seeks to identify key demographic characteristics of this student population, along with factors influencing enrollment in the ISU agriculture program. A survey was administered over three semesters to students enrolled in an introductory agriculture course taken primarily by freshmen and transfer

students (n=474). Questions addressed students' backgrounds, prior agricultural experiences, demographics, and reasons for enrolling in the ISU agriculture program. The agribusiness sequence accounted for the highest proportion of the student population (45.7%), with 56.9% of agribusiness majors reporting farm backgrounds. However, the majority of survey respondents (62%) did not grow up on farms, and while 53% of respondents attended high schools offering agriculture programs, only 36% reported prior FFA membership. Transfer students comprise 53% of the department's student body; FFA members were more than twice as likely to first attend a community college as they were to enroll at ISU as freshmen (68% vs. 32%). Pearson correlation analysis resulted in positive correlations (p<0.01) associating community college transfers to both prior FFA membership and having rural farm backgrounds. The most frequently reported factors prompting students' decisions to enroll in the ISU agriculture program included: influence of family/friends with connections to the program, availability of the desired academic sequence, and the program's academic reputation. This study highlights characteristics of a rapidly-growing student population, and the survey will continue to be administered in subsequent semesters.

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Facilitating Interdisciplinary Teaching and Learning in Agriculture

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Interdisciplinary teaching and learning are increasingly suggested as a way to prepare students to collaborate, innovate, and solve complex problems. Agriculture provides an excellent context for teaching integrated, interdisciplinary curricula. The purpose of this study was to connect the literature bases of interdisciplinary STEM and agricultural teacher education. An integrative literature review using the Thomson Reuters Web of Science database identified 16 journal articles relevant to interdisciplinary science, technology, engineering, and mathematics teacher preparation and professional development. These articles were synthesized with agriculture teacher

preparation literature using the constant comparative method. Ten principles for interdisciplinary teaching and teacher education were identified: (a) emphasis on practice, reflection on practice, and experiential learning; (b) knowledge in context of real world issues; (c) emphasis on problem solving skills or problem-based learning; (d) integration of content with pedagogical content knowledge; (e) broad content knowledge across many areas with specialization in at least one area; (f) 21st century competencies; (g) out-of-classroom learning; (h) commitment to diversity; (i) collaboration between education and disciplinary departments; and (j) post-program support. A conceptual model for teacher preparation and faculty professional development was created based on previous conceptual models and the principles. Connecting and synthesizing the literature bases provided valuable insights for teaching and faculty professional development in agricultural and other interdisciplinary contexts.

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The Impact of Experiential Learning Dimensions for a Study-Abroad Program on Academic Learning in Food Science

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Over the U.S. Thanksgiving Break, UGA Costa Rica offers a study-abroad program entitled "Coffee (el Grano de Oro): From Bean to Cup." Careful efforts are made to provide a rigorous curriculum where student experiences are integrated with content-specific academic learning objectives. The objective of this study was to explore which teaching strategies best addressed the course's content-specific learning objectives. Data sources included 1) students' (N=19) reflective journal and answers to a daily academic learning prompt; 2) a qualitative and quantitative questionnaire where students reported growth in competencies and identified the most effective teaching strategies for each learning objective; and 3) a group debriefing session on the students' learning experience. The most effective teaching strategies were experiential learning opportunities such as visiting coffee farms, talking directly to the farmers, and integrating the laboratory experiments with the field visits. Most students noted that the laboratory curriculum was

more effective than the "labs" they usually have in the United States. Students argued that they used the same materials they had collected, processed, and discussed with Costa Rican producers, allowing them to link the experiment with the reality of the farmers, consider the whole process, understand the value and application of the experiments and impact of the results, and apply them to real-world situations. These results support the argument that experiential learning opportunities increase the depth and breadth of a student's content knowledge acquisition, and that study abroad can add value to science content-specific learning objectives in addition to cultural and personal growth.

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Reflective Narratives Mapped to Learning Objectives Prove More Beneficial than Quizzes

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Many authors have published methods of learning objectives and assessment based on the original Bloom's Taxonomy of Educational Objectives. Writing, mapping, and assessing these outcomes using short answer or selective quiz questions often assess learning at a lower level than intended in the stated learning objectives. The teaching innovation used in a graduate-level International Engagement and Development Strategies course (n=15) and an undergraduate Humans and Cultural Diversity study tour course (n=20). In lieu of quizzes, two-part reflections with part one being *"Please type a 250-word narrative abstract reflection of how you react to what you have learned and how this impacted your understanding the course topics to-date in this word document here:"* Part two is *"Considering the course and experiences to date, please help us reflect on how the class is addressing each statement by rating how you feel that the following goals are occurring:"*. Students rated their understanding of the stated course learning outcomes on a 1 (not at all) to a 5-6 (somewhat) and a 10 (very successfully). Course had different learning objectives and student sequentially rated their growth against the course learning objectives for each section of the topics. Not only did the narrative abstracts reveal more thoughtful learning and connections between topics and applications, the

numeric results of the Likert-scale method allowed clear indication of the student's self-perceived accomplishment of the course learning objectives. This innovative method of assessing learning increased reflective learning and was much more appreciated by the graduate students than the undergraduate students.

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Enhancing Student Success in International Programs

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International opportunities have increasingly become priorities for higher education institutions to provide valuable academic and professional opportunities for students. The University of Arkansas established a campus-wide goal of 25% international program participation by 2020; when only 3% of Bumpers College students participated in an international program prior to 2012. The Bumpers College established an International Programs Office (IPO) in August 2013 to create international experiences to enhance students' marketability for career and academic opportunities. This study assessed College students to determine preferences for international programs and preferred communications. Surveys were administered to students (N=338) in large enrollment courses in 2015. Students who were interested in an international experience (88%) were most interested in internships (67%), study abroad (58%), research (22%), faculty-led (22%), service learning (21%), and exchange (18%). Regarding preferred methods of communication about international experiences, students selected email to all students (60%), classroom announcements (48%), website (42%), personalized emails from faculty/advisor (33%), brochures (29%), information sessions (23%), and the Study Abroad Fair (21%). When seeking information, students were most likely to contact their academic advisor (68%), the Study Abroad Office (26%), peers (21%), faculty (20%), and IPO staff (10%). Students utilize digital media (74%) and face-to-face interaction (55%) when seeking information. This data suggests that academic advisors need to promote and be informed of international experiences as students' preferred contact. The high interest in interna-

tional programs supports increased student interest. This data allowed the IPO to adapt communications efforts to meet student preferences and increase awareness of international opportunities.

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Gathering Women to Cultivate Agriculturally Empowered and Engaged Learning

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Women continue to enter the field of agriculture through a variety of choices and circumstances in their lives. Extension faculty at Eastern Land Grant Universities modified the national Annie's Project to engage females with diverse interests in pursuing agricultural knowledge and skills specific to the region. Program development within the Annie's Project classes has utilized a spectrum of instructors with formal and non-formal delivery methods. The predominant educational emphasis is to deliver risk and farm management training to women in the region. Focus topics for classes reflect the diverse agricultural enterprises within the state. Since its inception in 2008, *514* individuals have completed the program. The holistic mentoring threaded throughout the program enabled the participants to share learning experiences in an open-minded environment while building upon the research shared by professionals. Descriptive surveys reported 94% of participants intending to increase communication and family relations, with an 18-month follow-up stating the continued efforts by 83% of participants. Initially 98% of participants stated an intent to use computers to increase farm efficiency, while follow-up responses revealed 74% continued to apply their newly acquired skills. Furthermore, personal testimonies shared "re-confirms and re-empowers me (participants) as a business partner in our operation" and how the program "provides the inspiration and sparks initiative". The expansion of the program across the region to 20 sites, continued requests for supplemental programming into emerging agricultural fields of study and the desire for an empowering mentorship learning environment continues to draw females to Extension hosted agricultural learning events.

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Using Art to Evaluate Changed Student Views of Insect-Person Interactions in an Undergraduate Entomology Course

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Entomology has become an increasingly popular option at both land grant institutions and elsewhere as a college science elective, among non-science majors. Insects are the most diverse and abundant organisms on the Earth, and they impact almost every aspect of human lives. These impacts can be directly positive or negative because insects cause discomfort or fear in people due to their ability to fly, jump, and at times sting. At Oklahoma State University, Entomology 2003, Insects and Society, is a popular class taught to approximately 350 non-science majors every semester. The goals of the class are to share the wonder of insects, highlight their importance in both benefiting and harming human society, and increase science literacy among those enrolled. To determine whether the goals were met, students were assessed through drawing exercises. The majority of student drawings on the first day of class contained images of negative interactions including people being afraid, disgusted, or even stung or killed by insects. In addition, images depicted people killing insects through stomping them or applying pesticide. However, at the end of the semester, the majority of student drawings showed positive interactions and an appreciation for the beauty of insects, their role in pollination, and a lack of fear. Therefore, students' views of the insect-person interaction changed substantially in a positive manner throughout the 16-week semester. In all, students substantially improved their agricultural science literacy, and were able to recognize insects as vital to the Earth's viability.

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Computer Technology Competency Needs for Students Enrolled in Colleges of Agriculture

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Computer technology competency for students at the collegiate level is often assumed to be high given the ever-present technology-driven world and the need for technology-savvy graduates. The purpose of this study was to investigate the literature to a) understand how the agricultural workforce has changed in terms of technology needs for graduates, b) identify disconnect between current workforce needs and technology skills and knowledge being taught in agricultural education, and c) identify research questions that need examination. These objectives were measured through a meta-analysis based on technology acceptance in the workforce and current use of technology in agricultural education. The analysis specifically focused on articles in journals of agriculture education; however, the search extended to journals related to college teaching, technology in education, and education/career research. The results revealed documentation of the emergence of new technological innovations and a change in the agricultural workforce. Workforce needs for graduates with computer skills is greater than ever. However, the meta-analysis revealed a mismatch between the computer skills the agricultural workforce requires and the current computer skills of graduates. Implications call for a need to prepare students for the workforce by adding computer technology competencies into the curriculum.

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Mission Critical: Enhancing Students' Critical Thinking Skills Through Study Abroad

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Critical thinking skills in a National Institute of Food and Agriculture (NIFA) project were defined as "students' abilities to evaluate information, appraise others' ideas and views, solve problems, and to communicate ideas effectively." This case study helped us assess students' critical thinking skills as a part of an international agricultural study abroad program. Students from Texas A&M and Prairie View A&M participated in an agriculture-oriented study abroad (Sub-Saharan Africa) program for the past two years. Project directors

developed and refined "deep reflection" critical thinking activities that were administered every 2-3 days. Students' personal reflections (pre- and post-experience responses) provided insights about critical thinking skills. Content analyses showed students' pre-program beliefs were simply to "analyze data and make informed decisions or judgments." Following their study abroad experience, students' critical thinking was described as "1) accounting for others' cultural thoughts and belief systems; 2) considering cross-cultural effects in their decisions; 3) achieving deep reflection/analysis; and 4) developing a willingness for research." Project directors used consistent instructional methods, including daily application and reinforcement of the NIFA-based critical thinking skills definition. We conclude this program deepened students' understanding of critical thinking, especially accounting for cultural effects on decision making. A participant stated, "…[I] *have a new perspective on critical thinking. We've seen people who have almost nothing; they have to make decisions that truly affect their livelihood every day. To me, that's a more important level of critical thinking*." Study abroad practitioners should share and compare programmatic methods for enhancing students' critical thinking skills.

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The Not So "Ugly American:" How Study Abroad Enhances Students' Professionalism Skills

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This case study examined students' learning outcomes related to professionalism skills. Professionalism skills affect employability. Advancement of such skills in a National Institute of Food and Agriculture (NIFA) project were deemed critically important outcomes. Professionalism is one's behavior and interaction with others, specifically having respect for others, being honest and ethical, and knowing one's workplace value systems. Professionalism also includes the ability to work and communicate with a specific audi-

ence: to be concise, quick, relevant, and balanced in response to topical issues; and to present information in ways that speak directly to broad audiences with varied economic, political, social or environmental views. Study abroad offers unique opportunities to increase students' professionalism skills through intercultural interactions (monochronic vs. polychromic). Students from two U.S. universities participated in an agriculture-oriented study abroad program where they interacted with multiple groups (subsistence to commercial farmers) and with varying ethnic populations. Content analysis of two years' data (pre- and post-travel reflections) provided insights on their professionalism skills. Results revealed that before their experiences, students believed professional skills were mainly about respect, etiquette, and workplace decorum, such as timeliness and dress code. Unprofessional skills were viewed as being disrespectful to others and oneself. Post-travel views on professionalism changed to include using appropriate speech and behavior in specific settings, punctuality, and being attentive to colleagues' discourse, rather than being distracted by their environment. Project directors used intercultural activities to help U.S. students understand and refine their professionalism skills in this international agricultural study abroad program.

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Agroecology as a Tool to Improve Science Capacity in Agriculture Through Participatory Research, Education, and Extension

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Given the decades-long decline in student interest in food, agriculture, natural resources and related sciences, a radical transformation of undergraduate education−especially in the STEM related fields−may be required to increase our capacity and resilience in dealing with these issues. At the University of Texas Rio Grande Valley, one of the largest federally designated public Hispanic Serving Institutions, we've established the UTRGV Agroecology Program and the Subtropical Organic Agriculture Research (SOAR) Partnership, an academic platform designed to address both (1) the stakeholder- identified barriers

to sustainable agriculture and resilient food systems through student-led research and (2) the disproportionate representation of Hispanic students in the agricultural workforce. To date, students in the UTRGV Agroecology Program have conducted research that has led to scientific publications, web-accessible literature and videos, and a farmer-friendly guidebook to pest and beneficial insects on brassica crops and have given more than 2 dozen scientific and extension presentations at farmer-field days or conferences. In the last three years, a total of the Agroecology program has also provided internships/service learning opportunities to 28 students, 24 (86%) of which are Hispanic. All of these students are pursuing agricultural related degrees and many of those that have graduated are pursuing graduate studies in agriculture related science or are working in agriculture careers.

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Engaging Students' Emotions and Logic to Address Wicked Problems

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Students today are challenged with a number of complex societal issues or wicked problems, such as climate change, racial injustices, and global peace. For this next generation of problem solvers many colleges of agriculture have introduced coursework to support the acquisition of foundational knowledge pertaining to these issues. At the University of Florida, a course titled Intercultural Communication has provided the framework for teaching students about the implications of culture and identity with respect to our rapidly changing world. The purpose of this proposal is to present a strategy for guiding students through thinking about complex, value laden problems, demonstrated through its application in the course Intercultural Communication. Emotionally Engaged Thinking (EET) was established in 2013 as a means for encouraging students to actively engage with their emotions during the decision-making process. EET uses the FACE Method, which is a four-step process that promotes the recognition of emotion through Foundational Awareness, real-world problems through Authentic Engagement, perspective taking through Connective Analysis, and action through

Empowerment and Change. By providing the space for students to be aware of their emotions of these issues, they are more likely to authentically engage. However, because the brain actively prohibits the processing of both emotion and logic simultaneously, we often are unable to transition from one to the other very easily. Yet, with a series of four questions designed to align with the FACE Method instructors now have a tool to intentionally move students from emotion to logic to action.

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Interdisciplinary EAAT Course Assessment

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The University of Arkansas Department of Animal Science (ANSC) is committed to integrating Animal Science with other fields of study. Supported by an American Quarter Horse Foundation grant, an Equine Assisted Activities and Therapies (EAAT) class was offered. The class encompassed two broad areas of study – client groups with physical, developmental or emotional disabilities, and the horse as a therapeutic partner. The 37 enrolled students were given pre- and post-tests to measure gain in knowledge for each component. There were 16 questions in the pre-test and post-test for the horse, and 16 questions concerning the human side of the equation. Data was analyzed by undergraduate major as either ANSC (n=24) or non-ANSC (n=13). Non-ANSC majors included students majoring in Psychology, Social Work, Criminal Justice, Kinesiology, Special Education and Mathematics. ANSC majors demonstrated 34% increase in knowledge; non-ANSC majors demonstrated 10% increase in knowledge concerning client bases. ANSC majors demonstrated 20% increase and non-ANSC majors demonstrated 30% increase in knowledge concerning the horse and his role as a therapeutic partner. As was revealed by the post-test, all students had a firm grasp of clients that EAAT can successfully serve and the horse as a therapeutic partner. An anonymous survey administered at the end of the semester revealed that 80% of students, regardless of major, had increased interest in EAAT and 95% hoped to volunteer or work with an EAAT agency in the future. Additionally, data gathered has helped improve

future EAAT courses and guided the trajectory of future EAAT offerings.

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Perceptions Concerning Student-Instructor Interaction using the IDEA Student Evaluation

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Student evaluations, such as the IDEA survey, are often used by educators to evaluate the quality of teaching. However, a student's response to each prompt on the evaluation is determined by their individual perception of the meaning of that prompt. The objective of this study was to determine if perceptions of these prompts differed among students with a focus on questions involving student-instructor interaction. To accomplish this, the IDEA survey was administered to 279 students who were instructed to rewrite each prompt in their own words. Responses were then categorized and counted. As expected, responses for each prompt varied, but some clear patterns emerged. In some cases, the majority of responses to prompts, like those pertaining to instructor showing personal interest in students, instructors helping students answer their own questions, and instructors providing feedback to students, fell into one or two categories. This agreement among students indicated a clear understanding of those prompts. However, prompts concerning instructors explaining reasons for criticism and instructors encouraging interaction outside of class fell into five or six categories and indicated a difference of opinion among students on the meaning of the prompt. No more than 58% of students were in agreement on the meaning of any one prompt. Therefore, when educators use these evaluations to improve the quality of teaching, they must be aware how they interpret a certain prompt may be different from how their students interpret the prompt. Understanding where the greatest disparities exist will help educators utilize student feedback more effectively.

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Identifying International Agriculture Concepts for School-Based Agricultural Education Curricula

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Today's agriculture industry is connected socially, culturally, politically, and economically in simple and complex ways. This globalization has created an emerging need for agricultural education in the United States to take a more globalized approach in preparing students for future careers. The purpose of this study was to identify international agriculture concepts for inclusion in school-based agricultural education curricula. A Delphi was used to obtain a general consensus by a panel of 17 experts consisting of agriculture teachers, teacher educator's and curriculum specialists. An 80% agreement rate was determined a priori to retain a concept or represent a general consensus. The panel identified 24 overarching concepts that were categorized into five themes: (a) production, (b) business, (c) culture, (d) environment, and (e) miscellaneous. Interestingly, the environmental concepts that were deemed critical, all used the word global or world. This finding illustrates the importance of teaching environmental challenges as global challenges and not isolated events in a particular country. Five of the 24 concepts had a 100% agreement: (a) challenges of food distribution, (b) international career opportunities in agriculture; (c) global role of water use in agriculture, (d) impact of the world food demand on the environment, and (e) overview of world hunger. We recommend the 24 concept be used by curriculum specialist to internationalize the secondary Agriculture, Food, and Natural Resources Career Cluster. Future research should investigate the utility and secondary students'/teachers' perceptions of the concepts, best practices for teaching globalized content, and learners' development of global workplace skills.

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Using Animation Technology in Teaching Social Justice to Collegiate Agriculture Students

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Student resistance to social justice education has been well documented in the literature. Teaching a diversity and social justice course to agriculture students comes with its challenges, and as instructors, we constantly look for new techniques in increasing student receptivity and engagement. The purpose of this study was to investigate the impact of adding audio and visual materials to a previously text-based activity. When presented with character biographies, we hypothesized that with exposure to a video and audio version of the biography, the participants would form different opinions of the characters compared to those exposed only to a text-based transcript of the biographies. Our control groups completed an activity where they read 12 character descriptions and had to choose 3 for a survival scenario; our treatment groups completed the same activity, but were shown animated characters who narrated their descriptions. We found no significant difference between character selections in the treatment and control groups, which leads us to believe that the animations don't lead to adverse reactions from students. These findings are significant as we plan to incorporate virtual reality (VR) technologies into our teaching. The capability of immersing a person into a fully virtual space can allow instructors to teach students complex procedures which allow them to experience virtual situations. Our findings will allow us to eliminate "adverse reaction to the animation" as a confounding variable as we use these animated characters to further develop VR technologies in simulations about race, disability, and other topics of social justice education.

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Perceptions Concerning Instructor's Attempts to Motivate or Challenge Students Using the IDEA Student Evaluation

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Student evaluations, such as the IDEA survey, are often used by educators to evaluate the quality of teaching. However, a student's response to each prompt on the evaluation is determined by their individual perception of the meaning of that prompt The objective of this study was to determine if perceptions of these prompts differed among students with a focus on questions involving the instructor's attempts to motivate or challenge students. To accomplish this, the IDEA survey was administered to 279 students who were instructed to rewrite each prompt in their own words. Responses were then categorized by the central theme of the prompt and counted. For every prompt pertaining to the instructor's attempts to motivate or challenge students, the students' responses were varied with the majority of responses falling into 6 different categories. This disparity between responses illustrates how divided the students are in their perception of the meaning of the prompt. This immense variation among students increases the difficulty in deciphering the meaning of an individual's response. In all of these prompts, no more than 42% of students were in agreement of any one point. Therefore, when educators use these evaluations to improve the quality of teaching, they must be aware how they interpret a certain prompt may be different from how their students interpret the prompt. Understanding where the greatest disparities exist will help educators utilize student feedback more effectively.

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Community Innovation Lab as a 21st Century Social Science Experiment Station

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Rewind…The Hatch Act of 1887 allocated federal funds to state land-grant colleges in order to create a series of agricultural experiment stations – their purpose, to educate agricultural producers about the latest innovations in practice and product through the Cooperative Extension Service. As society has shifted, so have the educational needs of today's rural and urban communities. As such, there is a growing need to explore and examine social science innovations in community education and consumer agriculture. Fast-forward to today… researchers at a southern land-grant university have established a Community Innovation Lab (CIL) to serve as a social science experiment station for the 21st Century - its purpose to explore, examine and apply educational innovations within local communities and relay the information to local, national and international communities. Members of the lab develop and examine scholarly educational innovations within communities of practice, place and interest, examples include: unique application/evaluation of community education programming, novel approaches toward enhancing cultural dynamics within the context of consumer agriculture, and pioneering advances toward international community education. As part of their mission, CIL researchers encourage reflection on educational experimentation including the documentation of successes, failures, and lessons learned, furthering the body of knowledge within the social sciences. During their presentation, CIL co-founders will discuss challenges and implications of developing a social science lab, and the role the lab plays within colleges of agriculture for the 21st Century.

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Mentoring a Brighter Future: Retaining Millennial College Students

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Millennial students are often labeled the lost generation. Improving student relationships in higher education could be as simple as facilitating an environment where students seek positive mentor relationships. Gaining an understanding of where and when students seek individual guidance

could help educators create more intentional, individualized programs specifically addressing the needs of the current generation. Students who seek personal mentorship relationships boosts campus involvement and student engagement, which in turn, improves the overall college experience. The study describes 436 first-semester students' perceptions of their personal mentorship relationships at the beginning and end of the Fall 2014 Freshmen Orientation course in the College of Agricultural Sciences and Natural Resources at Oklahoma State University. Based on a researcher-designed mentorship questionnaire, nearly one-third of students changed who they identified as their personal mentors at the beginning and end of the eight-week course. Parents were rated the most influential mentor of choice for students, and peer mentors showed the greatest percent increase in mentorship selection between the beginning and end of the class. The study yielded the following recommendations: (1) incorporate purposeful peer mentor programs within first-semester collegiate retention efforts; (2) once peer mentor programs are in place, evaluate if a relationship exists between organized mentorship efforts and freshmen retention data; and (3) target parental audiences for marketing student success and peer support efforts for recruitment endeavors. Incorporating intentional mentorship programs early in students' college experiences could be the reinforcing link allowing educators to continue building leaders in life, not just in a classroom.

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Balancing Expertise: Responsive Approach to Conservation Curriculum Development in a Secondary Agricultural Educational Setting

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High school agricultural education teachers are expected to teach a breadth of content areas in the broadly defined area of agriculture. Much of the curriculum used is either developed by the individual teacher or acquired from an outside source. In this study we describe an alternative approach that balances the predominantly *top-down* accountability-focused implementation of curriculum with the needs of secondary agricultural education teachers through a pragmatic, participatory, and methodologically responsive approach to curriculum development. We developed an experiential learning-based precision soil conservation curriculum through collaboration between four university researchers and four high school agricultural education teachers. The *responsive* approach to curriculum design focused on integration of key stakeholders' expertise; contextual sensitivity; and meaningful engagement to ensure curriculum utility and value was explored. Specifically, we sought to describe the perspectives that undergird the responsive curriculum design as perceived and experienced by the key stakeholders and examine the curriculum development processes associated with responsive design. A multi methods approach to data collection and analysis was employed. During the curriculum planning and design phase, we utilized a teachers' needs assessment; teacher training observations, retrospective questionnaire, feedback on professional development sessions; researcher debriefings and a teacher focus group after the workshop. Teacher weekly reflections were collected during curriculum implementation and a final teacher focus group was implemented after curriculum implementation. Teachers valued the responsive curriculum design process. They appreciated their role as equal curriculum design partners, took ownership of their learning and curriculum implementation, and experienced sense of purpose and meaningful engagement.

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Swapping the Bar for the Bed: Using Biofeedback as a Teaching Method for Developing Professional Resilience and Readiness in College Students

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College seniors indicate an increased amount of stressors resulting from the job search and transition resulting from impending graduation.

Stress can negatively impact performance, especially in students with maladaptive coping behaviors. In a major-required senior-level course, five students were asked to wear heart rate monitors for five days and followed up one-on-one with the instructor for a feedback session including personalized report or result. Strategies to increase recovery and reduce stress were discussed for personal implementation. Heart rate monitors were then worn for another five-day period followed with a final feedback session and report of results. This experience resulted in three of the five students showing a dramatic increase in recovery as indicated by parasympathetic system activation at a higher level than sympathetic activation. Sleep patterns were positively impacted in all five of the students with significant behavioral and physiological differences also described by the students. Students described choosing to stay home and go to bed to ensure optimal sleep length over accepting invitations to go out for drinks with friends. Some students limited pre-bed use of devices with glowing electronic screens or swapped screen time for reading a book. They attributed these positive behavioral changes to the impact that their behaviors had on sleep, recovery, and stress responses made apparent by heart rate monitor data. It is believed the integration of biofeedback in major-based college courses could increase student performance and readiness for being more effective, resilient professionals.

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Describing Agricultural Discipline Specific Signature Pedagogies

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Colleges of Agriculture will need to embrace their critical role in addressing challenges in food security, food safety, climate change, environmental stewardship, renewable energy and human health to meet the needs of the growing world population. Action has been taken to address national concerns in agricultural education by stressing the importance of focusing energy on improving the undergraduate experience to produce flexible, well-prepared graduates that are appropriately skilled, socially responsive, and technically proficient for the agricultural industry.

Signature pedagogies are the types of teaching that organize the fundamental ways in which future practitioners are educated for their new profession. The concept is important in that it implicitly defines what counts as knowledge as a field and how things become known. The purpose of the research study is to take a deeper look into agricultural disciplines' specific approach to teaching and learning. The research study will allow for researchers to better understand how university academics learn to teach to improve post-secondary agriculture education. The qualitative study was descriptive in nature with the intent of providing a detailed account of award winning faculty's perception of their respective discipline's specific pedagogical practices. This research will focus on describing the surface structure of nine award-winning faculties' perceived signature pedagogy in a College of Agricultural Sciences. Each of the nine faculty provided an operationalization of their instructional pedagogy and their perceived discipline's specific signature pedagogy. Discipline specific signature pedagogies identified included problem-based learning, project-based learning, virtual field experiences and case studies.

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Increasing the Utility Value of Lab Reports in a College Biology Course

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Science writing, such as lab reports, allow students to extend meaningful understanding of scientific concepts. However, students often view writing tasks as unimportant and utilize surface level approaches when completing writing assignments. The purpose of the study was to remediate deficits in motivation and performance of students on lab reports through the use of a utility value based intervention. Aligned with prior literature, two methods for improving the utility value of lab reports (videos and reflective writing) were incorporated into a quasi-experimental design with 43 sections of an introductory college biology laboratory (n=1014). The 2x2 design included four randomly assigned groups (video, writing, video/writing, and control) each with five interventions over the course of the semester. Motiva-

tional measures (interest, utility value) were collected pre/mid/post-intervention, while lab reports and final lab grade were used as measures of performance. Controlling for initial interest, a repeated measure ANCOVA found time by condition differences between groups ($p < 0.05$), with all experimental treatments reporting higher lab report utility value than the control. Interest in writing lab reports was statistically higher by the end of the treatment for the "writing" intervention compared to the control, however, there were no observed differences in performance on lab reports, or final lab grade. Results suggest a reflective writing task that engages students with the practical application of lab reports can be an effective method for increasing student motivation in scientific writing. Further research is needed to unpack the effects of the intervention on student performance.

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Generation Us: Teaching Methods

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Defining who the current college students are and their generational characteristics will assist faculty in the development of innovative teaching approaches to ensure course outcomes are met. This generation of students are digital natives, spend more time working, communicate differently and are skilled social networkers. Strategies that have proven successful in educating current students include utilizing a variety of technologies while incorporating face-to-face interaction, clearly stating classroom rules and expectations, rethinking modes of communication and understanding generational motivators. Innovative teaching approaches that have proven successful are incorporating active learning, evolving case studies, using multiple communication strategies, and utilizing pop culture to teach. Understanding and acknowledging the differences in today's students is the first step in creating classroom strategies and designs that meet the needs of this unique group.

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Service Knowledge Gained from Service Learning in an Undergraduate Sales Class

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Many agricultural students engage in service activities as undergraduates. The benefits of these activities are well-researched. This case study focuses on the addition of a service learning component to an advanced undergraduate sales class in a manner consistent with Kolb's 1984 suggestion that effective learning requires concrete experiences, reflective observation, abstract conceptualization and active experimentation. Twenty-six students who had previously completed an introductory sales course were asked to apply their skills in fundraising for a community organization. Students were trained on the contributions of the organization and the need in the community. Each student prepared a sales presentation, evaluated themselves and others, and made refinements to their presentation. In pairs, they were assigned to set appointments with business owners, present the need for support, and ask for a contribution. Awareness and attitudes about the community organization were measured before and after the experience, along with attitudes about the experience itself. Students experienced real world challenges and successes. Results showed that organization awareness and knowledge of the sales process were enhanced through the experience, which was viewed positively by students in their individual reflections. Educators wishing to incorporate this experience should be aware of the need for training and helping students anticipate situations they will encounter.

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An Evaluation of the Implementation and Use of College-Level Standards in Undergraduate Research in a College of Agricultural and Life Sciences

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Previous work demonstrated that undergraduate research was not assessed for knowledge and

skill gains. The aim of this study was to evaluate the implementation of a 0-credit research course with a standardized syllabus and assessed as satisfactory/unsatisfactory (S/U), in the College of Agricultural and Life Sciences (CALS), University of Florida. In spring 2015, identified students (n=203) were contacted and 49 (24%) (35F,10M) completed a survey through Qualtrics®. Faculty from CALS (n=30), who supervised undergraduate research for credit, also completed an online survey. Students reported being familiar with the 0-credit option (78%). Few students received a syllabus; however, they met with their research advisor or were informed of the expectations (91%). Students *agreed* or *strongly agreed* that they were more likely to participate in research with a 0-credit option (58%) and that having "research" on their transcript is important (89%), but only 47% agreed that research should be evaluated as S/U. Most faculty (75%) did not distribute a syllabus and some were unaware that a template syllabus existed (38%); however, those who did, used the CALS template (67%). Faculty *agreed* or *strongly agreed* to future use of the template (38%), that undergraduate students are more accountable when registered for research credit versus volunteering (73%), and that research credit should be evaluated as S/U (54%). Results suggest that students and faculty are in agreement that a 0-credit research option is advantageous, although additional steps are needed to ensure the template is made available to students registered for research in CALS.

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Not Just Another Webinar: Innovation in Online Professional Development

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While professional development is vital to the advancement of success of faculty and students in teaching and learning, financial resources available to support professional development activities as well as flexibility of schedules to allow for travel is limited. Thus, to accomplish the mission creating a space for innovation and collaboration in developing global learning opportunities throughout the K-20 education continuum, the Global Learning in Agriculture Conference was held in an online environment for the first time. An online format allowed over one hundred individuals from 26 states and three nations to engage in a convenient and affordable way. While online events often feature one-way communication, the Global Teach Ag! team at Penn State University explored innovative practices to engage participants in the topic of global learning in agriculture. Registration included a "Conference in a Box" containing some of the items that are often part of a face-to-face conference including educational resources, a conference t-shirt and water bottle, select materials and information from conference vendors, and international snacks. The conference featured a keynote speaker, as well as eight different presentations with speakers from around the nation and two other countries. Twitter was used as a way to facilitate robust back-channel communication among participants and the use of this method of communication was encouraged through a Twitter contest. Conference evaluations evidenced participants gained new insights and ideas related to global learning in agriculture, while forging new collaborations. Best practices and approaches translatable to other contexts will be shared.

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Cultivating Graduate Student Success: Integrating Natural and Social Sciences to Promote Interdisciplinary Research and Teaching

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Solutions to the world's most pressing problems, such as global food security or climate change will not be adequately addressed by a single discipline. Interdisciplinary research has long been recognized as accelerating scientific discovery and may hold the key to creating sustainable solutions to global issues. While the skill to manage interdisciplinary collaborations is often lauded as important, it is rarely the focus of traditional graduate education. The International Agriculture and Development (INTAD) dual-title degree program at Penn State University features a capstone course that offers students the opportunity to engage in interdisciplinary research, while also de-

veloping other skills such as grant writing. The semester-long course is co-taught by faculty members representing both the social and natural sciences, and is populated by students enrolled in the INTAD dual-title program, also representing the social and natural sciences in the College of Agricultural Sciences. During the semester, interdisciplinary student teams lead class sessions focused on unraveling a current agricultural issue from the point of view of both the natural and social sciences. Additionally, interdisciplinary student teams further develop collaboration skills by writing a grant proposal in response to a real-life request for application. The course promotes an atmosphere of mutual respect for each discipline, as well as acknowledgement of the contributions that each discipline can make to finding solutions for complex problems. Student feedback provides evidence that this is a challenging course that provides an opportunity to develop important interdisciplinary collaboration skills not taught elsewhere.

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Student Recruitment: What Is It That REALLY Makes Them Say "Yes!"?

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Multiple research studies have examined the factors that affect a student's choice of a university. Facing a drastic reduction to the department's recruiting budget, researchers sought to identify those activities that had the greatest return on investment, which would then guide future recruiting efforts. Beginning freshmen and first-semester transfer students were asked to identify the single most significant factor that made them say "yes" to the university. They were asked to further identify five other major factors influencing their decision. Surveys were distributed in entry-level agriculture classes within the first two weeks of the Fall 2015 semester. Responses were received from 117 transfer students and 109 beginning freshmen. The highest percentage (20.88%) of responses for the "single most important factor" was provided for "I liked a specific program of study or major". Of the other 27 possible responses, no other response exceeded 10%. When asked to identify five "other important factors", almost two-thirds (64.66%) cited "I like a

specific program of study or major". "I liked the size of the campus" received the second most responses (56.63%), followed by "close to home" (53.01%), and "cost was cheaper compared to other universities" (51.00%). No other possible response exceeded a 50% response rate; however, logistic regression revealed that freshmen students more frequently cited "I attended an FFA or 4-H event on campus" as an important factor (p<0.05), and the "reputation of the department" was more influential for Caucasian students than African American (p<0.10) and Hispanic (p<0.05) students.

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Building Professional Learning Networks Through Social Media: #TeachAgChat

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Twitter, a social media platform, provides opportunity for inclusively connecting geographically disparate individuals for productive dialogue. When developing members of an agricultural profession, opportunity to expand professional networks and engage in conversation on critical issues is advantageous to career success. #TeachAgChat was organized in 2015 by agricultural teacher candidates to fulfill an assignment in an undergraduate methods of teaching agriculture course. Utilizing a hashtag to organize a discussion group around a topic or discipline to occur on a regular real-time basis is common practice with #AgChat perhaps being most recognizable in the agriculture industry. Multitudes of other chats are organized around different educational subject areas, but one did not exist for agricultural education; thus, presenting an opportunity for student development and professional service. Data from distinct chat sessions facilitated by teacher candidates was gathered using advanced social media monitoring software Sysomos. Analysis of the tweets, including users, overall number of tweets, level and type of participation was conducted using MaxQDA. Teacher candidates facilitated five chats on specific topics that engaged a total of 159 unique users who shared 2020 tweets. Preliminary data analysis shows a rise in the number

of individuals participating and an increase in the number of tweets between the first chat session and the last chat session. #TeachAgChat continues beyond the single classroom assignment with different stakeholder groups hosting regular bi-weekly chats. Best practices for integration were collected from participant interviews. Future research on participant growth in digital citizenship and level of professional identity/connection is anticipated.

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Incorporating the Smartphone as a Teaching Tool for Agronomic Education

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In agronomy classes, students are introduced to many concepts that have application in their future careers. With the widespread adoption of electronic media, unlimited information is available to both students and practicing agronomists within a touch of their smartphone screen. The objectives of this study were to evaluate how access to electronic media influences students' approach to learning, examine their expectations for using electronic devices in their education and careers, and assess use of smartphone assignments as a teaching tool. In a 2015 survey, juniors and seniors in agronomy at Kansas State University strongly indicated a desire to spend study time gaining a true understanding of concepts rather than relying on short-term memory for exams. However, about a third of respondents reported that easy access to information through electronic media encouraged short-term memory versus deeper understanding. Nearly half indicated that if working as a consultant in the future, they will more likely source the answer to a client's question from a handheld device than from their prior understanding of the topic. Over 70% indicated that the application of handheld devices should be incorporated into classroom experiences and assessment. Separate surveys revealed that 99% of students recently enrolled in the introductory crop science class have smartphones, so assignments were developed to incorporate smartphone use. Assignments included taking photos for botany labs, using agronomic applications on field trips, and facilitating mathematical calculations on problem solving exams. In course evaluations, over 75% of students

rated smartphone assignments "valuable" or "highly valuable" learning tools.

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Advantages and Challenges in Academic Advising Approaches Utilized by Various Size Agricultural Universities

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Retention of students continues to be an important issue for universities especially as many state appropriations for higher education shrink. Effective advisement is an essential component of the overall student experience at a university. Academic advising of students begins prior to the first university course session and continues through each semester until the student graduates with a degree. Approaches taken by agricultural universities to provide this advising may be quite different among institutions with different enrollment sizes and organizational structures. Faculty and students at three institutions with undergraduate agriculture economics degree programs were surveyed to identify the advising approach used by the institution and the faculty/student perceptions of its strengths and weaknesses. The respective institutions were a fully open admissions public state university with total enrollment of 3,000 to 4,000 students and agriculture enrollment under 200 students, a regional public state university with total enrollment of 6,000 to 8,000 students and agriculture enrollment of approximately 700, and a state land grant university with total enrollment of 21,000 to 22,000 students and agriculture enrollment of approximately 2,800. Each approach was evaluated by number of students graduating within six years of initial enrollment, annual student progress toward a degree, and faculty/student subjective ratings of their respective advising approach. Findings showed that fundamental differences among the programs exist with respect to the average number of advisees, training for advisors, reporting requirements, and perceived importance of

advising to annual performance evaluations. Student responses indicated that advising was effective and meaningful.

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A BRIDGE Program to Engage, Sustain and Empower Women and Minorities in STEM

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A BRIDGE program was created in which students and faculty in a university have partnered with local industry to recruit and create interest in STEM fields for students in rural areas with limited access to technological equipment and human-based technical expertise. By establishing this system, students learn about STEM-related careers from university students, faculty and industry experts. Rural area high school students ask their questions during these visits, and are able to ask questions anytime by using a web-based support system. Another area of the program focuses on a university retention and development program, which creates scholarships to ease student financial burden. This allows students to focus on their education, creates a better learning environment, and enables students to achieve better grades. The final step creates an internship program that provides students with opportunities for financial support as well as the opportunity to learn valuable technical skills and responsibility by being part of a team. The program also creates a teaching assistantship program to financially assist students and teach leadership skills. The BRIDGE program creates a strong relationship between rural area high schools and industry with the help of the university. The program is scalable and adaptable to other fields of study.

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Perceptions of a Diverse Student Population on Animal Agriculture

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The university honors program offers courses titled "Difficult Dialogues" which are upper-level discussion courses solely for students enrolled in the honors program. Animal science faculty taught a section on animal agriculture within a course on animal rights and animal welfare. Topics covered throughout the semester included animal rights and welfare, food animal production, animals in research, and animals used for entertainment purposes. Other university faculty taught the other portions of this course. This group of faculty included vegans and promoters of animal rights. Students (n=15) were asked to compose a reflection titled "Animal Agriculture as I See It and Feel It" prior to and again at the completion of the course. These reflection essays were analyzed using NVivo, a qualitative data analysis software program. Reflections prior to the course revealed 80% of the students had limited/no knowledge of animal agriculture, 20% had an agricultural background, 13% had a negative view of animal agriculture, and 6% abstained from eating meat. Student reflections following the course revealed that 87% of students had a positive perception of animal agriculture while 13% said they would decrease or abstain from eating meat. All students indicated that they were much more informed on animal agriculture. Students also voiced the importance of animal welfare, but disagreed with animal rights and the way animal rights groups and the media often portray animal agriculture. These results illustrate the disconnect between the general public and agriculture and highlight the need for education of the public on agricultural animal production.

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Cultivating Solar Energy Experiences: Evaluation of a Hands-on Workshop

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The expanding solar industry provides opportunities for system marketing and sales, system design, research, and system installation, operation, and maintenance. Several challenges exist for integrating renewable energy into the agricultural education curriculum: technical training for the instructor, funding (for materials and technical training), student engagement, relevancy to existing curriculum, and sustainability to continue the effort. A solar energy systems workshop was conducted for workshop attendees participating in a week-long renewable energy conference hosted by a Midwest land grant University in July 2015. Twenty individuals selected to attend the conference participated in the scheduled half-day workshop. Attendees were asked to complete a pre-workshop online survey developed to address previous solar attitude, knowledge, and perceptions before the conference. Each individual received a bound copy of the power point presentations, viewed demonstrations of solar-powered water pumping systems, used multimeters to measure system voltage and amperage, a pyranometer to measure solar irradiance, and assembled five-gallon solar fountains (20-watt PV module, DC bilge pump, PV cable, PVC pipe & fittings) using professional-grade tools to build and attach PV cables and connectors to their solar modules, and setup and test their systems. A workshop evaluation (open-ended questions, and five-point rating scale) was administered at the conclusion. Findings revealed: "the workshop was well organized" (4.85/5.0); "content was complete" (4.84/5); "addressed expected concepts" (5.0/5.0); participants "became more competent in this area" (4.76/5.0); "hands-on component fit the workshop objectives" (5.0/5.0); "I can make use of the materials" (5.0/5.0); "I would attend another workshop related to this topic" (5.0/5.0).

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Teaching Apparel Construction in a Flipped Classroom

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For a field of study to remain relevant and progressive, it is crucial that its curriculum and instructional delivery methods are consistently evaluated and revised to meet the needs of its students. To effectively engage today's students, educators in the field of Apparel and Textiles are shifting away from traditional teaching to developing innovative ways to facilitate teaching and learning. The purpose of this study is to compare the effectiveness of teaching sewing techniques, specifically dart construction, to students through flipped instruction, a blended learning model whereby lecture content is accessed outside of class through online resources allowing more time in class for discussion or hands-on activities, versus traditional teaching methods. The participants of this study are 30 students enrolled in a fashion design program at a community college in the Mid-Atlantic region of the United States. Half of the participants were taught through flipped instruction and were provided with instructional videos accessible through an online learning management system. The other half received traditional classroom instruction. Both groups used the sewing lab to construct their darts. Experienced sewers judged the quality of the participant's dart construction in a blind review. Ratings for the quality of dart construction had a total possible score of 5. Regression was used to analyze the data. The mean score for the flipped instruction group was 5 and the mean score for the traditional instruction group was 4.81. The results of this study show that flipped instruction is an effective method for teaching apparel construction techniques.

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Enhancing Student Learning: Exploring the Potential of Flipped Classrooms

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Curriculum in flipped courses is organized so that students work on content acquisition (knowledge and understanding) by themselves, and classroom time is devoted to active learning and highly interactive experiences focused on enhancing higher order thinking skills (analysis, evaluation, and synthesis). This study compared two Spring 2015 sections of the same course, Reflections on Fighting Hunger, with 51 and 53 students respectively, where lessons were taught differently (flipped or traditional) in each of the sections. Additional data was collected from improved versions of the course in the following two semesters. Quantitative and qualitative data included

student grades, course evaluations, content analysis of student essays and papers, a learning reflection research instrument, team debriefings, focus groups, and interviews. Key findings included: 1) Students participating in the flipped lessons with pre-class assignments, accountability measures, and in-class activities, showed more active learning, and demonstrated better content acquisition and higher order learning skills in the final exam questions for these lessons; 2) most useful and impactful pre-class assignment accountability measures were those including creative questions (rather than just content questions); 3) students resisted change, and struggled to accept additional pre-class assignments; 4) student resistance to work in teams is a threat to the success of a flipped classroom, and should be addressed throughout the semester; 5) instructor flexibility, while important in the flipped classroom, is met with wariness by students; and 6) to best benefit from the flipped classroom, students first need to learn lesson dynamics and processes, so consistency is key.

355

Assessing the Potential for Establishing 4-H in Belize to Preserve Agricultural Indigenous Knowledge and Practices

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In many countries throughout Central America, youth participation in crime and violence is a concerning issue. In the case of Belize, this is influenced by the lack of youth organizations or programs. Because agricultural education programs are not available for young people, many community leaders also fear a loss of indigenous knowledge and local agricultural practices. This undergraduate student research investigates the potential for the creation of a 4-H program to address this problem. In the United States, the 4-H program is a youth development and mentoring organization first started by the U.S. Department of Agriculture. The 4-H model has spread to over 50 countries and has affected over six million young adults worldwide. This research helps to determine the needs of the San Jose Succotz community in the Cayo District in Belize and the potential benefits of establishing a 4-H program.

Building on previous undergraduate research that identified the agricultural practices in place in these villages, interviews with current 4-H leaders, in-country community leaders, and students were conducted. The purpose of these interviews was to inform how a 4-H youth development program could be adapted to fit the cultural context. The goals of implementing the 4-H program would be to preserve the indigenous knowledge in the local community, develop career options in agriculture, and continue to grow the agricultural sector in the area. The results of the interviews indicate that establishing a 4-H program is not only possible but should be implemented immediately.

360

Describing Perceptions of Preparedness Among Agriscience Educators Entering 21st Century, Global, Learning Environments

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The purpose of this study was to describe perceptions of preparedness among agriscience pre-service teachers entering 21st century global learning environments. The descriptive design was guided by research objectives: describe undergraduate multicultural experiences of in-service agriscience teachers; describe the teachers' applications of multicultural training in their current education environments; describe teachers' cultural preparedness to enter and work in multicultural education environments; and describe in-service teacher-suggested modifications to the pre-service curriculum experiences. Phase one of this longitudinal study, consisted of pre-service and in-service agriscience teachers. Undergraduates who completed their BS in AgriScience Education at The Ohio State University in 2015 are the initial participants (N=10). Data were collected using pre-service field observations, focus groups, personal interviews, and written response questionnaires. During the focus group, students identified several sources of their undergraduate cultural competency training, but three participants voluntarily mentioned attending training to branch out and become a more *well-rounded* individual. All participants agreed that differentiation of instruction was important for

classroom inclusion of underrepresented populations, but only one example of differentiation, relating the content back to the student's interests, was evidenced. Additional graduates, will continue to be examined for emerging trends related to the objectives of this study. These trends will be analyzed for updating curriculum and for continued improvement of practices that prepare pre-service teachers. In addition, data will be used for providing in-service education to agriscience teachers for reaching learners in 21st century global environments.

361

Engaging Agriculture Students in Reflective Discourse Around Intercultural Communication: Approaches and Outcomes

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Issues in agriculture are global and developing knowledge to address them in a world that is changing at an accelerating rate is a challenge for both educators and students. People from vastly different cultures are working together to address concerns such as climate change, food security, and natural resource use, introducing diverse worldviews, values, and identities to the problem-solving sphere. Adult learners must develop the capacity to reflect critically on the lenses we use to interpret and engage in the world through reflective discourse. This is best developed when participants are well informed, listen actively, have equal opportunities to participate, and take a critical stance toward established cultural norms or viewpoints. If students are provided opportunities to engage in this critical analysis of their assumptions, how do we assess where they are in the process? At a land grant institution in the Southeast, a course entitled Intercultural Communication provides a space for learners to collaboratively engage in the assessment of their knowledge-making process. This presentation will address the teaching methods used to engage students in reflective discourse and share both quantitative and qualitative measures of their attitudes and personal transformations in thinking. Examples of teaching methods include: classroom community building, small group discussion and scenario planning, individual reflection, and case study analysis. Quantitative and

qualitative data were collected through a questionnaire and individual reflection papers respectively. Through methods of reflective discourse, students in Colleges of Agriculture will be better prepared to face the challenges of a multicultural world and workforce.

365

Teaching Healthy Lifestyles and Science to Youth by Building and Cooking from World-Regions Gardens

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Teens and their college-aged mentors learned healthy eating (and numerous other skills) by building and cooking from "regions of the world" gardens on the UHM campus. First, they researched the indigenous and introduced plants of 10 world regions, as well as traditional and contemporary recipes. From this they made plant lists. They built raised bed gardens, amended the soil, set up irrigation and pest management systems, seeded and transplanted vegetables and fruits, built garden-design features (benches, trellises, pots), and made recipe signs for each of these regions: 1) the Middle East; 2) the Mediterranean; 3) India; 4) East Asia (China, Japan, Korea); 5) South-East Asia; 5) Central Asia (the Steppes); 6) Europe (Western, Northern, Central, and Eastern); 7) (Indigenous) South America; 8) (Indigenous) Central America; 9) (Indigenous) North America; and, 10) (Indigenous) West Africa. Each week teens and mentors harvested and cooked full meals from the vegetables of one region. They analyzed the nutrient content of the meal and reviewed indigenous and introduced vegetables and fruits for the region. They studied the history and cultural aspects of food, cooking and garden design for each region. Youth and parent questionnaires revealed statistically significant improvements in: parents' and teen's eating habits, understanding of healthy foods, hands-on skills in carpentry, farming and cooking, cooperation in gardening and cooking as a family, interest in learning science, nutrition and geography, intent to attend college and attitudes toward healthy and earth-friendly, life-styles.

367

Assessing the Impact of Vertical Alignment Professional Learning Communities in Improving Teacher Instructional Approaches

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Establishing vertically aligned professional learning communities (VPLCs) is a valuable approach to building stronger collaborative relationships between educators in an effort to increase teacher content knowledge and improve teacher instructional methods while preparing students for graduation with a focus on Science, Technology, Engineering, and Mathematics (STEM) careers, applications, and innovations. Data from K-12 schools in one "County" showed math and science courses in grades 7-10 posed the greatest challenge for their students. The "County" School District partnered with the University of Georgia in Project CATAPULT TEAMS (Connecting and Aligning Teaching, Assessment, and Project-Based Understanding for Learners in the Twenty-First Century: Teachers Empowering All Math and Science students). System-wide vertical alignment focused on aligning curriculum, assessment, and instruction across grade levels to increase the rigor of learning for all students. The VPLC model provided a framework for all 77 middle and high school math and science teachers in the seven schools of the system to participate in professional development, and collaboratively analyze and improve curriculum to develop a continuum of skill building from one grade level to the next, while sharing teaching methods and lesson plans. Evaluation questionnaires were administered and collected at the end of the two project years (n=68, n=41). The quantitative and qualitative data from these instruments show strong positive responses from teachers for the use of vertical alignment as an approach to successfully collaborate with other teachers, prepare students for more advanced courses, monitor student success, design lessons, and be more purposeful in course design and implementation.

370

Utilizing Social Network Analysis in a Team-Based Learning Formatted Capstone Course

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Teacher-centered instruction, such as lecturing, still dominates the higher education landscape. This is disconcerting given the sound research base on how students learn and the desired traits they should possess as they enter the workforce. Employers are searching for well-rounded graduates who can communicate effectively, and work in teams to create solutions to complex problems. Limited literature exists regarding measuring collaboration in capstone courses. More specifically, no known literature exists for measuring student collaboration in a capstone course taught in a team-based learning format. Social Network Analysis (SNA) was chosen to measure collaboration efforts among all students enrolled in AgEdS 450 during the fall 2015 term (N = 61). The researcher created instrument was administered at the beginning, midpoint, and end of the semester. Surveys from each time point were collected and yielded a 100% response rate. Data were analyzed in UCINET, a statistical and graphic software package for SNA. The average degree for the whole network increased from 12.34 in round one to 21.41 in round three. The average distance between students measured in round one was 1.92 compared to 1.64 in round three. The results show that over the course of the semester, student collaboration increased drastically which could be attributed to the course design. Present results support the notion that team-based learning develops cohesive teams who work collaboratively throughout the semester, and have the ability to disseminate information or resources in an effective manner. Future studies could compare network measures to performance to investigate potential intervention relationships.

371

Should Social Media Education be a Part of the Agronomy Curriculum?

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Social media sources have rapidly become a leading source of information in both social and professional arenas. In a recent survey, Kansas State University agronomy alumni indicated that their curriculum did a very poor job of preparing them to utilize social media in a professional setting. In response, an experimental component was developed for the fall 2105 agronomy orientation class to assess students' perception of Twitter and to facilitate the engagement of students in Twitter as a source of agronomy-related information. The goal was to better prepare students for using social media in the career setting. All students in orientation class were required to obtain a profile. Two surveys were given: 1) to assess students' initial perception of Twitter 2) to assess their perception after a series of assignments that facilitated active following of agronomy-based profiles on Twitter. Initially, students indicated that only 19% of the Tweets in their newsfeed were agronomy related, and the majority of students indicated that Twitter was not a useful source of agronomy information. After the assignments were completed, students were asked to re-evaluate their newsfeeds. In the second survey, an average of 30% of the Tweets in their newsfeeds were agronomy related. A majority now indicated that Twitter was a useful source of agronomy information, and that they would expand the use of Twitter to source career-related information. The results of this study suggest that social media education should be further integrated into existing curricula to reflect its actual use in the career setting.

372

Implementation of Agroecology Summer Institutes for Secondary Teachers in South Texas

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This presentation provides details about the content, activities, and field trips included in agroecology summer institutes provided to forty South Texas secondary school teachers from fourteen school districts in 2014 and 2015. South Texas has one of the highest obesity and diabetes rates in the country and ranks last in the percentage of the state population that eats vegetables regularly, yet it is one the agriculturally richest areas in Texas. Furthermore, invasive species and recent urban development threaten the sustainability of local agricultural efforts. Grant funds awarded from the National Institute of Food and Agriculture were used to increase teachers' awareness of agroecology concepts and research, one component of the university's Curriculum Development, Experiential Learning, Networking, and Agroecology for a diverse clientele in South Texas (CENA) program. The institutes provided hands-on activities related to plant science, local crops and organic farming; included field trips to local USDA and university agricultural research facilities; and offered networking opportunities to inform participants about other agriculture-related opportunities for educators and students. Teacher participants reported that they incorporated the local issues and concepts into their schools' secondary science curriculum. The number of teacher applicants increased dramatically from year one to year two, and a third institute is planned for 2016. The CENA summer institutes provided a mechanism to improve agricultural education in South Texas and create a high school-college-career pipeline for Hispanic students in the agroecological and food related sciences, including participation in our Hispanic-Serving Institution's research internships and undergraduate and graduate environmental sciences programs.

373

Improving Student Success Through the Undergraduate Advising Experience

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The Purdue College of Agriculture has often heard comments from its undergraduate students that the advising is "better than experienced elsewhere." This is consistent with a recent (Jan. 2016) Purdue Office of Institutional Research, As-

sessment, and Effectiveness report which indicated: "The college with the highest satisfaction in all categories of advising (college level, departmental staff, and faculty) is the College of Agriculture." To explore the positive aspects of the College's advising structure, as well as address areas of improvement for undergraduate academic advising in the Purdue College of Agriculture, a series of meetings were held. The first sessions collected feedback and some data from 26 faculty and staff involved with undergraduate advising. After these discussions, two student sessions followed to receive comments on current advising structure and function. This presentation will 1) inform individuals of the observations from the faculty, staff, and student sessions and 2) share alternative advising structures, ideas for improved effectiveness and efficiency of information dissemination, and strategies for motivating and guiding students toward lifelong success. The observations gathered from these sessions confirmed what was already known about advising as well as provided new insights; namely, that guiding students through academic pursuits toward a solid career launch should involve a team effort of both professional staff advisors and mentoring faculty. In any team environment, communication and structure is critical; by improving both communication and structure, advisors should see an improved student understanding and experience.

375

A Novel Approach to Teach Sustainable Animal Breeding and Genetics Practices to Undergraduates in the Animal Sciences

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A thorough understanding of genetic selection and mating systems is critical to facilitate genetic improvement in livestock production, and these principles are a seminal part of animal breeding and genetics curricula in the animal sciences. While many proven pedagogical approaches are available to teach these basic principles regarding economically relevant traits (ERT) to students, those methodologies operate under the assumption that maximizing genetic improvement is achieved by reaching the greatest phenotypic levels of production for growth, maternal and carcass traits. For quantitative traits, every unit of output requires an input cost, so it is important to match the genetic potential for ERTs to the production environment and availability of feed resources in which livestock are raised. Cattle are reared in a variety of production environments such that sustainable genetic improvement cannot be achieved with a one-size-fits-all approach. The project herein implements the use of a computer-based simulation program to serve as a teaching aid of holistic breeding concepts important for sustainable genetic improvement. The program was used in individual and group problem-solving activities where students compare, contrast and model the contributions of mature size, feed costs, climate conditions and current levels of ERTs as they relate to the economic ramifications of selection strategies in a variety of real-world scenarios. Results of quantitative assessment and evaluations indicates that the program: (1) was useful for decision support, (2) helped facilitate a deep understanding of animal breeding and genetics principles, and (3) created a positive learning experience for students.

381

Building Relationships and Trust Between the Local Community and STEM Professionals

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Mary Lou Madden
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In rural Alaska, for many reasons, residents often have a mistrust of western science and have gained an understanding of the natural world from a placed-based perspective across generations. These Alaskan residents are closely tied to their land and seascape while living at least a partial subsistence lifestyle. Their perception of western science is poor because of the unfamiliarity of what a scientist does and how science influences their lives. To overcome these perceptions, two programs, Sitka WhaleFest (SWF) and Scientists in the Schools (SIS), have operated for nearly 20 years in Sitka, Alaska, a small community perched on the edge of the Gulf of Alaska. The goal is to bring science into the everyday lives of

rural Alaskan residents and for students to gain an understanding of the career pathways available in science. Evaluation and assessment occurred in grades 4, 8 and 10 state-wide using standardized testing in science and My Attitudes Towards Science. Sitka students consistently scored above the state average for these grade levels. The successes of both SIS and SWF can be attributed to programs specifically designed and tailored to the community and residents of Sitka. Future directions include expanding SIS state-wide and SWF has begun a step-wise mentoring program where each successive grade mentors the grade lower helping students understand the career pathways available in science.

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Classroom Level Student Engagement in a Team-Based Learning Formatted Course

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Teacher-centered instruction has been found to be ineffective for today's diverse student populations. Engaging students in a didactic lecture-based course is often difficult to achieve, yet many courses emphasize the didactic lecture method of teaching. Active learning is gaining in popularity throughout all levels of education, and particularly at the post-secondary level. Students need to be involved in the learning process versus passively receiving large amounts of information. Active learning practices, such as Team-Based Learning (TBL), have documented benefits including increased critical thinking skills, higher performance, and increased engagement within the learning environment. The purpose of this study was to examine student reported engagement compared to instructor rated importance of specific engagement activities. This study utilized the classroom-level adaptation of the National Survey of Student Engagement known as the CLASSE. The CLASSE was administered to all students (N = 61) as well as the instructor (N = 1) in AgEdS 450 at the end of the fall 2015 semester. Fifty-four usable student instruments were returned, yielding an 88% response rate. Data were analyzed using SPSS 19.0. The frequency of activities students reported being frequently engaged in included synthesizing and applying concepts to solve problems within teams, asking questions, and discussing important topics; all of which were rated as important for student success by the instructor. The researchers conclude that the TBL method is effective for student engagement within the learning environment. Future studies could compare data to national norms to develop an engagement benchmark.

383

Cultivating Student Success Using Interactive Web Tools

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This presentation will provide an overview of two examples of using interactive web tools to support student success: poultry carcass grading videos and Google Forms. Reasons for selecting these tools, how the tools are implemented and student reactions will be shared. Video clips of sample poultry carcasses were created to allow members of the poultry evaluation team more opportunities to practice grading. Videos showed views needed to identify defects including broken/disjointed bones, exposed flesh and missing parts. From these views students determine the final grade of each carcass. Videos were recorded using an iPad and enhanced to provide an interactive experience where students identify defects and final carcass grades before viewing answers. Videos supplement judging practices by providing additional time to interact with the content. After viewing the answers, students can go back and review the video. Google Forms were used to facilitate student sharing of links and reviews while learning to use instructional technology. The form was embedded into the course learning management system directly following the activity instructions. Students entered the link to their project or the content of their review into the form. A link providing access to view the Google Sheet was also provided. Students could then view the reviews submitted by their peers and access the links for projects, but could not change any of the information in the sheet. Both of these examples harness the power of web tools to support student success through increased interaction with key content for the contest or course.

384

Enhancing Student Learning in the Hawaii Agdiscovery Program

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The Hawaii AgDiscovery Program (HADP) is a cooperative initiative between the United States Department of Agriculture: Animal and Plant Health Inspection Service (APHIS) and the College of Tropical Agriculture and Human Resources at UHM. The goal is to provide a rigorous two-week academic program where students explore a diversity of agricultural careers while preparing them for college life through on-campus living. Ten high school students, ages 14-17, were selected from dozens of applicants nationwide in July of 2015 to participate. One of the greatest challenges was developing a student project that was both fun and engaging for students which also cohesively integrated the knowledge gained from presentations, field trips, and hands-on activities during the short two weeks. In conducting "The Amazing HADP Race", a mock version of the television series, students were able to execute critical thinking and problem solving, reflect on their experiences, apply real world skills, and practice team work. By competing in various challenges designed to frequently test student knowledge, participants were observed by university professors, agricultural experts, and APHIS professionals to be more interactive during sessions and exhibit greater knowledge retention than previous years. The student led video utilized an array of technology, a medium with which many students excel. The video has been used as evidence of student learning and program value. Student evaluations rated the mock race at 90% for strengthening communication, teamwork skills, in helping with their future. Overall, evaluations also revealed an 88% satisfaction rating with the program.

388

Do We Still Believe in the Power of Knowledge?

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Stephen Devadoss
University of Idaho, Moscow, ID

Knowledge has always been a core principle for the strength of nations and their prosperity. Teachers who play the role of mediators between the knowledge as an object and a student as a subject. Teachers are long believed to be a central factor in student learning in the classroom and consistently seek reassurance in their passion of teaching. In our study we examine how students view higher education and, most importantly, whether college students value the gaining relevant knowledge and skills as a single-most important lifetime investment. The survey will be used to gather data regarding students' perception of the importance of knowledge. We will administer survey to undergraduate students at three different locations: University of Connecticut, Eastern Connecticut State University, and University of Idaho. We will use the survey findings to help us, teachers as valuable producers of knowledge, better understand the needs of our students, co-producers of knowledge and education.

392

Global Perspectives Certificate Program: Assessment Using a Faculty Development Rubric

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The Global Perspectives Certificate (GPC) Program works to enhance global engagement at home and abroad and to enhance student academic success by integrating global perspectives and internationally engaged learning experiences into programs on campus and abroad. High impact activities contribute to student success. To assess the impact of the GPC program, an interdisciplinary faculty team developed, tested and refined a final project rubric. Rubric categories included all program components: courses from

one of five regions in the world; study abroad, related co-curricular activities and a final project. In year one, faculty members' assessments were inconsistent. Students were rated in the rubric as mostly meeting program expectations. The outcomes were achieved in part. Most students did not achieve outcomes not listed clearly within the rubric. Evaluators reported difficulty in assigning a numerical score. Thirteen different mentors used the revised rubric in 2014 to evaluate 20 final projects. Mentors accessed a training website learning how to use the rubric. While the results were more consistent and students mostly demonstrated a higher level of proficiency, more fine-grained levels of competence were desired and added for the next assessment cycle. Numerical scores were eliminated. Finally, sample final projects at varying levels of competence were provided to faculty mentors to assist with normalizing scores. Individual training supplemented web training. Further assessment should be done in the coming year to pursue the possibility of creating a seminar series for students completing the final project and that would provide a framework for greater program support and reflection.

399

Meeting the Grand Challenges

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This presentation highlights a collaborative project to develop a food/agricultural sciences workforce that is well prepared to *meet the grand challenges* associated with USDA priority need areas, i.e. hunger/food security, sustainable energy, childhood obesity, climate change, and food safety. Program components include transdisciplinary grand challenge courses; undergraduate research and service learning experiences in the priority need areas; and development of grand challenge youth outreach materials delivered via student interns through Extension and Boys and Girls Clubs--locally and in tribal communities. A special certificate designates students as 'Grand

Challenges Scholars' at graduation. Presentation objectives are to: 1) Overview the project, including its rationale, key collaborators and funding sources; 2) Highlight program features such as transdisciplinary courses, systems thinking training, 'personal responsibility projects', undergraduate research, social media integration, and community partnerships; 3) Share formative assessment results indicating strong positive student and faculty participation and learning outcomes; 4) Engage presentation attendees in a discussion about other innovative ways to help students prepare to meet the grand challenges. From our project, several student research efforts have been presented on campus and at regional and national venues. Evaluation results indicate we have made progress toward cultivating student success among program participants. Survey responses indicate students feel more aware of the grand challenges, have a stronger sense of personal connection to the challenges, have thought critically and creatively about solutions to the challenges, have engaged their communities on grand challenge issues, and, importantly, feel better prepared to help meet the challenges.

403

Utilizing Multi-University Collaboration to Enhance Distance Education Materials for Principles of Professional Selling Courses: A Case Study

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Online courses offer an opportunity to enrich student knowledge by presenting curriculum content from multiple sources. This case study reports on an initiative to enhance student learning in Principles of Professional Selling courses taught across the United States, by providing informative learning modules developed by experts from four major universities in agriculturally-rich regions of

the country. Literature suggests that interdisciplinary and multidisciplinary learning is important in optimizing students' educational and instructional experiences. Hence, this project assembled a group of professional sales teaching faculty members with nearly 100 years of cumulative experience to develop and deliver an innovative base of knowledge for students. Professional Selling courses are taught at nearly 100 universities across the country (Deeter-Schmelz and Kennedy, 2011). In most cases, the curriculum instructor creates their own course materials and supporting video units. This project assembled faculty from the four different universities to create a set of shared materials to be used by any Principles of Professional Selling course. Participating faculty created video presentations and engaged in video discussions with industry professionals to demonstrate a variety of selling skills, techniques, or subjects of interest to agricultural students. The result of this collaboration is an inventory of coordinated learning units built on the individual strengths of each instructor. Presentation of the experiences and learnings from this cooperative, collective approach to course design will allow agricultural instructors to understand the problems and opportunities encountered in communication, logistics, and time that go along with creating collaborative course materials.

Poster Presentations

001

Teaching Assistant Perspectives on a Diversity and Social Justice Education Course for Collegiate Agriculture Students

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In recent years the United States has been growing in diversity, resulting in changes throughout the cultural landscape of our nation. These changes reach across collegiate instructing capacities uniting them with a new diversity of workers in the agricultural sector. Due to the fact that the agriculture industry is continuing to become more diverse, the need for industry workers to effectively communicate and interact cross-culturally is rising. One response to this need has been to integrate diversity and social justice education at collegiate levels into existing agricultural training and education. Resistance often accompanies diversity and social justice education, causing both professors as well as graduate teaching assistants (TAs) to be faced with the task of working through challenging educational situations. TAs are increasingly responsible for teaching undergraduate courses yet their academic perspectives are underrepresented in current literature. This presentation is about specific challenges experienced by TAs when teaching a diversity and social justice education course to agricultural students at a land grant university and solutions they have implemented through informal discussions.

004

Excitement in the Classroom: An Active Learning Approach Toward Global Sustainability Issues in a Textiles Course

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Research suggests that teachers who help students make connections between the classroom and their everyday lives can increase personal relevance and interest among learners. Active learning is a method that helps students engage, understand, and retain information during the learning process. In this study, students who were enrolled in an introductory textiles course completed a lecture enhanced with an active learning event created to meet the class objectives. The primary goal was to diversify instructional activities directed toward sustainability issues related to textiles to achieve three objectives: (a) to increase students' interest in sustainable issues occurring in the textile industry, (b) to provide students with real-world applications, and (c) to increase students' understanding of the interrelationships between fiber, yarn structure, fabric construction, finishing, and color. To assess their learning, the activity "From Crayon to Lipstick" was introduced. Each student was asked to create personal lipsticks made from pure natural ingredients and nontoxic crayons during the class challenge. Participants were asked to complete an anonymous project assessment wherein they reflected on their experience during the learning process. A total of 26 responses were collected from students' interactions in the classroom. Through content analysis and open coding methods, 97% ($n = 26$) of the narratives were found to refer to students' ability to apply their learning to real-world applications. Themes emerged were (a) creative way to learn, (b) entrepreneurial and (4) eye-opening. The experience was very enriching, as the students were able to visualize, reflect, and apply their learning to everyday life.

005

Assessing Knowledge, Performance, and Consequence Competence in a Technology-Based Professional Development for School-Based Agricultural Educators: An Evaluation of the CNC Plasma Cutting Technology Workshop

P. Ryan Saucier and G. Curtis Langley
Sam Houston State University, Huntsville, TX

Agricultural mechanics curriculum provides students with opportunities to engage in hands-on laboratory learning experiences that emphasize cognitive development, mechanical skill attainment and academic concept application through technology-rich context, i.e. CNC plasma cutting technology. Although laboratories are essential

educational tools for agricultural mechanics programs, recent research indicated many school-based agricultural educators lack the knowledge and ability to teach students advanced curriculum content in a laboratory learning environment noted that professional development education for teachers is essential to improving teacher retention, program continuity and the preparation of fully qualified and highly motivated agricultural educators at all career stages. Additionally, in 1993, Little found that it is necessary to link industry experts with teachers to improve their competence in teaching curriculum, establishing mechanisms of consultation and support and to introduce new ideas. This study sought to evaluate the effectiveness of the EZ Router/ EZ Plasma CNC Plasma Cutting Technology workshop, determine if teachers' Knowledge, Performance and Consequence Competence changed and determine the professional development needs of the participants. The 1980 Borich needs assessment model was used to determine mean weighted discrepancy scores. Findings indicated that the workshop was overall effective; overall, teachers Knowledge Competence, Performance Competence and Consequence Competence changed positively after completion of the workshop; and participants were mostly in need of future professional development in the CNC plasma cutting technology skill area of Control Software Operation – Troubleshooting.

006

Professional Development Needs of Texas School-Based Agricultural Educators Regarding CNC Plasma Cutting Technology: A Snapshot Assessment Method

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Historically, agricultural mechanics coursework has been considered an important and necessary construct of secondary agricultural education curriculum across the U.S. Researchers have noted that agricultural mechanics content provides students with opportunities to engage in hands-on learning experiences that emphasize cognitive development, mechanical skill attainment and academic concept application through technology-rich context, i.e. CNC plasma cutting technology. Although laboratories are essential educational tools for agricultural mechanic's programs, recent research indicated many school-based agricultural educators lack the knowledge and ability to teach students advanced curriculum content in a laboratory learning environment. The purpose of this study was to determine the CNC plasma cutting technology in-service needs of school-based agricultural educators in Texas who attended a workshop in the summer of 2015. The research objectives for this study were as follows: (1) Determine selected personal, professional and program demographic characteristics of school-based agricultural educators who instruct in and manage agricultural mechanics programs (2) Determine the self-perceived importance levels and ability levels that school-based agricultural educators place on CNC plasma cutting technology competencies and (3) Determine the professional development needs of school-based agricultural educators regarding CNC plasma cutting technology. Results indicated that teachers had the greatest in-service needs in machine code software operation and had the least professional development need in the area of arc flash safety from the plasma cutting machine.

008

Utilizing "Mystery" Ingredients as a Creative Teaching Tool to Develop Value Added Agricultural Products

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Becoming less dependent on imports is vital towards achieving local sustainability especially when living in Hawaii. The cost of shipping goods to the islands increases the final price of commodities for the consumer. A course at the University of Hawaii at Hilo, Agriculture 205, Value Added Agricultural Products, is designed to provide students with the basic knowledge to develop value added agricultural products with emphasis on using underutilized, excess, or damaged produce. These products can reduce the dependency on high priced imports and can generate income for locally developed products that can be sold via the internet. Based on the hit food show "Chopped", students in this course were challenged to develop value added products from "mystery" ingredients provided by a local farmer. The students were given the product, learned

about the properties then were given two weeks to develop a value added product. The mystery ingredients, that were all grown locally, included: cloves, lemon grass, heart of palm, edible root ginger and finger limes. The students rose to the challenge and developed value added products such as: toilet bowl deodorizer/cleaner, soaps, pickles, drinks, lotions, cough suppressants and jams. At the end of the semester, the students showcased their value added products at an exclusive event, "Moving on the Road Toward Sustainability" held on the UH Hilo campus. Some of the products developed during the course are now being sold in local markets.

009

Impact of a Short-Term Study Abroad Program on Student Career Interests and Goals

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As our society continues to gain a more global emphasis, it is important that college students take advantage of opportunities that will increase their global mindset and develop their career prospects for globalizing the work place. Employers are recognizing the extraordinary benefits of studying abroad, and are seeking college graduates who have had study abroad experiences. However, long-term study abroad programs can be impractical for many college students due to the excessive amount of time and money they have to invest. Therefore, instructors are planning short-term study abroad programs as an alternative to these high-cost long-term programs. Short-term study abroad programs have the potential for students to increase their cultural awareness and understanding, as well as improve their future career choices and opportunities. The purpose of this descriptive survey research was to determine the impact of a short-term study abroad program on participants' career interests and goals. This study was conducted online with North Carolina State University students who participated in an international agribusiness short-term study abroad program to Italy and Croatia. Results indicated all respondents were able to increase their global awareness. Twenty-two percent of respondents also indicated they wanted to pursue careers with an international focus after participating in the program. We concluded that the short-term study abroad program is effective in creating students' global awareness as well as motivating them to pursue careers with an international focus. Based on the findings, we recommend short-term study abroad programs to cultivate student success in the global workplace.

011

Co-Curricular High Impact Learning Practices: What Are They and How Do We Evaluate and Document Them?

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Co-curricular high impact learning practices offer students unique opportunities to enrich and extend their learning beyond the walls of traditional classrooms, for example, through fieldwork, undergraduate research, internships and study abroad. Indices of student success, such as GPA, time to degree and graduation rate, are elevated when students take advantage of two or more high impact learning experiences; this is particularly true for underrepresented and low income students. Colleges of agriculture are unique as they naturally integrate high impact learning experiences into their curriculum. However, while agricultural students actively engage in high impact learning, we lack evidence that supports the impact of these practices on student development. As pointed out by George Kuh, Association of American Colleges and Universities, this is a significant limitation: "...on almost all campuses, utilization of learning practices is unsystematic, to the detriment of student learning". Over the past 5 years, exit surveys with University of Illinois College of ACES seniors confirmed strong levels of participation in study abroad, undergraduate research, internships, leadership and service learning. Seniors also reported significant growth in core learning objectives, such as critical thinking and problem solving. Nonetheless, it remains difficult to quantify the specific learning outcomes that emerge from each type of high impact practice. This paper will identify a set of co-curricular learning experiences that students may leverage and propose ways to formally track, measure and evaluate the learning outcomes that result from

these experiences, in the context of agriculturally-relevant disciplines.

014

Assessing Curriculum Needs for the 4-H Animal Science Program in Iowa

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Youth have access to lots of information about animal science, but what information are they actually using and what do they need to help them be successful? Because of their key role in implementing 4-H curriculum, volunteer leaders, parents and university extension educators were invited to participate in a series of focus group interviews held in five Iowa counties. The objectives of the study were to determine what materials educators were using to teach animal science programming, what youth were using to learn on their own, perceptions of those materials, what was needed in an animal science curriculum and what format would be most ideal. Findings indicate that both educators and youth used a variety of sources of information which include other people who are involved in the project, the internet and industry workshops and clinics. Focus group participants perceived these sources of information to be easily accessible, but concerns arose about the accuracy and bias of the subject matter. Suggestions for new curriculum were primarily focused on preparing for show and basic animal husbandry. Every focus group intimated that the most ideal format for a new curriculum would be web-based, interactive, relevant and easy to access on any type of device. Printed materials should be offered to educators, but very few youths obtain information from printed publications. Face-to-face workshops are still extremely valuable and materials should be created to support educators in putting together educational workshops.

015

Motivating Factors for Student Choice of Major: A Longitudinal Study

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The purpose of this study was to identify factors that influenced students' choice of major when enrolling in the Agribusiness, Agricultural Education, Agricultural Mechanization & Business, Environmental and Natural Resources, Plant and Environmental Sciences, and all programs within the College of Agriculture, Forestry, & Life Sciences (CAFLS) at Clemson University. Specific research questions were developed to determine: the intended major choice; reason why the student may have changed majors; the level of influence of individuals, along with the characteristics of the anticipated degree program to see if they influenced major choice; when the student began and finalized the college/major choice process; and the principal factor(s) that influenced the student's decision. This four-year study, Fall 2012-2015 semesters, had a population of 152 purposefully selected freshman and transfer students throughout the programs. A panel of experts developed the questionnaire that was administered by SurveyMonkey. The findings indicated the most influential individual when choosing a major was the parent or guardian followed by a CAFLS faculty/staff and their agriculture teacher. The most important factor motivating a student's decision was the career opportunities available after graduation followed by quality/reputation of courses. Students reported their main reason for changing majors was isolation and application of theory followed by career opportunities. For the last four years, they reported having made their final decision about majors during their senior year, second semester of high school. Findings suggest that recruiting efforts need to target and communicate with parents and agricultural educators as early as possible to increase enrollment.

023

Incorporating Assessment in the Design of a New Interdepartmental Program

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Undergraduate programs in the College of Tropical Agriculture and Human Resources (CTAHR)

are typically managed solely within a single department. For some programs, the numbers of graduating students each year are low and not considered viable. There is administrative and legislative pressure to dissolve small programs at the University of Hawai'i at Mānoa, including the agriculturally-focused BSc programs in Tropical Plants and Soil Sciences and Plant and Environmental Protection Sciences. The two departments within CTAHR that manage these programs conjoined to proactively revise their undergraduate programs. The outcome was a merged, redesigned program in agroecosystems having a common core, five areas of specialization and a focus on issues in the tropics. From the inception, developing an operable plan for program assessment was a priority. Consequently, even before selecting the program name, the program-level student learning outcomes (SLOs) were created to form the basis for program construction. A combined departmental meeting generated a curriculum map identifying how each of the core courses articulated with the SLOs, evaluated gaps and issues in the curriculum. Potential signature assignments were identified as indicators for assessment and templates for these were drafted. A number of opportunities and challenges arose throughout this process. Key to the successful creation of this program was encouraging faculty to think more broadly about the content of and rationale for what we teach and the anticipated knowledge and skills of graduating students.

026

Graduate Student Recruitment: Student Perceptions of Recruitment Strategies Utilized by a Southern Land-Grant University

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Enrollment in graduate education programs at public higher education institutions face increased competition from for-profit institutions with heavy recruitment strategies. Public institutions must evaluate recruitment strategies to ensure increased enrollment. A study conducted by the University of Georgia sought to investigate the attitudes and perceptions regarding the application process in order to determine how recruit-

ment can be improved. Survey constructs included: (a) how students learn about the department, (b) what students look for in the department, (c) how to best communicate with students and (d) how to best utilize websites for recruitment purposes. Results indicated that the top four ways Master's students learn about the department were from conference fairs, previous classes in the department, campus visits and through the department website. Students selected programs based on quality of the university, quality of the department, reputation of faculty, and assistantship opportunities as the most important factors influencing students' decision to apply to the graduate program. The majority of students communicated via email, face-to-face meetings, phone calls, or postal mail. Students looked to the website for details such as application information, financial aid, assistantship information, faculty information, departmental information, course requirements, research programs, contact information and tuition costs. University leaders should focus their resources on the top ways students learn about the department. Emphasis should be placed on the reasons why students select programs and ensuring the availability of information that graduate students' value. Furthermore, agricultural graduate programs should make concerted efforts to develop and implement strong recruitment plans.

030

Employment Competencies Desired by Agricultural and Natural Resource Industry Leaders

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Agricultural educators should consistently evaluate the competencies offered in their programs, as well as learn from industry leaders how best to prepare college graduates for the challenges of tomorrow's workplace. Therefore, the purpose of this study was to determine key employment competencies desired by agriculture and natural resources leaders. A descriptive survey was used to collect data. Results indicate that the highest level of agreement for personal competencies for both agriculture and natural resources leaders was being dependable, problem solving and taking initiative. The highest level of agreement for

leadership competencies for both groups was critical thinking, clear communications, and strategic planning, and the communication competencies with the highest level of importance were dealing with crisis, public speaking, and strong writing skills. A comparison of the mean scores between the personal and leadership competencies subscales indicated both groups valued these competencies equally. The mean scores for the communication competencies showed agricultural leaders tend to value these competencies less than natural resource leaders. The findings of this study call for a review of the competencies taught in agricultural education, communication, and leadership degree programs. Based on these findings, it is recommended that problem-based instruction be developed that includes real-life crisis management scenarios to teach communication skills, while developing personal and leadership traits. It is also recommended to integrate industry professionals' feedback when university professionals create program requirements and coursework, in order to design programs that reflect the needs of the industry.

032

International Course Development at the Program Level: Collaboration and Student Interest

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This project initiated curriculum development and collaboration between two land grant institutions in Pennsylvania and New Zealand at the academic program level. The meaning of the presentation is to convey to other academic programs the strengths and weaknesses of coordinating and constructing an international program at the department level. The delivery of the New Zealand Natural Resources course to Penn State undergraduates engaged them in interdisciplinary student learning at their home university, as well as abroad. The utilization of resources across disciplines- both internationally and domestically- constructed a deeper and more lasting learning platform as seen in the investment of student writing, interpersonal communication and student surveys. Several college strategic outcomes were used to focus the goals and contributions for students. Graduating global citizens well versed

in leadership skills with the ability to understand the connection between international communities was the foundation of curriculum development between the two universities. Students were exposed to faculty experts from across their home institution in a 1 credit course on topics related to learning outcomes during the embedded international program. The success of the program can be partially measured by student interest in enrolling in subsequent courses, development of collaboration skills and innovative thinking.

034

Using a Professional Certification Program to Cultivate Undergraduate Student Success

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Numerous disciplines within agriculture offer professional certifications that frequently include an exam plus education and work experience requirements. Certified Crop Adviser (CCA) status is awarded by the American Society of Agronomy through the International Certified Crop Adviser (ICCA) program. Receiving certification can enhance employment opportunities for students. The study's objective was to evaluate Kansas State University (KSU) Department of Agronomy's participation in the ICCA In-Training Collegiate Program. The Department provides a 7-week workshop series prior to the exam for pre-registered students to review major coursework concepts and pays part of the exam fee. From 2012-2015, 81 seniors took the exam. Of those, 86% passed the international exam and 73% passed the Kansas state exam, versus 64% international and 38% state passing rates for all other professionals in Kansas during that time. In December 2015, Kansas had 350 CCAs, of which 50 have completed the KSU program. The KSU model demonstrates how certification exam results have been used as an outcomes assessment tool. Through the formal relationship with the certification agency, exam performance data has helped identify areas of strength and/or weakness in the curriculum. Comparison of passing rates to national averages also provided a quality rating for the program. Overall, the ICCA

In-Training Collegiate program has provided valuable assessment data and resulted in higher passing percentages for students compared to other professionals. It is possible for other disciplines to provide a similar program to help students achieve professional certification as well as to implement as a means of outcomes assessment.

036

Development of a Junior Naturalist Curriculum Applicable to all Biogeographical Regions of South Carolina

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The purpose of this study was to develop a Junior Naturalist Curriculum that was applicable to all biogeographical regions of South Carolina, and then to successfully introduce the curriculum to a group of children that could lead to statewide implementation of a Junior Naturalist Program. The curriculum was created using South Carolina State Education Standards, and it was designed to allow students to acquire knowledge through their own actions and self-discovery in a setting outside of a typical classroom. Their learning was exemplified through creative thinking and exploration of the outside environment, which in return produced a younger generation of citizen scientists. The curriculum was taught to a group of twenty-one children from a local middle school, that were purposely selected as part of a summer camp which took place at Clemson University. After the lessons were taught, the children were given a survey which consisted of seven questions designed to gather an understanding of the overall impression of the lessons and to see if they were interested in a Junior Naturalist Program. The findings of the study showed that not only did the program inspire the children to be outdoors more often, but they gained an appreciation and ownership of nature that was not previously there. Test group results conclude the children of South Carolina would welcome a statewide Junior Naturalist Program, and a program like a Junior Naturalist, has the potential to be very successful throughout the state.

037

Using Cooperative Learning Groups and Peer Teaching to Combat the Challenges Facing Veterinary Laboratory Courses

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Across the nation veterinary schools are facing challenges such as increasing enrollment, decreasing funding, and increasing regulations of laboratory formaldehyde levels. These challenges are forcing veterinary schools to rethink their course designs. At a Midwestern land grant veterinary school, within their redesign, an opportunity presented itself to enhance the current learning environment. The purpose of this study was to investigate the newly incorporated cooperative learning groups and peer teaching review period through a descriptive design. Student data were collected through a questionnaire consisting of Likert-style questions regarding cooperative learning groups, peer teaching, and the redesign of the anatomy laboratory, along with open-ended questions regarding the overall strengths and weaknesses of the laboratory. Instructor data were collected through open-ended questions regarding cooperative learning groups, peer teaching, and the redesign of the course. The results indicated both the students and instructors perceived the cooperative learning groups enhanced student learning. The students also perceived the peer teaching review period enhanced learning, but the instructors were split on the effectiveness of the peer review method. Since the cooperative learning groups were perceived to enhance student learning, the course will continue to utilize cooperative groups in their current form. Given that perceptions varied regarding the effectiveness of the peer teaching review, the structure will be reformatted and re-visited at a later time for effectiveness. This course redesign not only addressed the challenges facing veterinary schools but also enhanced the student's learning through cooperative learning groups and peer teaching.

038

Internal and External Values Ascribed to College Major Choice by Students of Color in Agricultural and Life Sciences

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The demand for diversity in agriculture is at an all-time high. However, common misconceptions and stereotypes of agriculture have resulted in underrepresented populations developing negative views toward the industry, thus leading to a deficit in students of color pursing degrees in agriculture. The purpose of this study was to gain an understanding of the factors which motivated students to pursue degrees in agriculture and life sciences and how those factors contribute to them remaining in the field or leaving the field. To further investigate, a phenomenological qualitative study was implemented, using a focus group of Minorities in Agriculture, Natural Resources & Related Sciences (MANRRS) members (n = 18) from a mid-Atlantic university. Participants responded to questions regarding several internal and external values such as, why they selected their major, and perceived opportunities for growth now and in the future, to name a few. Responses were recorded and coded into the following areas: *passion*, *knowledge,* which are the internal values and *advancement*, and *connection*, the external values. As a result, the following conclusions were developed: a) passion for helping others through the work that is done in their field b) desire to share their knowledge and expertise with communities c) the availability of opportunities to enhance skills and gain experience. Several potential barriers were also revealed which include the lack of support by peers and faculty and the inability to shape research into one's own interest area. Recommendations for future research include conducting this study using a national sample.

039

Methods of Inoculation for *Acacia koa* Wilt Resistant Seedlings with *Bradyrhizobium*

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Acacia koa is an evergreen nitrogen-fixing tree that forms a symbiotic relationship with *Bradyrhizobia* in the roots and is the dominant over story species in the native Hawaiian mesic forests. Forest restoration for sites around the islands is often accomplished by planting nursery grown seedlings. Successful out-planting of these trees requires healthy plants with well-formed *Bradyrhizobium* (root nodules), which supply the young plants with nutrients essential for out competing alien vegetation and decreasing the mortality rate. This experiment focused on identifying the most efficient form of *Bradyrhizobia* inoculation for nursery seedlings. We compared the growth rates of the vegetative height, as well as the biomass of the *Bradyrhizobium* using two different methods of inoculation. The first method we used isolated *Bradyrhizobium*, grown on media, and then inoculated into soil in a water solution. In the second method harvested *Bradyrhizobium* from mature *A. koa* was pulverized in a water solution, and then topically added to the soil. To gain sufficient data the experiment ran ten weeks, taking weekly height measurements and concluded with the harvesting of the *Bradyrhizobium* to measure total mass. All three sets of groups were fertilized weekly. The results indicate that the isolated *Bradyrhizobia* method is more efficient than the control, but not significantly different from the harvested *Bradyrhizobium* method of inoculation.

040

4-H Afterschool Volunteer Training Program

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Providing quality training for volunteers, especially for adults who work with youth enrolled in 4-H afterschool programs has gained increased attention. A primary reason is that volunteers often do not possess the requisite knowledge and skills to adequately foster the achievement of various competencies and youth outcomes. The purpose of this poster is to describe a volunteer training program geared toward adult 4-H afterschool volunteers who work with youth animal science projects. The 4-H Animal Science Afterschool Training Program is designed to provide adult 4-H afterschool volunteers the knowledge and expertise needed to effectively work with elementary-aged youth. Volunteers receive training in areas

related to positive youth development, learner-centered teaching strategies and animal science concepts. Training occurs over a two-week period and is facilitated by a local 4-H youth educator who helps volunteers learn effective ways of utilizing the community's resources to enhance experiential learning opportunities related to animal science projects and develop programming that is based on sound educational and youth development practices. Along with increasing overall educator effectiveness, the training session provides strategies that will enable adult volunteers to provide youth a safe and caring environment that meets their social, physical and emotional needs. This volunteer training program can serve as a model to train volunteers who work with youth-based programs in afterschool settings.

044

The Value of Exploring Hands-on Agriculture in the United States

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In the time of online education, a large number of students may have missed out on the value of hands-on experiential learning. Additionally, a large percentage of undergraduate agricultural students rarely experience internships, cultures or agricultural practices outside their home state. Sixteen students took a 7-day agricultural industry tour as a for-credit course throughout the Midwest during the 2015 summer. The main objective of this tour was to expose students to multiple facets of agriculture including animal nutrition, plant genetics, equipment manufacturing, and transportation of agricultural products. Locations were chosen because they showed an aspect of the agriculture industry different than the home state. A second objective of this industry tour was to provide the opportunity for educational and career advancement. Because of the size of the group and the locations visited, tour participants had the opportunity to focus on professional development and networking at each stop. In some cases, industry representatives talked one-on-one with students about specific job requirements, as well as personal and professional skills necessary to be successful. At the completion of the tour, students were surveyed about their experience. Findings indicated the tour was a success. For many participants, the opportunity to travel away from the Pacific Northwest to learn about the agricultural industry was the highlight. Other students identified the diversity of agricultural industry locations provided the greatest opportunity for learning and professional growth.

046

Cultivating Student Success Across a Greenhouse Curriculum

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Multiple stakeholders are involved when service-learning is incorporated in a course including students, faculty, and a community partner. Each stakeholder has a different role in the service-learning project and consequently different expectations. To effectively evaluate the impact of service-learning in a course there needs to be multiple means of analysis including input from the multiple stakeholders. The purpose of this pilot study was to evaluate the students' perspective on the impact of service-learning across an entire greenhouse curriculum. The greenhouse curriculum includes three core production courses focused on hydroponic food crops, potted and cut flowering crops, and bedding/garden crops. At the end of each course from fall 2013 through spring 2015 (n=3), students completed a two-question survey. The questions addressed: 1) how the service-learning projects enhanced their learning in the course; and 2) how the service-learning component could be improved or expanded to enhance student learning. Data was analyzed to determine themes and sub-themes. Common themes related to how the service learning enhanced student learning included a sense of purpose to the laboratory section of the course (hands-on crop production) and a connection of food security to controlled-environment agriculture. The most common themes related to how the service-learning component could be improved or expanded included: modify the crops being grown; allow students to be more involved in the delivery of plants to the community partner(s); and involve students in the entire growing process from crop selection to harvest.

048

The Mock Well: A Solar Water Pumping Demonstration Project

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A do-it-yourself video produced by a solar pumping company and posted to their webpage served as the inspiration of this project. Funding from a campus institution sustainability grant provided the materials. Working with our Campus Agricultural Center, a suitable location was selected adjacent to an operating windmill. Students in the AGTM 350 Applications in Agriculture Mechanics course were shown the pumping video during a course lecture. The following three three-hour lab periods included excavation and installation of a pole-mount solar photovoltaic (PV) module and pump controller, excavation and installation of a "well" from a 10-foot section of eight-inch PVC pipe, assembly of the submersible pump, drop pipe line, safety rope, sanitary well seal, electrical box, conduit, and component wiring. A 100-gallon poly stock water trough catches the water before it leaves the tank and returns to the well through 1 ½ inch galvanized pipe. Using solar tools, the module is tilted and oriented to maximize optimum energy output. Students worked in groups to assemble and install the components. Students documented the process and submitted project reports at the end of the project. The reflective reports revealed the knowledge gained by the students. Skill learned included plumbing, electricity, solar photovoltaic energy systems, and basic well pumping fundamentals. The pump can be easily removed from the well and disconnected from the system for future classes. This project can be easily replicated with minimal funding, approximately $2,500.00.

049

Pre-Course University Student Perceptions of Renewable Energy Sources

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Students enrolling in AGTM 350 Applications in Agriculture Mechanics lecture/laboratory course were invited to complete an online pre-course survey. The purpose was to determine student pre-course perceptions of renewable and non-renewable energy sources, with a focus on energy sources found in Arizona. Due to the hands-on nature and facility limitations, the maximum number of students is limited. By the end of the first week of class, all 30 students (100%) attempted to complete the questions and provides response to the statements. The survey consisted of "yes/no" questions (measure energy knowledge, and statements anchored by Likert-type scales (strongly agree to strongly disagree). The instrument was adopted from a published study of student perceptions of renewable energy. Examples of findings to questions differentiating renewable from non-renewable energy sources found coal (21%), natural gas (43%) and nuclear (45%) were considered "renewable" energy sources. Future energy needs will be met by: utilizing renewable energy sources (100%); drilling offshore for oil and natural gas (70%); building additional nuclear power plants (68%); utilizing oil shale resources (67%); and utilizing organic wastes to produce energy (67%). Student perception of their knowledge of renewable energy varied from "Don't know" (34%), "Good" (28%), "Poor" (24%). Demographic profile of the class was male (55%), junior (45%), from a farm/ranch background (38%), with a career goal of returning to the family farm (37%). Student perceptions of renewable energy, and energy adoption practices varied. Findings provide direction for designing hands-on experiences to provide for career preparation.

050

Learning Communities at Purdue University

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Learning Communities (LCs) were initiated at Purdue University in 1999. LCs are academic programs that allow first-year students from the same major or with similar academic interests to take three courses together and reside on the same residence hall floors. The benefits associated with being an LC participant, include student and faculty interaction, instructors ensuring that the content associated with the three linked courses is connected, and out-of-class activities that complement the student's in-class learning. Students who participate in learning communities

come from a diverse ethnic and racial background. In fall 2015 there were 55 unique LCs an increase of 100% since 2005. The number of events planned for LCs has increased from 130 to 1130 in the last ten years and correspondingly the number of freshman students participating in LCs has increased by 65% since 2005. Learning Communities not only attract a diverse group of students to Purdue, they also increase their chances of staying at the University. Research shows an increase in freshman retention associated with students in LCs - 93% compared to non-participants, 90%. LC students do better in their coursework, are better satisfied with their overall Purdue experience, and are more engaged with the University community.

052

Quality Seed Leads to a Bountiful Harvest: A Look at Internships

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Kansas Department of Agriculture

Experiential learning opportunities, to include internships, are viewed as valuable tools for undergraduate student success. In January 2016, a survey was sent to NACTA members regarding internship requirements, with a 41% response rate from members reached. The survey gauged expectations of the student, assessment, notification of future employment opportunities, and legal responsibilities of advisors. Over 50% of the respondents indicated internships are required of their majors and are offered for credit. Eighty percent of students are required to submit their goals and objectives and meet with their academic advisor prior to their internship. Formal assessment procedures are in place for over 80% of the programs with the focus on written and oral communication skills. Students are assessed by face-to-face meetings by 73% of the respondents with over 90% of the interns required to submit a written report of their experience. University Career Services offices are available in over 94% of the institutions represented by the respondents with 29% considering their Career Services office as very active in notifying students of employment opportunities. Forty-four percent responded Neutral or Somewhat Active on recruitment of new agriculture companies to their campus. Nearly 98% of respondents are unaware of the National Association of Colleges and Employers and the

ethical and legal responsibilities advisors have when working with potential employers. The quality seeds needed for a bountiful student experience include: interested students, faculty advisors, administrators, career services personnel, and industry partners. Internship opportunities are a great transition to full-time employment and a knowledgeable future workforce.

053

Recruitment, Training, and Placement of Underrepresented Minorities in Forestry: Lessons from National Needs Master's Fellowship Program

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The School of Forestry and Natural Resources at the University of Georgia received a National Needs Fellowship grant in 2012 to support career preparation for underrepresented minorities in forestry. The objective of this presentation is to analyze and describe the outreach and selection processes, the qualifications and demographics of the selected Fellows, and their progress and accomplishment to identify key factors that influence their success. While the program has largely achieved its goals—completing and successfully placing Fellows. It has encountered several challenges. Outreach efforts were aimed at southern natural resource programs, 1890 land-grant universities, and natural resource professional organizations, and involved several different media. Recruitment was challenging, however, and Fellows came from institutions other than the ones targeted. While Fellows met the admission criteria, some were inadequately prepared for college and addressing this issue through undergraduate courses proved in part insufficient, requiring special efforts to reach acceptable standards. Time management was challenging with course loads, emphasis on academic excellence, and several experiential activities. Ties to home as well as minority cultures sometimes prevented Fellows from interacting with other graduate students, while such interaction eventually helped them to excel academically. The summer internship program was very successful, with each Fellow participating in two internships during the program resulting in employment offers from leading forestry organizations.

Lessons from the program point to the development of new recruitment strategies, a very early assessment of deficiencies leading to more effective advising and mentoring, and the importance of paid summer internships in securing placement.

054

Interdisciplinary Learning of Energy though Integration of Socioeconomic Topics

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With an increasing demand for college graduates that are conversant in energy-related issues such as climate change and energy efficiency, the integrated education of energy technologies and socioeconomic issues has become essential to undergraduate curricula. The delivery of such an interdisciplinary curriculum, however, face challenges from the diverse academic background of the class, as well as from the limited depth of in-class discussions between unprepared students. These challenges need to be addressed before the curricula can reach, engage, and enlighten students that only have a basic understanding in science, engineering, policy, sociology, and economics. In a newly developed course in the Bioenergy Program at Oregon State University, we experimented novel ways to connect socioeconomics with energy technologies while avoiding the incurrence of heavy course load on learning miscellaneous technicalities. Instead of learning about individual technologies (e.g. wind, solar, hydropower) that relate to different public policies and economic impacts, students participate in a discussion on key issues that are applicable to a broad spectrum of technologies. The flipped classroom model is used to develop critical thinking in students via analyzing complex socioeconomic issues related to energy. During our initial offering of the course, we were able to engage 32 students from a variety of majors. Our assessments demonstrate that the new course model is viable and effective in conveying knowledge and encouraging free-choice learning in energy-related socioeconomics.

057

Prioritizing Pertinent Components of a College-Level Bioenergy Curriculum Using the Delphi Technique

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Bioenergy has emerged as a potential solution to concerns regarding climate change and domestic energy security; however, a successful bioenergy industry depends on a well-trained workforce. Currently there is a severe lack of peer-reviewed bioenergy education literature available. Using the Delphi technique, a mixed-methods approach used to reach group consensus, bioenergy experts in both educational and employment sectors provided input about what a college-level bioenergy curriculum should include. Bioenergy is a vast, interdisciplinary, and complex field, and initial survey rounds distilled numerous technologies and associated topics into a set of components that are pertinent in a college-level bioenergy curriculum. The resulting themes were: Types of Bioenergy, Logistics, Societal Issues, Bioenergy Market, Environmental Impacts, Biomass Production, Biomass Composition, Conversions, Energy Basics, Current Technologies, Life Cycle Analysis, Policy, Business-Related Knowledge, Non-Bioenergy-Specific Fundamentals, and Bioproducts. These were prioritized using a scale of 1-5 (1=non-essential to 5=essential). Results are intended to bolster emerging bioenergy training programs to meet the needs of future employers, and can be used as a framework that may be adapted for region-specific technologies to support a forthcoming bio-based economy.

058

Using Concept Mapping to Facilitate Teaching Abstract Conceptualization and Reflective Observation

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Foundations of Agricultural Education is an online graduate course which is designed to serve as an introduction to the depth and breadth of the Agricultural Education discipline. Course content in-

cludes an overview of the history, various settings, philosophical premises, and knowledge bases of the profession. Concept mapping was used to assist with and measure student learning by helping students to visually depict abstract ideas, form connections, and actively reflect on their learning. The students are required to complete two concept maps articulating their understanding of the Agricultural Education discipline. A preliminary concept map assignment was designed to gauge the initial knowledge of students entering the course. The final concept map was assigned as part of the final exam and designed to provide students the opportunity to visually articulate their newly revised concept of the agricultural education discipline and reflect what was learned in the course. The interaction between abstract conceptualization and reflective observation results in assimilative knowledge in the experiential learning process. By using the two concept map assignments students were able to make meaning of the abstract conceptualization of the course material and reflect on the knowledge gained. The preliminary and final concept mapping method could be a valuable tool to facilitate abstract conceptualization and reflective observation in other courses that require students to demonstrate an understanding of the depth, breadth, and interconnectedness of abstract content. Literature related to concept mapping, how it works including preliminary and final maps as well as advice for others will be shared.

059

Fermentation Revival in the Classroom: Ancient Human Practices as Modern Health Fads

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The collection of microorganisms in the gastrointestinal tract, known as the gut microbiota, plays a critical role in overall health and wellbeing. Maintaining the appropriate balance of beneficial microbes in the gut has been shown to prevent and even treat certain disorders, such as type II diabetes and Chron's disease. One way to restore balance is by seeding the gut with probiotics, or beneficial microorganisms. Probiotics are commonly found in fermented foods and beverages, such as kefir—a fermented milk product. Prophylactic consumption of fermented products, like kefir, may contribute to increased health and disease prevention. However, the content of various types and brands of kefir may vary significantly. Therefore, specific strains of beneficial yeast and bacteria were identified and quantified from various sources of kefir, including homemade kefir prepared by the students themselves. Preliminary evidence demonstrated comparable colony forming units (CFU) per cup (58 billion CFU) of homemade and brand-name kefir. However, students identified the commercial pasteurization process as a limiting factor regarding the spectrum of beneficial microbes present in brand-name kefir. Studies identified four species of bacteria and three species of yeast, including *Lactococcus lactis* and *Saccharomyces cerevisiae*, respectively. These species work collectively to improve digestive health. By analyzing the probiotic content of various types and brands of kefir, students have taken an innovative approach to understanding the role of the gut microbiotia—opening their minds to cultural awareness, alternative health management strategies, and the scientific importance of fermentation and the human microbiome.

060

The Student Centered Classroom, "Feed Your Microbiome: The New Gut Feeling"

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We implemented an innovative student-centered, interactive learning experience in our microbiology laboratory. The topic "Feed your microbiome – the new gut feeling" lends itself to master challenging scientific concepts by contextualizing them through clinical and personal experiences, while learning basic and molecular microbiology skills. To understand student's background and to incorporate their interests into the classroom activities, we conducted a survey using student populations from the University of Florida and Francis Marion University. We asked personal and demographic questions; explored medical backgrounds as it pertains to GI health, looked at their

food habits, and determined their background knowledge about probiotics and fermented foods. Of the 182 study participants, 2/3 of the students (n=125; 66%) reported that they do consume fermented foods, but 86%(n=158) have never made their own fermented food. However, the majority of the students is unaware or does not know much about more recent research like the importance of the gut-brain axis (79%, n=145). Most participants are curious about the topic and want to learn more about the fermentation process (91%, n=167). Our newly developed curriculum incorporates many of the survey questions and provides scientific background and hands on experience teaching fermentation techniques. Students chose discussion topics based on their interest and decide which fermented foods they want to examine. Our learning approach will not just make them succeed in a scientific laboratory environment, but will help to be knowledgeable how to contribute to their own and to their patients' health in case of pre-nursing and -professional students.

063

Building Global Agricultural Perspectives: Learning Outcomes of a Project Abroad

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This poster reports on the goals, format, and learning outcomes of a project-abroad program designed to increase U.S. students' global perspectives on agricultural practices in an emerging economy. Cultivating global agricultural issues through project-based learning abroad is one of the best ways to incorporate global challenges and opportunities into our curriculum that can help develop future agricultural leaders. Sponsored by the ADM Institute for the Prevention of Postharvest Loss at the University of Illinois, a team of twelve students traveled to India in January 2016 to learn about agricultural supply chains for smallholder farms, cultural and technical issues related to postharvest loss, and research and development efforts to improve agricultural practices in India. In addition, Illinois students collaborated with local Indian university students to translate text for instructional videos on preventing postharvest loss into Hindi. The students wrote critical reflections before, during, and after

their experiences in India. Intensive and continuous reflection on such a learning experience is necessary to achieve cognitive goals such as deeper understanding of academic material, critical thinking, and perspective transformation. We analyzed the students' papers using the Global Learning VALUE rubric developed by the Association of American Universities & Colleges, designed to provide a framework for describing undergraduate students' global learning. In our paper we will share evidence and examples of student development in global self-awareness, perspective taking, appreciation of cultural diversity, personal and social responsibility, understanding global systems, and applying knowledge to global contexts. We will conclude with recommendations and "lessons learned" from our experience in coordinating this project.

065

Alternative Course Formats: A Case for Learning

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One way to raise increase student engagement is to provide alternatives to lecture based learning. This research looked at 4 alternatives. Case 1 consisted of instructor-provided theory and framework and 5 professional days. These were site visits looking at operations and learn from their entrepreneurs. The insights and the ability to walk through the process were invaluable learning aids to the students and provided them a context for collaborative learning and student engagement. Students created a business plan for adding a value added enterprise to an existing farm business of their choice. In Case 2, was an interinstitutional distance course. The students worked collaboratively in teams; used technology to communicate orally and in writing, completed projects related to agricultural law and participated in live presentations with team member from both institutions through online technologies. Case 3 was a simulcast course facilitated between NC State and Strossmeyer University in Croatia. Students were grouped in teams of 4, with 2 students from each university on each team. They conducted team building activities, project coordination, presentations, and collaborative learning. Case 4 was traditional course

then concluded with a 17-day field experience. Students were required to conduct research, attend guest lecture sessions, participate in team building activities, coordinate overseas activities, write blog posts, and make presentations to/with a multicultural team and audience. These opportunities for student engagement provided students the ability to build relationships and to practice oral and written communication skills, increasing their employability and skill sets.

069

Ask the (Industry) Expert: Using Modified Delphi Survey Techniques as Part of Course and Curriculum Development

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A key portion of course and curriculum development is the decision of what content to include. This decision is often made by the individual faculty member developing the course or a group of faculty members developing the curriculum. Content decisions should balance breadth and depth of information and skills imparted with the need for certain knowledge and skills by industry, providing students with the needed tools to be successful in the field. Industry personnel are often more familiar with what knowledge and skills are needed by new hires than faculty members. However, industry input in course and curriculum content is not typically sought or used. Thus, the objective of several studies involving course and curriculum development was to improve the content alignment with industry needs by involving industry personnel in the development process. A modified Delphi surveying method was used to develop both a course in food quality management and a curriculum focusing on dairy manufacturing. Experts identified key courses for the dairy curriculum and core concepts for the quality management course from suggested courses and concepts, respectively. The degree of focus for core concepts were also identified. Additional comments from experts were used to refine and focus course and curriculum content to address industry issues. From these results, a food quality management course outline and dairy manufacturing curriculum plan were developed; both are

currently in use. These results show that industry personnel may be used as an expert panel to align course and curriculum content with current industry needs.

072

The Learning Tornado: An Agriscience Comprehension Model

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Researchers at NMSU developed a middle school science comprehension model and are implementing it through an upper division university agriscience class. The purpose for developing this model is to prepare future agricultural educators who effectively address science comprehension in secondary agriscience classes. To operationalize the model with the university students, the lessons they develop to teach middle school agriscience students must incorporate features of inquiry-based learning and experiential education and address three contributing sub-dimensions of science comprehension: science knowledge, science skills, and reasoning abilities. For example, in a greenhouse effect lesson, university students designed two learning activities (experiential education). The first was a role play where the secondary students played different contributors to the greenhouse effect (science knowledge). The second was building mini greenhouses with different heat trapping layers to demonstrate the greenhouse effect. University students had the secondary students formulate hypotheses on temperature and three-week plant height with different layer treatments (inquiry-based learning). Students took temperature measurements using a thermometer probe and metric height measurement on plant growth (science skills). At the end of the experiment, students accepted or rejected their hypotheses based on the data and drew conclusions (reasoning abilities). Data from middle school students indicates that the model is effective at closing the gap for students performing below grade level in science. The authors believe that using this model with repeated agriscience learning opportunities will create a three dimensional spiral of expanding science comprehension over time, shaped much like a tornado.

074

Exhibitor Evaluation of a Community-Based Agricultural Literacy Program

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Community based agricultural literacy programs are effective pathways to informally teach the public about agriculture through agricultural professional interaction. Such programs are generally evaluated using attendee feedback, excluding the exhibitors' experience. The purpose of this study was to explore the exhibitors' experience at Mealani's Taste of the Hawaiian Range. Post event, exhibitors ($N = 35$) were sent an online survey to provide quantitative and qualitative feedback about a new interactive digital scavenger hunt activity and the event, as a whole. Eighteen (51.43%) responded and were coded E1-18. The exhibitors found the digital scavenger hunt to be an effective way to engage (72.8%, $f = 8$) and provide information (81.8%, $f = 9$) to the attendees. Those who participated in the digital scavenger hunt (38.9%, $n = 7$) did so to increase their exposure (42.9%, $f = 3$) and educate potential customers (42.9%, $f = 3$). Those who did not participate (55.5%, $f = 10$) felt they did not have time (60.0%, $f = 6$) or were not interested/unsure of the purpose of the activity (40.0%, $f = 4$). Overall, exhibitors qualitatively reported satisfaction with the event and indicated room for improvement in logistics (E3, E5, E6, E15)—specifically pre-event communication, event flow, and transportation—and event marketing opportunities (E4, E9, E17). Findings will be distributed to the directors for event improvement, to guide marketing strategies, and to better engage exhibitors and attendees in integrated learning activities. The researchers recommend using exhibitor feedback to evaluate and improve similar agricultural literacy programs.

075

Can Student Publications and Conference Presentations Be Used as an Assessment Tool?

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Undergraduate students of Kauai Community College (KCC) have been researching Kauai-specific Integrated Pest Management (IPM) techniques through testing locally available non-chemical approaches such as vermicomposting and cover cropping since 2012. These IPM-related student projects are part of an internship course, Plant Bioscience Internship (PBT 290V), offered to partially fulfill the requirements for an Associate Degree in Plant Biology and Tropical Agriculture (PBT) at KCC. The course student learning outcomes (CSLOs) of the course are (i) to demonstrate the ability to work in a professional setting through an experiential-learning environment, (ii) to maintain a journal detailing an internship project, and (iii) to develop a written and/or oral professional presentation detailing an internship project, results, and experiences. In 2015, students conducted seven internship projects. CSLOs were assessed and assessed CSLOs were recorded on the KCC designed Course Assessment Report of Data (CARD) records. Internship findings informed six abstracts and two full-text articles published in peer-reviewed journals. Conference attendance by students and student publications could serve as indicators for assessing an internship course in undergraduate students' education.

076

Establishing Study Abroad Programs with Agricultural NGOs for North American Colleges of Agriculture Students to Gain Academic, Experiential and Transformative Knowledge: Opportunities and Challenges

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Non-Governmental Organizations (NGOs) provide crucial social and other services around the world. NGO sector also plays vital roles in promoting agricultural production through cooperatives and other support organizations. Learning about agricultural and other related NGOs in developing countries through academic credit courses and flied visits is an emerging area of study abroad. Gaining knowledge about operations of such NGOs can be rewarding for students of colleges of agriculture, especially in understanding global food systems and agricultural production. Objectives of this presentation are: (i)

to highlight the academic, experiential, and transformative learning outcomes of study abroad programs that work with agricultural NGOs in developing countries, and (ii) identifying opportunities and challenges of developing such study abroad programs. The paper will present the analysis of a survey conducted with 18 student participants of the study abroad program "University of Florida in India: NGOs and Development" that was offered in Summer 2015 by the College of Agricultural and Life Sciences, University of Florida. This six-credit study abroad program visited 18 NGOs, several of them agriculture-related organizations. The survey was designed to understand educational outcomes of the participants. Further, logistical efforts and networking with NGOs that preceded this successful study abroad program will be discussed. Some potentials and issues in developing similar study abroad programs will also be presented. Gaining knowledge on agricultural production and food systems in various countries can be a powerful learning outcome for students of colleges of agriculture. This presentation focuses on promoting such knowledge through study abroad programs.

077

Lights, Camera, Action: Using Interview-Stream to Prepare Students for Webcam Job Interviews

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Employers look for specific skills when interviewing potential employees. Educators have been preparing students for the face-to-face interviewing process for years. With the availability of computers and audio/visual technology, preliminary interviews are often now being conducted via webcam. There are similarities and differences to these two interviewing scenarios. As webcam interviews become more widely used, educators need to prepare students to confidently interview face-to-face or via webcam. Furthermore, employers indicate interviewing skills and preparation are more important than experience when recent graduates interview for jobs. The purpose of this innovative teaching approach was to engage students in a webcam mock job interview in addition to a face-to-face interview assignment in a professional presentations class (N = 50). This study aimed to strengthen student's interviewing skills and confidence by using the Interview-Stream website to facilitate mock webcam interviews and determine students' satisfaction with the assignment. Students completed a webcam mock interview and a satisfaction instrument on this new assignment in relation to the conventional face-to-face mock interview assignment also completed as part of the course. Results from the satisfaction instrument indicate students believe the webcam interview helped them prepare for real interviews in the future. Although they agree the webcam interview enhanced their learning, students preferred to interview face-to-face rather than via webcam. Some students encountered technical difficulties when completing the assignment, resulting in frustration. Instructors should recommend a location with audio/visual capable computers available, such as the library, for the students to complete the assignment if they encounter difficulties.

078

Demographic Survey of Animal Science Students Highlights Mismatch Between Experiences and Career Goals

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A survey of University of Illinois Animal Science students was undertaken to improve faculty understanding of student demographics and inform career advising strategies. Using an Institutional Review Board-approved survey protocol, data were collected in 4 consecutive spring semesters (2013-2016). Within the first week of a required animal nutrition course, designed for the sophomore level, students provided anonymized responses to 18 demographic questions in class via i>clicker remotes. The survey results suggest a relatively consistent population with the majority of students being females (83%), from Illinois (90%), and raised in urban (19%) or suburban (49%) settings. While on campus, the majority of students' work (56%) or volunteer (19%) part-time. Interestingly, smartphone usage increased from 74% in 2013 to 98% in each of the last 2 years. Most students (87%) had been raised with an indoor pet, but 72% of students had never been involved with either 4-H or FFA. The faculty

perception is that nearly all animal science students want to achieve a DVM, an average of only 57% of respondents expressed this intention. With regard to the area in which they had the most direct veterinary experience, students selected: mixed (both large/livestock and small animal; 39%), small animal only (26%), large/livestock animal only (18%), and exotic/zoo (17%). However, when asked to choose their preferred animal industry for a career, students selected: exotic/zoo (47%), small animal (28%), livestock (19%), and equine (6%). This suggests a mismatch between Animal Science student experiences and career goals with respect to careers in veterinary medicine.

080

Student Learning with and Without Answers to Teaching Allowed Paired Problem Solving

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Teaching Allowed Paired Problem Solving (TAPPS) is a problem set which covers material addressed in class lectures and labs. To complete TAPPS, pairs of students alternate between problem solver and listener as they answer the questions on the problem set. Answers to TAPPS questions may or may not be given; though, students are expected to use TAPPS to study for quizzes administered at the following class meetings. This study assessed the hypothesis that student achievement declines on quizzes when answers to TAPPS questions are provided. To assess this hypothesis, student perception of the value of TAPPS and student achievement on subsequent quizzes, with and without answers to TAPPS, were evaluated. Students perceived TAPPS as valuable, but agreed that TAPPS with answers given is more valuable than without answers.

081

Teaching Science through a Video Production Course

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This study assessed how college student producers of research videos for public audiences learned about science content and science communication during the video production process. Survey participants were students enrolled in a combined undergraduate/graduate class on agricultural media production. The class focused on video production of current research by university scientists. Students worked with researchers over the semester to produce short videos. The videos are displayed at a permanent display at the state's Museum of Natural History. The surveys were designed and administered by the course instructor over three spring semesters in the years 2013, 2014, and 2015. Both Likert-type and open-ended questions addressed students' self-perception of science knowledge and video production knowledge prior to and after class activities. Students showed significant improvements in self-reported video production skills and self-perception of science knowledge after completing the class. Open-ended responses supported the statistical results for both science content and video production skill. Results indicate the video production class is effective at improving students' knowledge of both science content and video production. The researchers recommend agriscience instructors include assignments in agricultural science courses that allow students to consider how science content can best be communicated to various audiences. Also, communication skills methods, such as video production or social media, could be infused in agriscience courses to allow students creative ways to interact with researchers and to communicate science.

083

A Celebration of Diversity: Heritage Plants

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In 2015, US News & World Report ranked The University of Hawaii at Hilo as #1 for Campus Ethnic Diversity among National Liberal Arts Colleges. To celebrate this, UH Hilo's beginning class in horticulture, Horticulture 262: Introduction to Horticultural Science has a heritage plant assignment. Students are asked to: a) choose: a

country or region of the world of their heritage; b) choose a vegetable or plant of their heritage; c) search the web for a topographic map of the region or a map showing where the plants or vegetables are grown; d) write a 2-page paper describing the plant or vegetable and how it is grown; e) include the map in their paper; f) include a recipe or how the plant or vegetable is used; g) try to order seeds or obtain plants to grow in their garden. This assignment is much enjoyed by the students. To share the learning, we are copying the papers and distributing them to all students in the class. Examples of countries and plants include: Virgin Islands/Malabar spinach, France/green beans, Japan/daikon radish, Hawaii/kalo or taro and China/Chinese cabbage.

086

Students Gain more Knowledge from Hands-On Learning Activities than Traditional Classroom Lecture

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Hands-on learning is beneficial to the agriculture industry because it allows students to practice and apply tasks in real-world scenarios. Hands-on learning can be time consuming and expensive, but is commonly thought to be more beneficial to prepare students for future careers than traditional classroom lecture. Our objective was to determine student knowledge gained from traditional lecture compared to a hands-on learning activity completed after the lecture on the same topic. Research was conducted on two hands-on topics during an introductory horse science class in fall 2015 (n=56, 10 males and 46 females). For each topic, students completed a pre-test prior to traditional classroom lecture over the material, then a post/pre-test was completed after traditional lecture exposure to the topic. The students then participated in a hands-on learning activity during a laboratory session and took a post-test after the hands-on learning activity. Test scores showed no difference between the pre- and post/pre-test scores, which indicated knowledge gain from lecture only (Pre: 36.11 ± 23.92, Post/Pre: 57.36 ± 20.4; P = 0.56). Students scored higher on the post-test compared to the post/pre which indicated knowledge gain from a hands-on learning activity (Post: 81.02 ± 16.99,

Post-Pre: 57.36 ± 20.4; P < 0.0001). Findings indicate that students benefit from hands-on learning activities and may have increased their knowledge as a result of the hands-on activity compared to traditional classroom lecture over the same topic.

089

Impactful Themes of a Leadership Academy Experience

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Campuses across the nation are providing academy style opportunities in an attempt to develop students' leadership abilities. This case study focused on the Litton Leadership Scholars program which is a year-long undergraduate leadership academy and asked the central question of what made the leadership academy experience impactful. Interviews were conducted based on a purposive convenience sample with members of the past three cohorts. Five themes emerged as central to the study. 1) Participants identified with the Jerry Litton family who embodied the 13 leadership constructs discussed in the academy. Being able to personally identify with these individuals helped increase their ability to understand leadership within a context. 2) Participants described the sense of community in the academy as valuable. This allowed them to express ideas more freely and enhanced the learning environment. 3) Structure of the program allowed for a multitude of networking opportunities. Networking included interaction of students, faculty, mentors, and business individuals. 4) Participants did not apply to the program on a whim, there was a specific reason they applied. They either had a person directly encourage them to apply or they had heard of Jerry Litton. 5) Participants noted the year-long length of the program was beneficial. It allowed time for reflection on personal growth and provided them a chance to apply their leadership skills. Recommendations for practice include providing a relatable context for the leadership education, developing a feeling of community, capitalizing upon networking, and providing time for reflection on personal growth and application of skills.

092

Agripharmatech Student Ambassadors Introduce Advanced Plant Biosciences to Windward Intermediate and High School Students

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Windward Community College's Agripharmatech Student Ambassadors conducted surveys and demonstrations in advanced plant biosciences for Windward District intermediate and high school students on January 29, 2016. The objective of this study is to investigate students' interest and how likely they would be to take college agribiosciences after participating in hands-on activities. Activities involved nutraceutical products, bioengineered bacteria, microscope observation of plant tissues and cancer cells, orchid tissue culture and pest control, and plant DNA extraction. Thirty-seven percent male and 41% female out of 48 intermediate students, and 32% male and 29% female out of 61 high school students indicated that their interest level in plant sciences increased after hands-on participation in advanced agribioscience activities. Thirty-four percent of all students indicated increased interest in advanced agribiosciences. This suggests that it would be most effective to introduce and capture their academic interest at an earlier age while at the intermediate level before being exposed and committing to other fields of study in high school. Forty-one percent of students who reported an increased interest level indicated that phytobiotechnology was the most interesting topic, followed by 34% for microscope observation, and 13% most interested in ethnopharmacognosy. Twenty percent of high school students who had increased interest in plant sciences, however, indicated that ethnopharmacognosy was the most interesting subject. Perhaps because it is a relatively new plant-food-health related technology recently introduced. Eighty-seven percent of students from all grades and various schools on the Windward side of Oahu indicated that they would consider the study of plant sciences at the college.

093

College Students Share Knowledge to Improve Student Attitudes Toward Animal Welfare and Develop Employment Skills

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With the public being further removed from the farm and exposed to negative media associated with animal welfare, it has become increasingly important for the animal agriculture industry to start educating tomorrow's consumers today. The objective of this study was to offer college students the opportunity to share knowledge with school-age children and the public, via hands-on learning environments, to see if it would positively encourage attitudes toward agriculture and develop valuable employment skills in the process. College students (n = 23) were given an 11 question survey and were asked to respond using a, 5 point, Likert-type scale with attitude response options ranging from 1, "strongly disagree/no knowledge," to 5, "strongly agree/very knowledgeable." Students were surveyed pre- and post-test, for three semesters. Data were analyzed using an independent-samples t-test. Surveys reflected an increased tendency (P = 0.06) in student knowledge of animal welfare, animal welfare advocacy, educating the public on agriculture practices, interest in agriculture education, and understanding consumer perceptions on meat purchasing. Students also tended (P = 0.06) to be more positive toward giving presentations and learning to communicate in a job setting. Therefore, allowing college students to educate others may positively influence attitudes toward animal welfare and assist in developing important employment skills.

094

Outcomes from a Dialogue about Diversity in a Graduate Learning Community

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Supporting underrepresented students' persistence and success in the agricultural field continues to be a struggle for the profession. One intentional learning community fellowship program actively supports graduate students from underrepresented communities at a Predominately White Institution by utilizing Intergroup Dialogue andragogy during a regular meeting. Intergroup dialogue is a public process designed to involve individuals and groups in an exploration of societal issues such as politics, racism, religion, and culture that are often flashpoints for polarization and social conflict. This intergroup dialogue involved interdisciplinary learning as graduate students were from various disciplines within a college of agriculture. A content analysis of student reflections along with field notes and program evaluation revealed the following outcomes from the dialogue format: deep processing of their own identities, greater awareness of privileged and marginalized groups at the university, realization of shared struggles between group members, fostered community building, and a desire by participants for continued conversations on the topic of diversity/climate. This dialogue setting can serve as a bridging mechanism through which agricultural educators may utilize to explore departmental, college and institutional climate. Intergroup dialogue has been applied to conflicts around topics of race and ethnic nationality, sexual orientation, religion, and culture. Intergroup dialogue is defined, examples given of how intergroup dialogue has been applied to conflicts around topics of race and ethnic nationality, sexual orientation, religion, and culture, and learning outcomes (both intentional and unintentional) and professional practice suggestions are shared for agricultural educators to use intergroup dialogue.

095

Incorporating an Industry Focus Group to Assist in Developing a Master of Agriculture Degree in Sustainable Agriculture and Food Environment

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Increasing numbers of small-scale agricultural producers have developed successful market niches that involve personalized, direct contact with their customers. The US Bureau of Labor indicated horticulture and organic food production to be among the fastest growing facets of agriculture, while farmer's markets aid in filling the demands of urban consumers with locally grown desires. Consumers are increasingly focused on origin, food safety, and question some traditional practices of food production. Aware of this trend and number of small-scale land owners without content specific knowledge, the Agricultural Sciences program at Sam Houston State University was inspired to develop the frame work for an online master degree program to educate this growing population of producers and educators in this specialized food production system. The degree focuses on non-traditional areas of agriculture, applied learning practices and alternative production options. An external review committee consisting of personnel from federal and state entities, organic food producers, lending institutions and beef marketers evaluated the department's vision. The group overwhelmingly agreed that a degree would be valuable and desired by small-land owners, organic producers, extension agents, secondary school agriculture teachers, and non-traditional livestock producers who seek higher learning. They further noted the changing landscape of agriculture and increasing urban population has led to a greater demand for learning about sustainable practices, urban and organic food production, alternative livestock enterprises, and food safety. The degree directly addresses needs, with courses that include: soil ecology, food safety and regulation, sustainable energy and resources and alternative agricultural enterprises.

098

An Instrument to Determine Teachers' Perceptions of College and Career Readiness: 21st Century Knowledge, Skills and Dispositions (21st C- KSD)

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To assure future competiveness in the global economy, student preparation for the demands of the 21st century workforce has become a collaborative effort amongst business and education

professionals. The purpose of this research was to develop an electronic mail instrument, using the Borich (1980) model to determine teachers' perceptions of college and career readiness. A literature review was conducted to develop the constructs of interest used in the instrument. Constructs provided a set of research-based skills for teachers to indicate perceived level of proficiency, importance, and responsibility to teach the competency. A Likert-type scale of no, low, moderate, and high importance, proficiency, and responsibility was utilized. The instrument was reviewed by an expert panel for face and content validity. The instrument was administered to a population of secondary teachers. Respondents were representative of Career and Technical Education (CTE) and Non-CTE teachers. Cognitive interviews were used to determine accurate response processes. Minor changes were made to improve clarity of the instrument. Cronbach's alpha reliability coefficients were calculated at α = *0.58 - 0.96*. Factor analysis was conducted, changes were made, and results indicated final α = 0.91 for proficiency, α = 0.72 importance, and α = 0.94 responsibility. When measuring variables of personality, reliability coefficients of 0.60 to 0.70 are acceptable. The results of this study indicated the 21st C-KSD instrument was a reliable measure of teachers' perceptions of college and career readiness. Recommendations were made to utilize the 21st C-KSD in future research to determine teachers' perceptions.

100

Student Perceptions of Immediate Feedback while Taking a Test

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Undergraduates (N = 44) completed a 10-item multiple choice exam in an agricultural systems course using Immediate Feedback - Assessment Technique© (IF-AT) cards. For each question, students "scratched off" the letter (A-D) of their answer; a star was revealed if the answer was correct. A questionnaire was administered immediately after the exam to determine perceptions of the IF-AT exam method. A majority (81.8%) of students indicated they had never used IF-AT cards prior to the exam. Majorities of students agreed (combination of "agree" and "strongly

agree") they liked the immediate feedback provided by the IF-AT cards (93.2%), enjoyed using the IF-AT cards (86.4%), preferred using the IF-AT cards over traditional exams (79.5%), became more confident of their subject knowledge using the IF-AT cards, (77.3%), wished IF-AT cards were used in more courses (68.2%), and were less anxious about taking the exam because IF-AT cards were used (54.5%). Students were least likely to agree they had learned new information (50.0%) or had corrected misconceptions about content (40.9%) while taking the exam with the IF-AT cards. However, given the mean test score of 80.7% (SD = 14.4%), students had limited opportunity to learn new material or correct misconceptions due to their already solid understanding of the content. The questionnaire also asked students to estimate their test score; the mean estimate of 83.5% (SD = 11.4%) was not significantly different from the actual mean test score, t(43) = 1.39, P =0.90. These results support increased use of IF-AT cards in college courses.

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Publication Patterns of Forestry Graduate Students: A Case Study from Virginia Tech

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Scientists are often introduced to the process and culture of disseminating research in peer-reviewed scientific journals through the publication of their graduate thesis and/or dissertation. In this study, we examined publication patterns of forestry graduate students. We were interested in documenting potential differences in publication rate depending upon degree (masters vs. doctoral degree), decade of graduation (1970s – 2000s), and faculty advisor. We examined 40 master's projects, 486 master's theses, and 166 doctoral dissertations from the forestry program at Virginia Tech, a land grant university with a strong forestry program. At Virginia Tech, 15% of non-thesis M.F. students publish their graduate projects as a peer-reviewed scientific articles; 40% of M.S. students publish their thesis work; and 66% of Ph.D. students publish their dissertations. There was an increase in publication rate

of graduate research across the four decades examined. In the 1970s, 27% of graduate students published their thesis or dissertation, but by the 2000s, 57% of graduate students published their thesis or dissertation. For faculty members who advised at least ten graduate students, there was a wide range in publication rates, with the lowest rate from a faculty member who published 8% of their graduate students to the highest rate from a faculty member who published with 85% of the students they advised. The results of this study help faculty establish reasonable expectations when advising graduate students, documents the trend of rising expectations for publication, and identifies the importance of faculty advising in publication patterns of graduate students.

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Adapting the Forest Management Planning Process to an Educational Plan Development at Virginia's Middleburg Agricultural and Research Extension Center

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The Middleburg Agricultural Research and Extension (MARE) Center is located in Virginia, west of Washington, DC, and is owned by Virginia Tech. The Center is used for equine and pasture research. The Wankopin Nature Trail, on the Center, currently lacks educational strategy and material. By virtue of the trails accessibility, community interest and overall appeal, it holds significant potential to reach new audiences with basic natural resources educational content. We present a plan for improving the educational value of the trail and the educational process of collaborating with the MARE Center. First, we explain how new maps and forest inventories were produced to establish a planning foundation. Next, we show how an advisory committee provided historical context, overall project goals, and iterative input to the project. Together, this allowed us to follow an adaptive management structure to create an experiential learning framework based on the ecology, context, and setting of the trail. The trail theme focused on sustainability and renewability of natural resources in society to increase awareness and knowledge of trail visitors. Constraints to the development of the trail include: finances, labor, and maintenance. We conclude with suggestions for the MARE Center to continue exploring partnerships to implement the new educational plan, including collaborations with the Boy Scouts, local environmental groups, and local area schools. Other Agricultural Research and Extension Centers maybe be able to improve the natural resources educational potential of their lands through a similar partnership between Center leadership and natural resource professionals.

103

Therapy Dogs Helping Students Reduce Stress

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College is stressful for students, especially at peak exam time. An internet search for "final exams and college student stress" yielded over 300 million results. Another well documented phenomenon is the benefits of interacting with a companion animal for stress relief. The interaction not only lowers stress but is documented to lower heartrate and blood pressure. A review of the relevant literature shows hundreds of colleges and universities across the United States implementing therapy dog assisted activities to help their students during stressful periods. Research provides significant findings that interacting with therapy dogs during finals week reduced student stress as compared to a control group that did not interact with therapy animals. A trial therapy dog program was conducted at Sam Houston State University during midterm of the fall 2015 semester. A tent was set up in a common student area in conjunction with counselors from the university counseling center and 5 dogs available for student interaction. Many students expressed their appreciation verbally and were smiling while interacting with other students and counselors. Over 300 students stopped by to engage with and pet the animals while over 100 of those students spent 10 or more minutes interacting with the dogs. The students stated the dogs allowed them to alleviate some of their stress and made them feel happier. Academic Community Engagement (ACE) is a classroom enrichment that combines community engagement with academic instruc-

tion. This therapy dog program is being implemented into the Animals and Society course as an ACE initiative.

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Teaching in Innovative Spaces: Curriculum that Complements the Space

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Departing from the typical classroom environment provides an opportunity to enhance student engagement and learning. Teaching effectively in innovative spaces required adjustments to conventional curriculum. In both spaces, active learning was utilized more than lecture. Webster 101 enhanced student-student interaction by seating eight students per table, facing one another. The instructor was deemphasized in this physical arrangement. Each table was configured with audio/video input so students can connect their own mobile device to the 52" LED HDTV monitor next to the table. Students completed case-studies to apply course content to professional settings. They worked collaboratively on electronic documents and used online resources during class. The active learning components provided students with relevant, "real-life" applications of course content. Sakamaki D102 offered floor-to-ceiling writing surfaces. The agile furniture in-cluded stools, small tables (similar to coffee ta-bles), and tiered modular stadium seats. In this space, students were at ease during class discus-sion and group-work due to the relaxed design of the seating. We discussed a popular, yet contro-versial, diet book and tied the book to nutritional biochemistry content from class. The relaxed en-vironment in this teaching space allowed us to have very effective class discussions. Students used the expansive writing spaces to create vis-ual aids for informal group presentations and to create their own "metabolic map," which commu-nicated all of the key pathways for macronutrient metabolism. The innovative spaces allowed for more organic interactions among students and in-structor alike and provided an opportunity for cre-ative, effective educational experiences.

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Analysis of Identifiers of Vocational Identity of Animal Science Undergraduates

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Undergraduate students often struggle in their efforts to establish their own vocational identities, which can lead to career decisions that do not correlate fully with their strengths, desires, and goals. This qualitative study was aimed at better understanding how animal science students at the University of Illinois describe their identities on a professional level. Two reflective assignments from a required undergraduate seminar course were used in a thematic analysis of the identifiers that these students (n = 30) used to describe their vocational identities. Each student completed both assignments. Identifiers were grouped into five themes, reflecting 20 subcategories that contribute to the development of vocational identity. The themes most commonly identified for the Draw-Your-Life assignment were, in descending order, Occupational, Interests/Strengths, Institutional, and Social. For the Autobiography assignment, the most common identified themes were, in descending order, Occupational, Institutional, Social, and Interests/Strengths. Within the Occupational theme, students focused on Animals as the main identifier subcategory on both assignments, followed by Future Job. Vocational identity was influenced by vocation, but also by social and institutional factors, as well as elements of the student's interests and strengths. These results may allow educators in animal sciences to more effectively focus their efforts in helping students develop professionally and make effective career decisions. In addition, the study provides an analysis of two types of reflective assignments that may be used to reveal identifiers of students.

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Cultivating Professional and Engaging Social Media Voices

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Social media platforms have revolutionized consumer engagement. Agricultural advocates have effectively used social media to engage audiences, provide beneficial information, and increase awareness of agricultural issues. However, not all social media is professional and engaging. What principles can instructors help students learn so they can cultivate a professional and engaging social media voice? This qualitative study included semi-structured interviews with five social media strategists working in agricultural communications, public relations, and marketing industries in Texas. The interviews were analyzed using a qualitative content analysis approach with an open coding technique. Students can begin to cultivate professional and engaging social media voices through accuracy, honesty, independence, impartiality, accountability, respectfulness, and excellence. Disseminating research-based, factual information is pivotal to developing a professional voice that begins with developing personal personas and identifying biases. Before engaging in conversation, students should read and seek information, seek to be professional and not uptight, analyze the meaning behind information, engage with potential influencers, and listen to their audience. Fundamentally, students must have a passion for agriculture, use appropriate hashtags, and maintain professional bios focused on personal and professional positives. Such professionalism establishes a digital and personal reputation. Social media platforms have become important communication tools because of cost effectiveness and ability to reach broad audiences efficiently and effectively. However, to increase trust and engage consumers, students who seek to disseminate information on social media platforms need to focus on cultivating professional and engaging social media voices instead of just having a presence on all social media platforms.

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Focusing on Partnerships for Faculty-Led Study Abroad Programs: Examples from Pennsylvania State University's Ag2Americas Initiative

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In-country partners are vital to support faculty-led study abroad programs and selection of a partner requires careful consideration for each program. Existing programming materials that support the creation of embedded courses suggest the importance of in-country partnerships, but do not explore the various types and how those differences can impact the experience. Partners have local knowledge and resources, which can greatly contribute to meeting the learning goals of the program. Partners can also facilitate program logistics and contribute to the safety and security of students, and allow faculty to focus on in-country teaching. Penn State's Ag2Americas Initiative features three types of in-country partnerships in for faculty-led study abroad programs in Latin America: for-profit, non-profit and personal networks. Each type of partnership has different strengths and weaknesses, which will vary depending on the objectives of the course. Non-profit partners, such as research institutions or universities, can pair faculty with in-country researchers, but may not be as strong on logistical planning. For-profit providers are often excellent in organizing logistics and creatively fostering a hands-on environment, but some providers lack breadth and depth of agriculturally-related connections. Personal networks allow faculty to build on existing relationships and encourage collaboration, but managing logistics can be stressful and distract faculty from in-country teaching. This presentation is geared towards those interested in faculty-led study abroad programs and is intended to explore the types of partnerships available that can be used to meet the learning goals of international experiences.

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Farm Experiences Program: Experiential Learning in Agriculture with Local Farmers and Growers

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The average farm size in the United States is increasing and the numbers of farm families are decreasing. Interestingly, the number of undergraduate students who major in agriculture and related fields are increasingly coming from non-farm families. This holds even high in minority

serving institutions like Delaware State University. Data was collected through pre survey questionnaire randomly from 46% of the students from the college of agriculture and related sciences. In the survey all levels of academic classes were included and are majoring in general agriculture, animal and poultry science, environmental science, Ag-business, Pre-Veterinary Science and wildlife management. Survey results revealed that 75 % of the students had no prior experience nor were exposed to farming environment. Over 92% of the students believed that having farm experience will enhance their knowledge in their majors. For the past three years we have provided summer internship opportunities through the Farm Experiences Program (FEP) to 20 undergraduate students majoring in agriculture and related fields. The participants worked with local farmers, growers, and the university research farm gaining experience from dairy farms, vegetable and fruit growers, produce processing, packaging and participating in community supported agriculture. Post survey data from the participants suggests that 80% of them felt that they are more confident and ready for careers in agricultural industry and have deeper appreciation of agriculture. As demand for skilled people in agricultural industry is projected to increase, farm experience programs like this will play a key role in developing talent and leaders in the field.

112

Clarifying the Operationalization of Agricultural Literacy

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The concept of agricultural literacy has existed for three decades. A great variety of agricultural literacy programs have been developed and delivered. Many populations, however, are still agriculturally illiterate. The existing conceptualizations and theories do not answer the following questions: How can an individual become agriculturally literate? What are the components of agricultural literacy? The purpose of this study was to propose a theoretical framework that operationalizes the concept and answers these questions. A literature review generated the following conclusions: The development of agricultural literacy is a comprehensive cognitive process rather than a simple acquisition of knowledge. Four factors are

needed to achieve agricultural literacy: 1) Devices for accumulating agricultural knowledge; 2) Education through institutions; 3) Application of knowledge in life occasions; 4) Rumination and evaluation. Development of agricultural literacy is a continuum. Everything starts with agricultural awareness, which is about acquisition of basic information and forming a basic interest in agriculture. The second stage is pre-dispositions initiation. Dispositions are the individuals' attitudes, concerns and values towards agricultural subjects or issues. The third stage is competences development through application and understanding. The final stage is post-dispositions reestablishment. Individuals may become more favorable or more averse to the subject after having understanding, application and competences. Post-dispositions will influence individuals' future responding behaviors towards agriculture such as advocating the industry. Our framework further clarifies the concept of agricultural literacy. Educators can utilize this framework to develop effective agricultural literacy programs. Stakeholders and evaluators can more precisely evaluate programs by using this framework.

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A Pre-Post-Test of Self- Regulated Learning in a Blended Agriculture Course

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The growth in popularity of online classes creates a need for research targeting self-regulated learning (SRL) in the online environment. Previous research found that there is significant value in SRL to student success, especially in online and blended courses and an individual can change their SRL skills and strategies (i.e. a student is accustomed to studying little before a test). However, it usually takes the student failing a test (environmental feedback) for them to change behavior. The purpose of this study was to measure the impact of a hybrid agribusiness course on student self-regulated learning. The instrument used was the online self-regulated learning questionnaire (OSLQ) and compared six constructs: environment structuring, goal setting, time management, help seeking, task strategies and self-evaluation. Summated scores for this instrument ranged from

24 (low self-regulation) to 120 (high self-regulation). Validity of this instrument was established by previous studies where it has been used to investigate students' SRL in 18 different academic disciplines. An internal measure of reliability resulted in a 0.92 Cronbach's alpha score. In this study, there was little difference in students' pre-and-post-test SRL scores, some scores dropping post-test. The lowest SRL scores were found in task strategies and help seeking. Students had the highest SRL in environmental structuring and goal setting. The moderate summated scores (97 out of 124) suggests students entered the course with an above average level of SRL. This provides evidence that students may need further training in task strategies and help seeking when taking blended and online courses.

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Mechanical Aptitude of Underrepresented Agricultural Science Majors

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Agriculture majors need to have technical knowledge and an acceptable level of mechanical aptitude (MA) to be successful in their future careers. Many organizations use testing of MA in their employment selection process. Testing of these skills allows employers to measure the extent to which future employees have mastered mechanical comprehension. The objective of this study was to determine the MA level of undergraduate agriculture majors using the Bennett Mechanical Comprehension Test (BMCT). The purpose of the BMCT is to measure perception and understanding of physical forces and mechanical elements in practical situations. The BMCT is composed of 68 illustrations of simple, frequently encountered mechanisms. For each question, the participant reads a prompt, examines an illustration and chooses the best of three choices. Possible ranges for the BMCT is $10 - 90$. The BMCT was administered to college agriculture majors. Over half of the students were identified as Hispanic The raw scores were then compared between demographic characteristics. Participants ($n = 100$) scored ($M = 40.6$, $SD = 8.9$) and range of 6 - 63. Scores were compared to normative data of other technical professionals. Students had a low level of MA. No significant

pattern was found between MA and grade classification. Males had a higher level of MA in comparison to females, consistent with previous studies. To increase the scores, it is recommended that the students receive more technical education at the post-secondary level. To create a source of comparison, the BMCT should be administered to secondary students in agricultural courses.

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Utilizing a Modified Photo-Elicitation Technique to Teach Complex Agricultural Concepts

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For many educators, understanding how students organize their understanding of a complex concept and connect it to the world around them is paramount in cultivating student success. One method which can be helpful in this cultivation is the high-impact activity of photo-elicitation. Researcher-generated photo-elicitation interviewing technique, as a qualitative research methodology, asks participants to utilize photographs to aid in their expression of thought about a specific research objective. Taking this research method and modifying it for the classroom, photo-elicitation allows students to show a representation of inherent meaning about a complex agricultural concept. This presentation will not only convey modification techniques and ideas for methodological course integration, it will share specific student examples, and lessons learned from the activity. The methodological objective of the assignment was to use photo-elicitation as an original way to gain cognitive and emotional insight into students' conceptualization of agricultural leadership in action. Instead of giving students photographs to analyze for content, as is done in the research technique, students were challenged with taking a photograph which showed their conceptualization of "leadership." Students then wrote a one-page reflection paper explaining their photograph, outlining why they chose to take the photograph, and discussing how it demonstrates their understanding of the concept of "leadership." This modified photo-elicitation method not only challenged students to find an example of the concept in their world, it urged them to critically think and reflect on how this

complex concept is seen through their personal "lens."

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Influences on Students Choosing Majors in Agriculture

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Structural equation modeling (SEM) analysis was used to examine independent variable constructs of student characteristics, environment, learning experiences, and task approach skills from Krumboltz's social learning theory of career decision making on the decision of students to choose an undergraduate major in agriculture. Variables were identified through previous research in field of study choice in agriculture and data was evaluated from the NCES Education Longitudinal Study beginning in 2002. Using Exploratory Factor Analysis, the students' characteristics of gender and race/ethnicity did not fit in a pattern, however, students' GPA did load under a new students' goals construct. Learning experiences and students' goals were similar to Krumboltz's constructs of learning experiences and task approach skills, but the environment construct was divided in the study model into three constructs of parents' goals, parents' education, and influential people. The final SEM model fit adapted from the Confirmatory Factor Analysis met the recommendations of a good fit with a Chi-square of 2.09, a RMSEA of 0.05, and a PCLOSE of 0.35. The influence of parents was evident, for example parents' goals having the highest item total correlations (r = .46 and .50), yet less than one percent of parents indicated they had an occupation in agriculture. With the small percentage of parents directly employed in agriculture and the significant amount of influence parents have on field of study choice, coordinators of recruitment and awareness programs are encouraged to include parental involvement in their practices and learning experiences.

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You Could do Better: Developing Improved Outcomes for Global Education Programs

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It's no small act: packing up one's life for a time, traveling thousands of miles to a different region of the globe, and engaging with people in a very different environment. It is a wonderful opportunity for international collaboration and enhanced intercultural understanding. It also has the potential to be a destructive environment where students can gain skewed perspectives and people in a local community can be degraded or patronized. There are many parties involved in international education programs, this presentation will focus on the three most salient parties – students, educators, and communities receiving students. As a result of reviewing this poster, participants will be able to identify relevant inputs, processes, and outputs of a global education program and critically examine the structure of such programs to optimize the outcomes for all parties. This poster will explore the scholarly literature related to the inputs, processes and potential outputs of education abroad and service-learning programs around the globe. By beginning to understand the whole process we are able to ask critical questions about the structure, design, and objectives of such global education programs and ultimately design better programs. Before we embark on international partnerships we must ask who makes the decisions about the projects in the community, who has the agency, and who holds the power in the relationship. It is through understanding the concepts of power and agency that healthy and active intercultural collaborations may be built and greater outcomes will be achieved for students and communities.

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Self-Efficacy and Career Commitment as Predictors of Achievement in a Food Chemistry Course

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FDSC 4304 - Food Chemistry is a split-level, required course for Food Science majors. Historically, a significant number of students have struggled in this course. The instructors recognized the need for a method of identifying potentially at-risk students early in the semester, but, because many students are either undergraduate transfer students or entering graduate students, prior academic information is often not available for many students. The purpose of this study was to determine if student scores on an instrument assessing students' chemistry, mathematics, and academic self-efficacy and food science career commitment could predict a significant amount of variance in FDSC 4304 grades. Thirty-two students completed the instrument during the first week of classes in fall 2015. Academic self-efficacy ($r = 0.40$) and career commitment ($r = -0.35$) were significantly ($P < 0.05$) correlated with FDSC 4304 grades; self-efficacy in mathematics ($r = -0.01$) and chemistry ($r = -0.05$) were not significantly related to FDSC 4304 grades. A linear combination of academic self-efficacy and career commitment explained 30% of the variance in FDSC 4304 grades, $F (2, 24) = 5.15$, $P = 0.01$, $R2 = 0.30$. Squared semi-partial correlations indicated academic self-efficacy explained 17.6% of the unique variance in FDSC 4304 grades while career dedication explained 14.1%. We concluded scores on the academic self-efficacy and career commitment scales could be useful in identifying students potentially at-risk in FDSC 4304; however, additional measures are needed. Finally, the negative relationship between career commitment and FDSC 4304 grades should be examined.

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Making Sense out of Food: Sensory Stimulation as an Instructional Approach

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A new Special Topics in Food Science and Technology course entitled Foods Unwrapped was developed to allow students to engage in active learning while learning about various food products in terms of origin, types, production, and current topics/issues. The goals of the project were to deliver course content in a creative way to maintain students' attention and encourage student participation. Six food product categories (i.e. coffee, tea, cereal, yogurt, frozen breakfast foods, and pickled foods) were discussed in the course as units. Sensory stimulation for the five senses of sight, smell, touch, taste, and hearing was incorporated in each unit using PowerPoint presentations, visual aids, videos, instructor-led discussions, student-led discussions, personal response systems (i.e. clickers), in-class activities, and sensory evaluations. Students' perceptions of their learning experience was assessed via an anonymous survey administered at the end of each unit and at the end of the course. The course was assessed using The University of Tennessee Student Assessment of Instruction System (SAIS). Students ($n = 15$) perceived the course to be more hands-on, fun, and enjoyable than other courses that they enrolled in. Sensory evaluations and PowerPoint presentations were perceived to be the most beneficial forms of sensory stimulation for learning. Students found sensory evaluations and videos to be the most satisfying. While some students didn't have any recommendations for improving the course, two recommendations were to incorporate more clicker quizzes and select different food products. The researcher plans to offer the course again during Fall 2017.

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When Life Can Imitate Art: Using Theatre of the Oppressed in Youth Leadership Programs to Enhance Critical Awareness and Community Agency

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Half of all global citizens are under age 25 and youth leadership development programming is important to empower them as agents of change in their communities. Beyond human and social capitals, youth-target programs should enhance participants' cultural and political assets and encourage collective action. Community agency is vital to foster local well-being and research suggest the need to develop relationships and enabling spaces that enhance the capacity of local people to unite and act. The Brazilian Theatre of the Oppressed seems to be a promising contributor toward that, especially because it aims to facilitate individuals to critically understand reality to become able to change it. Our proposal is to

develop a youth leadership program grounded on Theatre of the Oppressed to enhance the participants' social, cultural and political capitals, and community agency. In a participatory approach, the target youth will be engaged in the program planning/design, implementation and evaluation. Using techniques of Theatre of the Oppressed, the participants will be responsible for conducting the needs assessment, setting priorities and objectives of the program, and making decisions upon the curriculum. The curriculum is focused on understanding the community context, agency and development, through critical learning processes where participants analyze their reality and are challenged to recreate that, culminating in a collective production of a Forum Theatre play to be performed to the community. After each performance, the community is incited to debate alternatives to the issues posed in the play, and, then, invited to the stage to act out the solution.

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EWE-TH CONNECT: A Curriculum for Educating Wyoming Youth about the Sheep Industry

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With the average age of a farmer being 57, it is critical to engage youth to actively participate in the agricultural segment. With agriculture being Wyoming's third leading industry, the sheep segment plays a large role in Wyoming agriculture. Wyoming is the fourth largest leading state in sheep production, but the sheep industry has been steadily declining. Currently, Wyoming agricultural youth have the opportunity to participate in three cattle programs; however, there are no sheep programs offered. Surveys were conducted to Wyoming agricultural youth to gage their agricultural knowledge; more specifically their sheep industry knowledge. Research showed agricultural knowledge was the lowest in the sheep segment, as well as showing a need and want for a youth sheep program. The program, EWE-TH Connect, was proposed to offer youth an opportunity to get started or enhance their sheep herd. The curriculum in this two-year program offers educational trainings, seminars and events for youth to gain industry knowledge,

focus on production agriculture and offer incentives, while developing leadership and communication skills. The fellows accepted into the program are required to keep a detailed record book on breeding, nutrition, health and financial information, as well as creating a marketing plan. Additionally, fellows will go on industry-type tours and volunteer at industry-type events. The Wyoming Wool Growers Association has expressed interest in being the parent organization for EWE-TH Connect curriculum with the Wyoming Livestock Genetics Association, the University of Wyoming Extension Service and the Wyoming Agricultural Leadership Council as partners assisting with the program.

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Cultivating Experiential Learning: In sights into the Role of the Farm Operator on the Ag450 Farm

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Since 1943, Iowa State University has offered an experiential learning course in Farm Management and Operation which utilizes a real, working, student-managed farm. This capstone course, Ag450, has been facilitated through the years by a team consisting of professors, graduate assistants/instructors, and farm operators. Much has been written and presented about the curriculum, outcomes, assessments, and involvement/interactions of the students and instructors of the Ag 450 course. However, the impact of the farm operator position, as the third leg of the instructional stool, has yet to be addressed. The purpose of this poster presentation is to address, from the perspective of the farm operator, how this individual enhances the educational processes involved in this capstone setting. The early years of Ag450 were heavily weighted toward production skills. As production has become more automated, the class has evolved to focus more upon interaction with higher order skills such as critical thinking, problem solving, decision making, and communication skills development. The position of the farm operator has also evolved to include a more active educational role including, but not limited to production, production skills, curriculum development, instruction, mentoring, and facilitating student interaction within the experiential learning

activities embedded in the course. Ag450 Farm visitors worldwide have questioned how the role of the farm operator can be adapted in order to be culturally acceptable in various educational settings. The complexity of the farm operator's position and involvement in the educational aspects open many opportunities for adoption and personalization within a capstone course framework.

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Integrative STEM in Urban Communities

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The Growing 4-H Science (G4HS) Program in Richmond, Virginia was developed to create opportunities to engage, educate and empower youth using experiential STEM learning in urban communities. This effort utilized community partners and local and state agricultural resources to develop agrarian-based programs in science, technology, engineering, and math for formal and non-formal learning environments. G4HS provided a cross-disciplinary programming network of formal and non-formal educators who connected youth to statewide commodities through a summer agriculture commodities tour, an integrative STEM learning institute in a formal learning environment and out-of-school time programming. Findings from the two-year study of 1100 enrolled youth in the year-round G4HS programs indicated that 4-H provides opportunities to engage in science (41%), to make and invent (43%) and work on science activities (41.7%). Additional findings showed that youth were excited about new discoveries or inventions (43.5%), got excited about doing science activities (41%) and liked science (71.4%). Sixty-two percent said they were good at science. Fifty percent said that would like to have a job related to science while 54% said that science was useful at solving everyday problems. Using agriculture to initiate education reform is necessary to expand awareness about agriculture, food origin, fresh and local food access, food deserts and sustainable food systems while providing practical and relevant agricultural knowledge and skills to grow healthy youth, families and communities.

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Student Retention through Peer Mentoring in the College of Agricultural and Environmental Sciences at the University of Georgia

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Feeling supported and having high impact peer mentoring experiences helps engage, retain, and support students in colleges of agriculture where attrition is usually higher than in other STEM sciences. To explore this further, a survey was designed to determine the effectiveness of a peer mentoring program among mentees in the College of Agricultural and Environmental Sciences at The University of Georgia. The MAPP (mentoring among peers program) survey consisted of constructs to examine the student's perceived benefits of the program and included: (1) impact of peer mentoring, (2) personal confidence level, (3) learning experience, (4) academic impact; and (5) retention. Sixty-two percent of the MAPP mentees answered the survey. Results indicate that 80% of the respondents agreed or strongly agreed that the peer mentoring program had a significant impact on their first year of college. Results also showed that 73.4% of respondents agreed that their confidence in academics, subject matter knowledge, ability to access student resources, the ability to complete their degree; and the capacity to cope with problems faced while adjusting to college increased. Seventy-four percent of participants strongly agreed that their involvement in the peer mentoring program was a positive learning experience. Additional results indicated that of the students who thought about leaving the college of agriculture before completing their degree (71.4%), the MAPP program influenced their decision to stay (66.7%). Results of this case study have confirmed that peer mentoring is a critical component of student success and retention efforts, especially in colleges of agriculture.

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Experiential Learning Experience of MSP Scholars

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Our project is to train and support five undergraduate USDA Multicultural Scholars Program (MSP) scholars from traditionally underrepresented ethnic populations to help address the issue that majority of traditionally underrepresented groups are not being matriculated in food and agricultural sciences. Scholars are trained in a broad area of urban and community horticulture and local food production with opportunities through rotation on a semester basis in different experiential learning experiences, such as high tunnel, greenhouse, integrated pest management, plant propagation, and forest farming. Data obtained from this project indicate that experiential learning activities have significantly enhanced scholars' overall educational experience and solidified their career interest in horticulture. Our scholars received multiple offers for summer internships and/or research experience opportunities. The scholars' excellence (capabilities of handling the academic rigor and achieving career goals) are demonstrated by their selections as the school representatives attending the University Day with the North Carolina Legislature and Executive Branch, to receive ELITE scholarship, and as an integral part of the University's team to attend and compete at the national MANRRS conference and won the Quiz Bowl. In addition, the scholars have been serving as recruiters, ambassadors and peer mentors to the newly admitted students. Three of the five scholars presented their scholarly experiences at USDA/NIFA in Washington, D.C., and were complimented by the NIFA Deputy Director, National Program Leaders and Program Specialist, and faculties from other 1862 and 1890 land grant institutions. This project success would serve as an excellent model for student training.

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The Children's Healthy Living Summer Institute: An Opportunity for Sustained Pacific Workforce Capacity Development

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The prevention of childhood obesity and promotion of health requires multidimensional approaches, especially in the expansive and diverse Pacific Region. One empowering and sustainable approach to promoting child health is through training and education. The Children's Healthy Living Summer Institute (CHL SI) seeks to elevate the health training capacity of the Pacific region through formal online training that is globally relevant and locally applicable in the Pacific. Through a collaborative effort of institutions across the Pacific, the CHL SI will deliver culturally and regionally appropriate distance curriculum in areas related to nutrition, child health assessment, monitoring, and program development. The CHL SI will be offered beginning summer 2016 through the University of Hawai'i Outreach College, providing students throughout the region or world access to its asynchronously delivered material at an in-state tuition rate. The partnership with Outreach College also provides a mechanism for program sustainability and financial independence through recapture of summer tuition revenue. Multiple assessment modes such as evaluation of student learning outcomes, follow-up of student progress and revenue generation will determine program successes and outcomes. Becoming an accredited certificate program and continuing education provider for the region in child health are long term goals and will increase CHL SI's relevancy to the nutrition, nursing, medicine, or public health professional fields. The CHL SI is a collaborative model for delivering nutrition and health education and outreach to remote areas using distance technology. For further information, visit: http://bit.ly/CHL-SI

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Laboratory Management Professional Development Needs of Iowa Secondary Agricultural Education Teachers

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Current research suggests that over a 20-year period that agricultural education instructors were receiving less training in agricultural mechanics, students had less working space, and had increased student enrollment in the agricultural mechanics programs. In order to create a safer learning environment, secondary agricultural education teachers must be knowledgeable and competent in the area of managing an agricultural mechanics laboratory. This study investigated the professional development needs of secondary agricultural education teachers in Iowa regarding agricultural mechanics laboratory management. The theoretical foundation that guided this study was Bandura's theory of self-efficacy. To further align this theory, we explored the beliefs and one's capabilities to organize and execute one's course of action to manage an agricultural mechanics laboratory. The research objectives for this study were: (1) Determine selected personal, professional and program demographic characteristics of Iowa secondary agriculture teachers who instruct in and manage agricultural mechanics programs; (2) Determine the self-perceived importance levels and ability levels that Iowa secondary agriculture teachers place on agricultural mechanics laboratory management competencies and; (3) Determine the professional development needs of Iowa secondary agriculture teachers regarding agricultural mechanics laboratory management competencies. Results indicated that teachers had the greatest in-service needs in safely disposing of hazardous materials and had the least professional development need in the area of maintaining computer based student academic records.

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Secondary Agricultural Education Student Injuries and Other Accidents Sustained in an Agricultural Mechanics Laboratory

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Agricultural mechanics laboratories are an inherently dangerous learning environment due to the age and experience level of the learners being introduced to the operation of power machinery. The agricultural educators' most important role in agricultural mechanics instruction is to ensure student safety is a top priority. The purpose of this study is to identify the injuries and accidents sustained by Iowa secondary students within an agricultural mechanics laboratory. The theoretical framework that guided this study was the disaster theory. Furthermore, Turner found that a series of man-made disasters presented warning signs that if acted upon could have been averted. Turner's findings suggest that social implications superseded engineering problems, thus indicating that disasters could have been avoided. Results indicated that agriculture teachers spent on average 7.48 hours per week supervising students in the agricultural mechanics laboratory, the average class size was 13 students, the average size of the laboratory was 2403 ft² and the average age of these facilities was 36 years. 82% of respondents received first aid training as well. Additionally, respondents indicated they encountered the following student injuries: 45.8% lacerations, 28.1% abrasions, 11.5% eye injuries, 42.7% burns, 0% broken bones, 1% muscle sprains/strains, 2.1% crushed appendages, 1% severed appendages, 0% hearing injuries, 14.6% slips/trips/falls.

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Evaluation of Student Outcomes and Takeaways from a Food Microbiology Course

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Student outcomes and takeaways from a food microbiology course were evaluated to determine course impact and areas for improvement. At the end of a split-level (undergraduate and graduate) course (required for a B.S.A. degree in Food Science), students were asked to reflect and respond to prompting questions asking about important, interesting, helpful, or distinctive things they learned from the course; how the course affected the way they think about the topic and its value; and what were the most difficult and surprising things they learned. Twenty-six student responses were obtained. They were de-identified and analyzed for trends and valuable excerpts. About half of the students indicated that they had a higher appreciation for the importance of food microbiology due to the course. Half also said that they would apply food safety principles learned in the course to modify their behaviors. Over a third of students stated that they appreciated the hands-on skills and experience they acquired through the lab portion of the course. Nine students expressed an increased interest in the field of study. However, over a third of the class indicated that there was a lot of memorization involved in the course. All components of the course objectives present in the syllabus were mentioned in the responses; this is indicative of course objectives being met. Overall, student satisfaction with the course was high; however, the responses indicate a need to improve the course by incorporating activities that minimize memorization by improving critical thinking skills and using meaningful learning techniques.

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Is Diversity on Their Minds? Perceptions of Diversity in an Agriculture Undergraduate Population Using a Multi-Method Survey

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In an increasingly global society, cross-cultural interactions have become common. Promoting diversity across college campuses can encourage students to engage in their global competence, to better prepare themselves for the workforce. Diversity education relies on understanding the perception of diversity from multiple viewpoints. The goal of the study was to understand the intrapersonal definitions and interpersonal differences of diversity in an agricultural undergraduate student population at a mid-Atlantic university. Based in the diverse learning environments framework, a multi-method survey was created and disseminated to students consisting of open-ended response and Likert scale questions. Survey questions were created based on the constructs of race, socioeconomic status, and culture/environment used to define diversity. Likert scale questions gauged student perceptions of diversity and open-ended questions provided intrapersonal data for defining diversity, what students perceived made them unique, and opinions about efforts to improve diversity and inclusion at the university. Open-ended responses were coded and put into themes. Quantitative data was analyzed to find relationships and corrections among the participants. Data revealed that participants were largely Caucasian, female and possessed a wide variety of perceptions about diversity education, their perception of what diversity was within the university community, and their opinions on whether or not acknowledging diversity was important in higher education in a college of agriculture. Results from this study offer a formative and summative look at the landscape of student perception of diversity and will help construct effective inclusive programming to foster a diverse learning environment for positive cross-cultural interaction.

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STEP UP to USDA Career Success Program Participation Increased Graduation Rates and Final GPA of Undergraduate Agriculture Students from South Texas

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Texas A&M University-Kingsville developed a program to engage students in scientific research or career experience and better qualify for USDA employment. This program bridged Associate and Baccalaureate degree granting, Hispanic Serving Institutions. We have previously shown that the 'STEP UP to USDA Career Success' program has successfully trained underrepresented students to increase workforce diversity. A secondary goal of the STEP UP Program was to increase scholastic measures in underrepresented agriculture students. Undergraduate students (n =87) received training at USDA Agencies, scientific research experience, or other career training within agriculture and were eligible for graduation during 2012 to 2015. The majority (95.4%, 83/87) of students graduated with a B.S. degree in agriculture. Participating students had greater 4-yr (87.5%, 7/8) and lower 6-yr (12.5%, 1/8) graduation rates as compared to non-participating students within the TAMUK College of Agriculture (18.8% and 35.4%, respectively). Transfer students that participated in STEP UP had greater (P<0.001) 2-yr (100%, 15/15) and 4-yr (91.7%, 55/60) graduation rates as compared to non-participating, transfer students (20.8%, 19/91 and 56.8%, 71/125; respectively) within the TAMUK College of Agriculture. Overall, the undergraduate GPA of STEP UP students before participation in the program was 3.002 ±0.047 and increased (P<0.001) to 3.174 ± 0.044 at graduation. We attribute the academic success of STEP UP students to an enhanced maturity level after participation and personal relationships established with USDA agencies, faculty, staff, and other STEP UP students. Experiential learning and student engagement benefit underrepresented agriculture students from south Texas.

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Utilizing the Group Member Role Questionnaire to Assign Students to Teams

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More frequently, instructors in colleges of agriculture are implementing team-based projects into their curriculum. The trend toward utilization of teams in the classroom can be attributed to stimuli provided by prospective employers, university initiatives, cooperative learning educators and accrediting agencies. One of the first hurdles instructors face when designing team-based projects is deciding how to divide students into teams. Studies have indicated instructor-chosen teams are more effective, but determining the method of team assignment is complex. One model which has been found to be effective in understanding the complexities of teams is Group Member Roles. This model states people who work in teams have the natural tendency to fulfill task, maintenance, or individual roles on teams. Task roles describe the team members who are comfortable in defining and solving the team objectives. Maintenance roles focus on interpersonal processes of teamwork. Individual roles describe the satisfaction of individual (not team) team members' needs. The objectives of this presentation are to introduce the Group Member Roles model and share how this model can and has been used to assign students to teams. The Group Member Roles Questionnaire (GMRQ) was modified and tested for face validity and reliability by the researchers. This new questionnaire was given to students at two different universities in courses which employ a team-based service-learning assignment. Team member assignments were made based on the (GMRQ) results and teams who were heterogeneously sorted as well as those who were homogeneously sorted by maintenance roles were found to be more effective.

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Southwest Agriculture and Food Security Education (SAFE): Filling the Gaps of Underrepresentation

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The USDA-NIFA funded project Southwest Agriculture and Food Security Education (SAFE): Preparing Future Leaders for a Safe and Secure U.S Food Supply System has addressed the need to train our future workforce for jobs with the United States Department of Agriculture (USDA) particularly in the area of food safety. There is documented evidence that there is a lack of minority representation in the USDA food safety and inspection areas. Texas State University has partnered with Austin Community College, Southwest Texas Junior College, and New Mexico State University to implement innovative teaching and research approaches to recruit, retain, and graduate Hispanic students to fill those gaps. Twenty-one scholar Hispanic students participated in a Department of Homeland Security training, FEMA Emergency Management training, student research through Academic Research Clusters, and USDA internships. Results from year 1 and 2 indicated overall GPA has increased (M = 3.20) to (M = 3.31), retention rate exceeded 93%, students have presented research at national conferences, the MANRRS student organization has grown, students have received two certifications (Department of Homeland Security and FEMA), and all community college students have transferred to Texas State University. Results from the first two years are promising and helping to develop a model to recruit and graduate Hispanic students in the agriculture and life sciences discipline.

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An Examination of Sustainability Behavioral Patterns of Students at Texas State University

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As the world population has continuously grown so has the burden on ecosystems and natural resources. With the global population growing, everyone plays a role on the impact we leave for future generations and the weight on the Earth's carrying capacity is becoming more evident. The purpose of this study was to examine the recycling and sustainability behavioral patterns held by students at a large public institution. Researchers sought to answer two research questions in the study: (1) To what extent do students at Texas State University practice recycling and sustainability? and (2) What are the knowledge levels of students at Texas State University regarding sustainable topics? An electronic survey was developed, pilot tested for reliability, and distributed to a sample (n = 500) of the total students (N = 36,739). Results indicated that students recycled most of the time (M = 3.54; SD = 1.07) although the majority indicated that they rarely compost (M = 1.95; SD = 1.22) or recycle e-waste (M = 2.50; SD = 1.24). The majority of the students had some knowledge on all of the sustainable subjects, but many indicated they were less knowledgeable in areas such as renewable energy and water quality. As a result, universities can implement innovative programs to educate and allow students to practice more sustainable behaviors.

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Empowering Students as Industry Ambassadors

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Students enrolled in Animal Science baccalaureate programs, much like the general population, have less agricultural background than in the past. However, society has an increasing interest in learning how their food is produced. The Ambassadors for Beef assignment was designed to help students learn concepts of beef management and then through service learning connect to, build rapport with, and relay accurate, scientifically founded information to consumers of all ages. Each year, North Carolina State University's College of Agriculture and Life Sciences and Department of Animal Science host a three-day event to provide an opportunity for the public, especially children, to learn about and interact with farm animals. Students in the senior level,

Beef Management class developed educational posters, led interactive seminars, and engaged in conversations about the beef industry. Posters and seminars focused around topics covered in the Beef Management course, such as handling facilities, beef breeds, equipment, and stages of production. Students who developed posters demonstrated their knowledge and confidence of beef management topics gained in the course by serving as ambassadors of the Beef Educational Unit and the beef industry through one-on-one interactions with guests. Seminars included 20 minute interactive sessions followed by at least 10 minutes of audience questions. Following the event, students reflected on their experience. It is hoped that this project can be expanded within the Beef Management course and be incorporated into other management courses as well to foster application of knowledge, strengthen communication skills and promote agricultural advocacy.

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Collaborative Course Development: An Empirical and Interdisciplinary Investigation

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This study is the foundational empirical investigation of collaborative course development (CCD) and utilizes an interdisciplinary experiment conducted over one academic year. While ten control-group classes employed traditional, instructor-led course designs of 'command-and-assess,' ten experimental groups carefully employed six collaborative, student-centered techniques. A between-subjects, after-only experiment was conducted over one academic year (i.e., two 15-week semesters) at California State University, Chico, a medium-sized public university. The five-person research team individually taught undergraduate agricultural experimentation, entrepreneurship, communication sciences, management, marketing, and mathematics classes in both the "traditional" (i.e., instructor-led) and the experimental (i.e., CCD) formats. Post hoc, t-tests revealed that CCD methods were effective at positively influencing felt engagement in all business classes (i.e., social science; $p < .01$) in comparison to non-business classes (in this case, the

"natural or hard sciences" of mathematics and communication sciences). Within business classes, the CCD mean was 5.75 compared to 5.16 for traditional classes ($t = 5.1$; $p < 0.01$). Within non-business classes, the CCD mean was lower, 4.67, than the "Traditional" mean, 5.61 ($t = -4.33$; $p < 0.01$). CCD methods significantly positively influenced business classes and significantly negatively influenced non-business classes. In summary, hypotheses alleged that the new emphasis on collaboration, empowerment, and choice would universally, positively influence the four dependent variables (i.e., perceived learning, felt engagement, course satisfaction, and ratings of professors). Interestingly, findings revealed an interdisciplinary-contextual effect not foreseen, nor previously investigated in other works. Specifically, CCD techniques were significantly more effective in business classes.

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Agripharmatech Program Certificates - Pathways for Transfer to Four Year Higher Education Institution and Beyond

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The Certificate of Achievement in Agripharmatech at Windward Community College provides multiple pathways for students to transition into the agriculture industry. The program promotes facilitating transfers to higher degree institutions, developing skills required for technologically advanced positions in the workforce, and promoting agribusiness/bioproduct entrepreneurship. The Certificate of Achievement in Agripharmatech was created with a CIP of 41.0101, and granted permanent status on August 21, 2014. A total of 42 CA Agripharmatech diplomas were awarded to 37 CA Agripharmatech graduates since the program's inception in Fall 2013. Twenty-two CA diplomas were awarded in May 2015, an increase of 100% from the previous year, well over the target stated in the UHCC Strategic Plan. Seventy percent of CA graduates transferred to 4-year degree institutions majoring in Tropical Plant and Soil Sciences, Molecular Biosciences and Bioengineering, Botany, Natural Resources and Environmental Management, Pharmacy, and Medicine. Seventy-four percent

of graduates entered the workforce in plant science related fields. Seven percent of graduates became agribusiness and/or nutraceutical plant-based product entrepreneurs. The author/presenter was one of the CA Agripharmatech graduates in 2013, who transferred to the University of Hawaii, Mānoa and received a Bachelor's degree in Natural Resources and Environmental Management in 2014, and a Master's degree in Human Nutrition, Food and Animal Science in 2016. She also has become an agribusiness entrepreneur (Hawaii AquaSeed Company). She accomplished two out of three objectives of Agripharmatech program. Her academic pathway and career achievement will be presented.

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Educational Value of Human-Animal Interactions

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It is often anecdotally noted that the presence of an animal creates a desire in humans to learn more about the animal; however, the influence of human-animal interactions on student learning has yet to be scientifically evaluated. The objective of this study was to measure the effect of the presence of a live animal in an educational setting. It is hypothesized that the presence of a live animal during an educational presentation, as well as the novelty of the animal will increase a student's knowledge about that animal. Nineteen students majoring in Animal Sciences participated in a pilot study to test these hypotheses. A pre-/post-test methodology was used to measure knowledge gained from the presentation, as well as a second posttest administered a week later to measure knowledge retention. Participants were randomly assigned to either the control group watching a pre-recorded educational presentation or the treatment group watching the same pre-recorded presentation but also having the animal being discussed in the presentation live in the classroom. Results suggest that the presence of a live animal in a learning situation yields higher average second posttest scores (i.e., knowledge retention). Animal category also had an effect with exotic animals yielding a 4% increase in overall knowledge retained, compared to a 3% increase with companion animals and a 1% decrease with agricultural animals. Results

support the hypothesis that human-animal interactions in an educational setting improve student learning and should be further tested with a more diversified student population.

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Is Class Size in an Introduction to Sustainability Course related to Student Self-Efficacy?

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Continued pressures for assessment of learning outcomes in undergraduate programs are cause for identifying factors impacting student performance. Class size is one factor that may influence students' academic growth and ultimately their proficiency of course outcomes. One component that is associated with student academic growth is self-efficacy. Self-efficacy is one's belief that one can perform difficult tasks or cope with adversity. Studies have shown positive relationships between students' self-efficacy and academic achievement as well as motivation. The purpose of this study was to determine if class size effected students' self-efficacy as measured by the General Self-Efficacy (GSE) scale. The study utilized a nonequivalent control group quasi-experimental design with class size as the independent variable (three sections of Introduction to Sustainability; n=39, 49, and 60 students) and the GSE scale as the dependent variable. Post-test GSE data indicated that all class sections had positive changes in scores with mean scores ranging from 30.8 (SD=4.6) for the 60-student section to 32.0 (SD=4.2) for the section with 49 students. An ANCOVA between the three sections (class size of 39, 49 and 60) revealed a non-significant main effect for class size $F(2,144) = 0.934$, $p = 0.395$. The estimated marginal mean for section sizes were: n=39 (31.0), n=49 (31.9), and n=60 (30.8) students respectively. The results of this study indicated that class size of 60 or less did not negatively affect students' self-efficacy. It is possible that larger sections (100 plus) might influence self-efficacy and merits further study.

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Developing Team-Oriented Tactical Skills in Crisis Planning and Management within an Established Agvocacy Course

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Equipping graduates with team-oriented tactical skills is critical to corporate and privatized agriculture. Issues often present themselves in crisis form. They can be devastating to the agricultural enterprise, corporation, or business if they are not effectively handled. Because of growing complexities of most issues facing organizations, teams of people with diverse mindsets are needed for the strategic preparedness and resolution of crisis moments. Armed with awareness, strategic/tactical plan and trained personnel, the negative impacts of a crisis can be minimized. An Animal Sciences course established to equip students with the ability to be effective spokespersons and leaders for agriculture within the campus, communities, and society included a module on crisis planning and management tactics to enable learning outcomes of improved knowledge and abilities to plan and execute steps in a crisis. Students were oriented to discrete steps in issue and crisis tactics (including strategic planning, preplanned messaging, and proactive strategies and responses) using a class module that created an alignment team. This was followed by role-playing exercises within case studies where students are assigned characters representing internal and external roles or audiences related to the business. Characters ranged from management, employees, public community members to government regulators. Students were allowed to develop their character roles in a pre-crisis period and then spontaneously simulate their planning or execution of plans during simulation of an emerging crisis. Processes were catalyzed and guided by the instructor. A 30-question pre- and post-exercise, Likert scale assessment support achievement of learning outcomes whereby students are more knowledgeable and capable of participating as a team member in executing tactics of crisis planning and management.

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Relationships between Psychological Type and Leadership Perceptions in Undergraduate Leadership Students

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Understanding students' perceptions of their own leadership potential is an important first step in promoting their growth in leadership courses. Furthermore, discovering if traits such as psychological type influence leadership students' perceptions of their abilities can help faculty of these courses better serve their students. The purpose of this study was to determine if relationships exist between leadership students' psychological type and their perceptions of competence in and importance of various leadership constructs. Data for this study were collected from two cohorts of students (N = 39) enrolled in a year-long, sophomore-level leadership academy. Psychological type was measured through the four dichotomies used in the Myers-Briggs Typology Indicator. Perceptions of leadership were measured using a researcher-created instrument, which included thirteen leadership constructs. For each item, participants used 6-point Likert-type scales to rate their perceived competence in and the importance they placed on the described skill. Point biserial correlations were calculated to determine results. Psychological type played a more prominent role in students' perceptions of the importance of leadership skills, with six constructs significantly correlated with components of their psychological type. Two additional constructs were influenced by their type when examining their perceived competence in leadership. The thinking-feeling dichotomy played the largest role, having a significant relationship with five of the eight constructs. Therefore, based on the relatively low number of significant relationships discovered, this study underscores the complexity of psychological type and the role it plays in leadership development.

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Agricultural Networking Night: An Alternate Career Development Activity

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Undergoing major transformations and modernizing over the past decades, the agriculture industry has broadened and increased its professional workforce. While production still plays a major role in the agriculture industry, other areas such as marketing, advertising, and management have evolved. Despite this evolution and growth in the agriculture industry, there has been a decline in agricultural representation at job fairs hosted by Career Services at Texas A&M University-Commerce. Faculty members contribute this to numerous factors such as a weak economy, growth in Internet-based job placement sites, and increased urbanization in the region. It was identified that an alternative type of career development activity that catered to agricultural employers and agriculture related majors was needed. With this in mind, Ag Networking Night was established. The purpose of this study was to explore the success rate over the course of time, in creating an alternative career development activity (Ag Networking Night), specifically for agriculture related majors and industries. Attendance sheets and survey instruments were utilized to collect data from both students and industry representatives. Findings indicated a gradual increase in attendance over the last five years in both industry representatives and agricultural related majors.

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A Comprehensive and Interdisciplinary Approach to Teach International Agriculture

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One of the approaches being used by universities to familiarize students to the real global challenges is study abroad programs. In the last three years, 25 students from diverse majors participated in a three-week study abroad mission to Ghana as part of our goal for training them in international agricultural issues. The main features of the mission were interdisciplinary, team guiding and teaching approach by faculty from diverse fields, to facilitate interaction among the varied backgrounds and majors of participants. The management of the mission involved strategies that enabled participation of each specialization in the discussion from their perspective. Students earned up to three credits in International Agriculture or International Development at DSU or UMES, respectively. Their activities consisted of a rich combination of field trips, group discussion and exercises, interviews and interaction with policy makers, researchers and farmers. The pre-trip and post-trip surveys of the students indicated that the strategy helped them understand key characteristic features of agricultural development in Ghana. Student experiences encompassed agricultural policy development, implementation, and its influence on market creation for businesses and market access for farmers. Before the trip, students perceived that their knowledge of the target criteria was average but had high interest in the program. Post trip data analysis showed a significant increase in knowledge and skills criteria while maintaining a high level of interest in the program. This model for study abroad orientation is an effective way to present broad-based agricultural development issues, and complex socio-economic issues to undergraduate students.

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Factors Influencing a Freshmen's Decision to Major in Agriculture

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To increase effectiveness and identify areas of recruitment improvement, the freshman class enrolled in AGR 10100: Introduction to the College of Agriculture and Purdue University course was surveyed. Results describe the Purdue College of Agriculture 2015 freshman population and identify the primary factors influencing their choice of major at that time. These factors included pre-college organization involvement, university opportunities, career characteristics, and individuals.

Students were required to complete the survey for a course grade, however students indicated as a part of the survey whether their results could be utilized in a research study. In the fall 2015 class, 537 students indicated their answers could be used in our research study (98.90% response rate). Demographically, nearly 60% (n=317) of the responses were female and all academic departments were represented. Thirty-two percent (n=172) were involved in both 4-H and FFA, 20% (n=107) were involved in only 4-H and 9% (n=46) were only involved in FFA, and 39% (n=212) were not involved in either 4-H or FFA. University and program traits like program fit, reputations and rankings, and experiences outside of the class ranked as high influencing factors. Students agreed that campus visits and College of Agriculture tours were influential parts of their decision to attend Purdue with this initial major choice. When asked to rank individuals who influenced their choice of major, students responded that parents and guardians were most influential, followed by family, friends, Purdue student(s) or alumni, and high school science teacher as the top 5 individual groups.

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Integrating High-Impact Learning Experiences: Teaching Agricultural Leadership to Inmates at a Local Federal Prison

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Some institutions are experiencing an increased demand of the benefits they provide to the local community. Agricultural leadership education is available for those outside of college campuses and for incarcerated individuals. Students participate in a leading and training adults course in the college of agriculture designed to teach students how to teach adults. The final project serves as an opportunity for the students to teach women that were incarcerated at a local federal prison. Undergraduate students have developed a lesson plan, delivered the lesson, and evaluated the lesson at a minimum security federal prison over the past five years. The topic students chose was approved by the instructor but covered areas within agricultural leadership education. Over 200 students have taught approximately 2,500 inmates as a result of this collaborative effort in the past five years. Participants (inmates) submit an evaluation of each presenter at the conclusion of the agricultural leadership training sessions. Students submit a pre and post evaluation of their experience to the instructor, and the evaluation data is used to enhance the topics each year. Students' perceptions of prisons and inmates change throughout the process of developing and delivering their lesson plan. These high-impact learning experiences have influenced their perspective of teaching agricultural leadership topics to individuals not directly involved in agriculture. A sustained symbiotic collaboration between the university and the local women's prison has resulted from these experiences. Students gain by putting knowledge into practice while developing an awareness regarding a societal aspect that affects us all.

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Experiential Learning through Field Practice in an Undergraduate Crop Science Classroom

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Active learning is a key component to a student's educational experience. Agronomic topics are difficult for students to grasp if they have had no prior experience or when introducing different applied practices of crops and crop production. Problem based learning increases student achievement and the ability to synthesize information. The objective of this innovative teaching technique was to provide students with active, experiential opportunities to study and learn about agronomic practices in a laboratory setting involving a rotation of corn (*Zea mays*), soybeans (*Glycine max*), and wheat (*Triticum aestivum*). Three laboratory experiences were conducted over the course of the semester in an introductory crop and soils class to engage students in active learning at an outdoor field site. The laboratory experiences included activities that allowed students to: 1) estimate varying corn planting populations; 2) determine plant populations of different soybean seed spacing; and 3) analyze wheat planting dates and populations. Planting decisions were based on current production practices typical of south central Michigan. Student engagement included analysis of planting practices, calculating yield estimates, and observation of plant growth in the field over time. Students interpreted

yield estimates using laboratory reports, taking into account agronomic practices applied, potential complications, and possible errors in data collection. This innovative teaching application provides an opportunity to better understand student learning through formative laboratory activities. Future research will include student course comments as well as pre- and post-laboratory survey to determine level of student understanding in an active learning, problem based laboratory setting.

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Cattleman's Boot Camp: Cultivating Success of 4-H and FFA Youth

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Clemson Cooperative Extension is committed to disseminating unbiased research knowledge established in the Smith Lever Act of 1914. Today, Clemson Extension continues this practice by providing adults and youth with opportunities to gain hands-on application of knowledge through programs such as the Cattleman's Boot Camp. Specifically, hands-on experiences like this should provide youth with cross-subject, contextual learning in order to prepare students to enter a competitive work force. The purpose of the study was two-fold. First, the researchers sought to determine learning outcomes of youth participating in the Cattleman's Boot Camp program. In addition to learning outcomes, the researchers sought to determine how Clemson Extension could better serve the needs of youth interested in the livestock industry. The first part of the study utilized pre-test and post-test instruments associated with core concepts of the livestock industry. Interviews with parents, agriculture teachers, 4-H agents, and youth helped the researchers determine gaps in skills in leadership, communication and problem solving in addition to the learning needs of youth interested in livestock. Results indicate youth need more hands-on opportunities with many topics in the livestock industry, but that youth were motivated to become more involved or stay involved in the livestock industry after boot camp experiences. Results also highlighted gaps between hands-on learning versus common classroom resources. By understanding these gaps, we can provide agriculture teachers, 4-H agents, parents, and students with curriculum, resources, and other opportunities geared toward FFA and 4-H youth interested in a career in livestock.

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Predicting Perceived Major Fit among College Freshmen and Transfer Students

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Student's perceptions of their abilities to perform well as a college student demands a fit with their academic major. A student must also feel that they possess the necessary skills needed to be successful in their chosen major in order to be career ready. The purpose of this study was to explore and test the satisfaction model of social cognitive career theory (SCCT). In particular, we explored the role of affective states and expected career outcomes on freshmen college student's perceived major fit. In the fall of 2015, surveys were administered to students (N=529) in an introductory agricultural seminar course in the College of Agriculture at Purdue University. Incoming freshmen and transfer students responded to survey questions related to factors, activities, and individuals influencing them to choose their currently identified major. Findings revealed that perceived major fit was significantly predicted by affective commitment to the major, expected career performance, expected career satisfaction and career decision self-efficacy. This study extends our current understanding of academic major influencers among college of agriculture freshmen and transfer majors and how students' perceived fit within a major is a function of other salient educational and career outcome variables.

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Distribution Methods of Result Demonstration Results by County Extension Agents in Texas

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Through boll weevil demonstrations near Terrell, Texas in the Cooperative Extension System has seen the value of demonstrations in educating those directly involved in agriculture and the general public. Result Demonstrations are an effective educational tool having a large impact on adoption rates by agricultural producers and the general public. This study evaluated County Extension Agents (CEAs) in 250 Texas counties, with 135 (54.0%) CEAs returning the web-based instrument regarding the training received in relation to demonstrations, planning methods for developing result demonstrations, and how demonstration results are distributed. This study revealed 75.9% (f = 102) of the respondents distribute some type of summary report and, the majority of the agents (58.9%, f = 79) utilize newsletters to disseminate information. Further, 31.9% (f = 43) reported using web-sites as a major means of information distribution. Only 9.2% (f = 12) of the agents are completing Result Demonstration Handbook and providing them to clientele. In addition, 38.3% of the CEA's are utilizing other methods to distribute results which include social media, one-on-one discussions, newspaper articles, and handouts provided in the office or at a field day. The results found that CEAs are utilizing a variety of means to distribute the result demonstration findings. Information within this study has contributed to educating students preparing for a career in Extension on utilizing result demonstrations as a successful educational tool and proper distribution methods of those findings.

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Impact of Food Science Professionals on Student Learning in an Academic Setting

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New food science professionals must not only have adequate academic training, but they must also possess success skills such as critical thinking, problem-solving, and oral and written communication to meet employer expectations and effectively complete assigned tasks. Students acquire success skills and learn how to apply knowledge when they participate in experiential learning exercises. To make students more aware of employer expectations and provide them with the opportunity to develop such success skills, food science professionals from ACH Food Companies, Inc. (ACH) collaborated with the instructor of a food product development course to implement a semester-long ACH product development case study. Students interacted with food science professionals throughout the semester while they worked on the case study. ACH provided students with three campus visits to provide feedback and assess student progress. ACH also provided students with two consulting hours per week. Students (n = 12) perceived the involvement of food science professionals in the course and the ACH product development case study to be beneficial. Students became more aware about the different stages of the product development process. Students also gained insight about the roles and responsibilities of ACH employees and ACH's approach toward product development. Improvements in students' critical thinking, problem-solving, and oral and written communication skills were observed. This approach, to incorporate experiential learning through food industry collaboration, will continue to be used and further investigated to determine the effectiveness of instructional design and contribution to student learning and preparation for the workforce.

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Assessment of Student Scores in Agricultural Mechanics Career Development Events: An Investigation into Students Knowledge Base

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Students entering college agricultural mechanics courses are consistently reporting having less knowledge in agricultural mechanics. Yet, the agricultural mechanics courses offered at both the high school and collegiate level are some of the most popular and fastest growing across the country. This study examines high school Agricultural Mechanics students to assess their knowledge base regarding specific power and technical systems. Scores in two different Career Development Events, across an eight-year period were analyzed to explore what areas students were the most proficient in. Questions on written exams for the two Texas based CDE's where placed in to one of 11 constructs. Further the items were divided in to 3 sub-constructs; maintenance, repair and theory. The results of this study indicate no significant difference among students across the eight-year period (p=<0.05). This study indicates student have the most knowledge regarding safety, diagnostics, and fuel systems, and the lowest knowledge levels regarding schematics, electrical, and air filtration systems. These knowledge gaps could represent deficient areas in teacher preparation, lack of teaching materials, or lack of knowledge transfer. Teacher preparation programs should actively include courses aimed at developing agricultural mechanics content knowledge. Investigation into student and teacher knowledge should be conducted as well as specific areas of teacher preparation and teaching materials available regarding agricultural mechanics.

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The LEADERS Program: Encouraging Hispanic Students to Pursue Advanced Degrees in Animal Science

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The LEADERS Program: Learning, Enhancing, and Developing Experiential Research Skills is a collaborative project that began in 2013 between Texas A&M University-Kingsville and New Mexico State University animal science programs. A major goal of the project is to increase the number of Hispanic leaders in the field of animal science through obtainment of an advanced degree (M.S., Ph.D., or D.V.M.). A strategy to achieve this goal is to engage students in research projects that will enhance their ability to use scientific knowledge while increasing their technical skill set. To date, 23 students (15 B.S. and 8 M.S.) have been involved with the program and were surveyed about their experiences. Respondent demographics show that 100% of the students are Hispanic and 69% are first generation college students. A majority of the project participants (83%) were engaged in research and many of those (80%) had presented that research. Of the 12 students who have graduated with a B.S. (n=9) or M.S. (n=3), 58% of those students continued their education by pursuing an advanced degree. Another 17% began their career, but will return to graduate school next semester. In support of these findings, 91% of the students surveyed believed their degree and the opportunities provided to them through this program will prepare them for post-graduate work and future career success. Results from this program indicate that experiential learning through research and student-faculty mentoring can increase the number of underrepresented students obtaining advanced degrees which will improve Hispanic leadership in the animal science industry.

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Innovative Use of GoogleDocs™ to Engage High School and University Students in Experiential Learning using a Simulation Game

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A departmental recruiting event at a non-land-grant university gathers high school agriscience students from across the area for a day of experiential learning. The agribusiness program area contributes to the event by facilitating a futures trading simulation experience. For the trading game, high school students work in pairs buying and selling futures contracts using an open-outcry, pit-based system. The simulation has been performed over the past three years, with incremental improvements made each time. Effective delivery by the provider and participation by students require real-time data on open positions, current cash position, and key pricing information. Spreadsheets are continuously projected so that players can readily see information for decision-making. Timely information availability to the participants is critical. Prior to incorporating Google-Docs, use of multiple, non-interactive spreadsheets delayed posting of information, reducing simulation effectiveness. Frequently, data failed to appear in time to aid students in making informed trades. Consequently, we reengineered the interface using GoogleDocs spreadsheets, which allowed several users to make changes to the same file simultaneously. This improvement facilitated data entry, quality control checks, and market updates in near real-time, with minimal lag due to network and internet latency. This has increased accuracy and timeliness, and stimulated student engagement. Additionally, development of the multiuser spreadsheet system allowed faculty to work with the university students enabling the event, teaching these future agribusiness professionals key knowledge and skills in effective collaboration. University students reported increased conceptual clarity regarding futures trading. This process can be replicated by other institutions for similar events.

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Factors Influencing Successful Secondary Agricultural Programs Outside the Classroom

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Agricultural education is a complex organization made up of numerous variables including: building competencies, applying knowledge and skills, developing problem solving abilities, and learning technical abilities. Previous studies have implied that excellent agricultural education programs are made up of engaged students, instructors who are motivated and knowledgeable in their fields, and the opportunities for real life/ industry based educational experiences. Further research has explored the effects of student participation in FFA and SAE programs. However, little research has been conducted on the traits and characteristics of successful SAE programs and FFA chapters. This study was designed in such a way to identify those traits and characteristics of secondary agricultural education programs which contribute to successful SAE programs and FFA chapters. Utilizing a modified Delphi method, instruments were sent to one hundred secondary agricultural instructors in 58 different schools in Arkansas whose programs were identified as successful in the previous five years based on specific criteria including at the state level: won a CDE or LDE, a division in the agriscience fair, state fair market shows, had state officers elected, or had been awarded a national chapter award. Research has concluded there are an abundance of factors that contributes to the success of both SAE and FFA programs. Future research should compare the traits and characteristics found from this study to those of all programs in Arkansas. Addition research should be conducted with similar secondary agricultural education programs nationwide.

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Factors that Influenced Students to Attend Tarleton State University and Enroll in the College of Agricultural and Environmental Sciences

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This study investigated the demographics, influence of participating in 4-H and FFA events, and factors influencing students' decisions to enroll at Tarleton State University (TSU). The research methodology for this study was a descriptive/correlational design. Descriptive statistics were used for demographics, 4-H/FFA participation, and influencing factors to enroll at TSU. Furthermore, numerous relationships were observed and thus, a multiple regression analysis was employed. There was a strong relationship for attending TSU ($p < 0.05$) indicated between FFA membership, FFA judging events, and attending FFA leadership events. Also, the reputation of the institution and of academic programs in agriculture, costs, specific degree programs, high school agriculture teacher recommendation, and tours should be considered important when observing influential factors for choosing TSU.

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Effects of the iVetSchool Application on Veterinary Medical Students' Food Animal Knowledge

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The safety of the nation's food supply is dependent upon well trained food security veterinarians. Training these individuals has become progressively more challenging as the background of veterinary students has changed, with fewer students coming from agricultural backgrounds with food safety knowledge. In addition, many veterinary colleges have seen a decline in the number of food animal cases which were previously used to provide this type of education. The purpose of this study was to determine if supplementing veterinary medical student's food animal preparation with the iVetSchool app increased their food animal veterinary knowledge. The iVetSchool app provides students with food animal case studies that allow them to work through the most common cases they will encounter. A quasi-experimental non-equivalent control group design was used to determine if the app affected students' food animal knowledge. The Michigan State and Mississippi State Classes of 2013 served as the control (no app) and the Classes of 2015 served as the treatment (students used the app). Both control and treatment groups were pre-tested at the beginning of their sophomore year and then post-tested at the conclusion of their sophomore year with a food animal knowledge test. An ANCOVA between the 2015 classes (used the app) and the 2013 classes (did not use the app) revealed a main effect of the treatment $F_{(1,320)} = 5.71$, $p = 0.017$. The estimated marginal mean for the treatment group was 17.0 and for the control group was 16.1. The use of the iVetSchool app improved the treatment group's food animal knowledge.

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Establishing the Pipeline to Recruiting Minorities in Agricultural Education: A Phenomenological Approach in an Urban School in Illinois

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Based on previous studies it was found that black and Hispanic students tend to have more negative attitudes toward the traditional components of agriculture. One researcher went on to state that as agricultural educators plan for the future with an increasingly diverse population, and prepare to serve a global economy, there is a great need to recruit and retain members of diverse populations in agricultural programs. In this study the researcher focused on his/her experiences in agricultural education (the phenomenon) and the essential experiences of students of color within an Urban High School in Illinois. The study sought to determine who/what influenced the students to enroll in agricultural education courses; to determine what personal or organizational factors most influenced their participation; and to determine what factors would contribute to their continual participation in agricultural education programs. The researcher conducted an open ended

focus group interview with 32 students in two (2) agricultural education classes. Common themes originated from the research objectives: curriculum; career possibilities; money; lack of role models; the involvement of the advisor; lack of agricultural literacy; and opportunity. Implications of the study found that with this being an "inner city urban" school most if not all of the minority students interviewed were unaware of all of the opportunities available to them through agriculture; increased emphasis should be placed on urban (low income) schools and a positive projection of agriculture needs to be implemented in urban schools.

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You Can't Handle the Truth! A Review of Literature of Attitudes of Spouses Toward Family Responsibilities of Agricultural Educators

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In order to be an effective teacher in the classroom, teachers gather mental, emotional and intellectual resources constantly. Agricultural teachers often find themselves working well past a 40-hour work week as they supervise student's projects, judge various self-improvement contest, coach career development teams, evaluate student work and prepare lessons. Agricultural education teachers are finding this conditions more and more prominent in their everyday lives leading to a condition described as "burnout". Attaining a reasonable balance between family and work affects an individual's choice of their occupation, employer and their involvement at the job. In this study the researchers sought to: (1) determine the knowledge of spouses toward the agricultural profession; (2) determine the barriers to job satisfaction; and (3) to determine factors for marital satisfaction within the agricultural profession. Results from the review of literature found that stress associated with agricultural education is no different from other long-hour professions; training sessions should be implemented to prepare agriculture teachers for these stressful conditions; and support from the spouse is highly encouraged within the agriculture profession. As a result, universities could implement professional development courses that would focus on family and stress management in teacher education.

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Exposing Undergraduate Students to the Extension Mission of Land Grant Universities Using a Course Field Trip

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Undergraduate students are regularly exposed to teaching and research activities associated with the land-grant mission, but often lack significant outreach exposure. Thus, undergraduates may not fully understand the role, value, and benefits of Extension programs. In order to increase awareness of Kansas State University's (KSU) Research and Extension programs, students in the Fall 2015 Landscape Plants Identification course, were provided an opportunity to visit the KSU Olathe Horticulture Research and Extension Center (OHREC). Students (n=15) voluntarily participated and spent the day interacting with and learning from K-State Research and Extension faculty and staff, and industry expert. Field trip activities focused on the Prairie Star Flowers program and other Extension Research activities at the OHREC. Students completed a post-trip retrospective survey to assess the impact of their experience and understanding of Extension. One question surveyed students on their familiarity with extension resources, prior to and after their visit; (0= Not at all familiar; 1 =Slightly familiar; 2= Somewhat familiar; 3=Moderately familiar; and 4= Very familiar). Prior to the visit, 20% were not at all familiar, with 33% and 40% slightly familiar and moderately familiar, respectively. After the field trip, student familiarity ratings increased; 88% indicated moderate to very familiar ratings about extension. Additional survey results indicated an increased relevancy of Extension. Based on this initial survey, adding extension activities to undergraduate curriculum can increase their awareness and understanding of Extension. And as future alumni and stakeholders, it is advantageous that they have an appreciation and understanding of Extension resources available.

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Evaluating Impact of an Electronic Communication Tool to Manage Insect Pests on Peppermint

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Research was conducted in multiple regions of Oregon to evaluate Coragen, a new environmentally friendly insecticide. It is applied at very low rates with low toxicity to beneficial insects and the environment to control larval pests on peppermint. Treatments were most effective when applied at peak moth flight to control eggs and first instar larvae, with application timing based on insect development models. For mint root borer in particular, this mid-growing season application timing differs from traditional fall application after larval feeding damage that began in July. The objective of this Oregon Mint Commission funded electronic Mint Pest Alert Newsletter was to assist growers and field scouts in thinking about insecticide application timing much earlier in the season and assure that they are aware of this new insecticide option. Following two years of the newsletter providing targeted information specifically for the three mint growing regions in Oregon, an electronic survey was conducted to evaluate impact. Twenty-six percent of newsletter recipients responded to the survey, 43% growers and 57% field scouts or industry representatives. Based on a scale from 1 (uninformed) to 5 (fully informed), knowledge of degree-day insect development models increased from 3.0 to 3.9. Knowledge of the new insecticide, Coragen, increased from 3.4 to 4.1. Although 72% of respondents continued to use traditional insecticides during 2015 based largely on cost, 63% indicated their future plans included the use of Coragen. When asked whether the newsletter should continue, 75% of respondents said yes, 25% indicated maybe and 0% replied no.

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High School Students' Views of Agriculture and Agricultural Careers upon Completion of a Pre-College Experience

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Pre-college agriculture experiences on a university campus introduce high school students to new career opportunities and fields of study. The purpose of this study was to explore and describe the outcomes of two separate pre-college experiences, the Molecular Agriculture Summer Institute (MASI) and the Purdue Agribusiness Science Academy (PASA), and participating high school students' motivation to engage in the experiences, agricultural career interests, views of agriculture, and educational aspirations. Because of the focus on non-traditional and underrepresented minority students, the Racial and Ethnic Minorities in STEM Model developed by Museus et al. was used to frame this study. Data collection consisted of three components: a student questionnaire (pre-test and post-test), semistructured interviews, and a structured follow-up phone-interview. MASI and PASA students reported they were motivated to engage in the pre-college experiences in relation to interest/enjoyment, value/usefulness, perceived competence, and effort/importance. Of the MASI students, 38% had a higher agricultural career interest after participating in the MASI pre-college experience, and 100% had a more positive view of agriculture after the MASI pre-college experience. Of the PASA students, 77% had a higher agricultural career interest after participating in the PASA pre-college experience, and 85% had a more positive view of agriculture after the PASA pre-college experience. While reflecting on MASI and PASA in follow-up phone interviews six to eight months after the pre-college experiences, students shared they were more aware of career opportunities available in agriculture and had a greater understanding of agriculture.

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Human-Animal Interactions in an Educational Setting Influence Student Heart Rate

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Animal agricultural programs often utilize live animals to enhance student learning. Although previous research has investigated the effect of human-animal interactions on physiological responses with mixed results, none of these studies have focused on the effect of human-animal interactions on physiological responses of students in an educational setting. Increased heart rate is associated with anxiety or stress, both of which may negatively impact student learning. In the present study, ten undergraduate students enrolled in an introductory animal science course were randomly selected from a larger study population to wear a heart rate monitor during educational presentations that included live animals. Three categories of animals (companion, livestock and exotic) were represented by three species within each category for a total of nine presentations. For each presentation, student heart rates were recorded when the animal entered the classroom, when the animal moved to a designated location 2 m from the students, and when the animal left the classroom. Data were analyzed using the GLM procedure of SAS. Students had the highest heart rate in the presence of exotic animals compared to companion animals or livestock ($P < 0.05$) suggesting that the novelty of the animal was positively associated with heart rate. There were no differences in student heart rate when livestock or companion animals were present at any time point during the presentation. These results indicate the type of animal used in educational settings may influence student response and highlight the need for additional research in this area.

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Combining Reflective and Reflexive Journaling as a Tool for Technical Skill Development

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Teaching and learning typically employs two different practices of journaling: reflective and reflexive. Reflective journals are introspective and used to self-evaluate actions and experiences. Reflexive journals are focus more on articulating knowledge development, rather than introspection. Undergraduate students in an introductory agricultural photojournalism course combined reflective and reflexive journaling as a course assignment. Implementing both reflective and reflexive journaling focused on introspection and technical skill development as an outcome of journaling. This practice was implemented in three different settings of the same course (agricultural photojournalism): a study abroad program, a study away program, and an on-campus course. During the experiences, students used a prompt to write daily journals based on photographs they captured. Students chose a photograph that best represented their work and analyzed the photograph based on their understanding of the curriculum they received. For each prompt, students were expected to reflectively and reflexively journal their experiences. Student learning was assessed through improvement in the journaling process and technical knowledge demonstration. Benefits of the combined journaling included identification of a new way to document learning processes; concrete experiences were reinforced by reflection; thoughts were transferred to action through reflexive journaling. As such, both internal and external processes were captured. Benefits of this innovative teaching practice include frequent debrief for instructors about instructional effectiveness, cognitive enhancement for students, and a linear method of capturing course feedback and skill development. Educators can implement this innovative teaching approach to enhance reflection and skill development. Implementation in other content areas should be considered.

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Evaluating the Impact of a Required Agricultural Mechanics Unit of Instruction on Pre-Service Teachers

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It is necessary that a pre-service teacher program provide pre-service teachers with experiences that will develop a high level of self-confidence.

Miller et al. (1989), found that the effectiveness of teachers is directly related to their confidence. Self-confidence is derived from the extent to which one believes one can produce results, perform tasks competently, and accomplish goals. This connection between self-esteem and self-confidence leads to a belief that if one is capable of performing a task, it will result in an increase in their personal self-esteem. This study focused on evaluating the pre-service teacher's self-confidence in teaching a unit of electrification which contained 14 skills. Pre-service teachers evaluated their confidence with a teaching self-confidence evaluation after taking an agricultural mechanizations course but just prior to the pre-service internship. The pre-service teachers returned during the cooperating schools spring break and completed a post teaching self-confidence evaluation, turn in lesson plans for the unit, and participate in a round-table discussion. The evaluation asked questions that pertained to the pre-service teacher's self-confidence that included electron theory of electricity, basic fundamentals of electricity, electrical tool identification, electricity calculations, drawing wiring diagrams, and basic wiring skills. The data was evaluated using a t test. Statistical differences were found in teaching electron theory and electrical calculations after analysis of the pre-internship and post-internship evaluations. It was found that the student teachers were lacking in the area of wiring diagrams by showing a large decrease in confidence from the pre-internship to the post-internship evaluation.

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Developing Students' Questioning Ability

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The development of informative and thought provoking questioning skills is rarely taught. Moreover, the ability to ask the right question or frame a question properly is often elusive for students, yet it can be instrumental in information retention. In our second year livestock production and management courses we arrange an extended field laboratory or "industry tour". Preceding the laboratory, students are taught the "SOFT" questioning technique. The SOFT technique encourages students to develop questioning skills at increasing levels of cognition. S - represents a simple question designed to elicit basic information, simple responses, or statistics. This eases students into the conversation and helps develop confidence. O – represents an original question formulated by the student designed to elicit an extended response, such as the philosophy of the organization or marketing strategy. F – refers to the development of a follow-up question and serves both to foster listening skills and develop cognitive function simultaneously. Finally, stage T- is designed to elicit the development of a thought-provoking question. This technique was employed on our most recent beef industry tour. Grouping and limiting student questioners and designating stops a priori allowed advanced thought and minimized the likelihood that those employing the SOFT system would monopolize questioning and stifle spontaneous inquisitiveness. The SOFT technique met with mixed to mostly positive results. Most students commented that it made them concentrate more on the conversation and greatly aided their retention of information.

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Effects of Animated Content on Students' Perceptions of Learning in a Web-Based Animal Disease Course

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The web-based Emerging and Exotic Disease of Animals course provides information on diseases that threaten food security. Case-based disease scenarios are one component of the course that presents information in text, tables, and images. The purpose of this project was to add animated content to case scenarios with the goal of increasing learning about the diseases presented in the animations. Animations on Classical Swine Fever and African Swine Fever were incorporated into a disease scenario and students were given an opportunity to respond to a survey upon completion of the scenario. Of 131 students at 6 different institutions, 112 students completed the survey. The survey included questions about perceived learning and learning behaviors using a 1-

5 scale (5=strongly agree) along with some open-ended questions. Highest rated outcomes for animations were increased understanding of the pathogenesis (M=4.38), enhanced overall knowledge (M=4.28), and increased understanding of the clinical outcomes (M=4.21) of the diseases. Lowest rated outcomes were increased interest in learning more (M=3.81), increased motivation to seek out more information (M=3.55), and an intent to search for more information (M=3.38) about the diseases. Over 90% of respondents agreed or strongly agreed that the scenario including animations was better at increasing understanding (M=4.14) and knowledge (M=4.12) about the diseases, compared to scenarios that did not contain animations. Nearly 50% of respondents considered the major benefit of the animations to be the visual perspective they provided to understanding the diseases.

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Teaching Climate Change: An Assessment of Available Educational Materials on Climate Change

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Education has been identified as a barrier to implementation of climate-change mitigation and adaptation strategies. Educational materials have been identified and created for K-12, but there has not been a comprehensive assessment of climate-change educational materials for adult audiences. In-depth interviews with climate-change educators revealed limited availability of materials. The purpose of this study was to quantify available educational materials for adult audiences related to climate change. A quantitative content analysis was used to address the research purpose. The population was universities, government agencies, agricultural organizations, and Extension. Data were analyzed using descriptive statistics to identify frequencies and percentages by each variable (type of material, content are, owner/creator of materials). Researchers identified 140 individual educational materials. Extension had the highest frequency of materials (n = 47, 33.8%) followed closely by universities (n = 41, 29.4%). No single source provided a complete set of curriculum for adult education on climate change. The majority of materials were

management and planning guides (n = 36, 25.7%) followed by reports (n = 32, 22.9%, research (n = 18, 12.9%), videos (n =16, 11.4%), and fact sheets (n =11, 7.9%). Other than workshop materials (n =11, 7.9%), the available educational materials were self-guided and did not require an educator to facilitate learning. This research indicates a need to develop a cohesive curriculum for adult audiences related to climate science and mitigation and adaptation techniques. Future research should investigate the quality of information provided, the instructional delivery techniques, and the overall quality of the material.

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Teaching Quantitatively Rigorous Courses to Biology Students: A 'Semi-Flipped Classroom' Approach

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Teaching mathematically and computationally rigorous courses to biology students is challenging because many students in biological disciplines have developed an aversion to math and computer programming over the course of their education. Building on a decade of experience of teaching population ecology and other modeling-focused courses, we have developed a "semi-flipped classroom" approach to teaching quantitatively rigorous courses to biology students. In our approach, we have developed a self-guided lab manual explaining key topics in an easy-to-read language while using real-life examples, focusing on species of interest to students. Modeling, statistical analyses and data visualization are implemented in R, a freely available and incredibly versatile computational environment that is directly applicable to a broad range of fields. Through this approach, students learn how to use and apply population models and theory to address relevant conservation issues while at the same time learning valuable computational skills. We will present our experiences with this "semi-flipped classroom" approach to teaching quantitatively rigorous courses to biology students, and discuss the pros and cons of this approach.

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Panic at the Potluck: Design and Implementation of a Web-based Game

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Food safety is essential to societal well-being; and although people hear about food safety from today's media, society still lacks critical understanding about the extensive global food chain from farm to fork. Careers in food science and food safety are nearly recession proof, yet few people grow up dreaming of these careers. This study explores the application of edutainment through the use of a web-based game as a teaching tool where players face the complex food system with risks for a variety of foods. The players experience first-hand the role of minimizing contamination risks at each stage of the food chain to protect public health. The deck-building game contains nine levels of foods potentially served at a potluck for which risks and errors must be minimized by selection of the correct card to serve safe food. Gaming features include random card rotation, bonus cards, and an "ask-a-scientist" option to extend learning and improve game outcomes. During the final stages of game development, a student focus group held at New Mexico State University (n=17) commented on functionality and willingness to play the game for 20-30 minutes. The completed game is undergoing field-testing to assess difficulty and discrimination indices by students of various backgrounds and majors at the University of Delaware and University of Maryland-Eastern Shore to assess knowledge and perceptions of food science and food safety. Measurement tools include online and written surveys. This one-of-a-kind game combines science and fun to build knowledge of food science, food safety, and career opportunities.

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Students' Perceptions Regarding the Use of Technology in an Introductory Food Science Class

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Student engagement is a critical component to student success. Learning outcomes include developing new knowledge, comprehension, application, analysis, synthesis, and evaluation. These outcomes are achieved when two-way interaction exists between the student and the instructor. Various web- and clicker-based technologies have been incorporated in higher education classrooms to improve student engagement and learning. This study evaluated students' perceptions regarding the use of technology in an introductory food science class. Ten questions were included in the survey instrument to evaluate students' perceptions about the use of these interactive tools regarding their engagement or lack thereof. The questionnaire was administered to students (n = 102) who were enrolled in *Fundamentals of Food Science* during the fall 2015 semester. Data were collected during the 12th week of the semester on a scale of 1 = not at all true to 5 = very true. In the study, 75% of students indicated that using technology is not a distraction in class, and 80% specified that it helped engage them in the lesson. Additionally, 15% indicated they frequently check email or news/text/social media feeds or sports during lecture, and 35% indicated they check email and listen to class at the same time. A majority (55%) of students reported they were less focused toward the end of the 50-minute lecture. However, 85% of students indicated the instructor can limit distraction and increase student focus if he is organized and passionate about the material. In summary, students perceive technology in class positively and beneficial to their learning.

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Student Expectations and Perceptions of Graduate and Undergraduate Teaching Assistants in Laboratory Classes

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At larger 4-year universities, teaching assistants are frequently assigned to teach class laboratory sections. Often graduate students receive this responsibility, but qualified undergraduate students may also. The purpose of this study was to determine what student expectations are of teaching assistants, and to evaluate student perceptions of undergraduates teaching laboratory class sections. A survey was given to 268 students enrolled in several undergraduate level agronomy courses at Kansas State University. The most important student expectation of teaching assistants was "easy to understand" which nearly 80% of students rated "extremely important". One item of least importance was "office hours", which 57% of students rated as "not very important" or "somewhat important". While 72% of students would prefer to have a professor as their laboratory instructor, 18% of students did not care whether they had a professor, graduate teaching assistant, or undergraduate teaching assistant. The main concern about undergraduates serving as teaching assistants was that they "probably do not have enough knowledge in the field they are teaching", which was rated as "usually concerning" or "very concerning" by 50% of students. However, 70% indicated that it was "usually beneficial" or "very beneficial" that undergraduate teaching assistants had "taken the course themselves more recently". Based on this study, students primarily expect that teaching assistants are easy to understand, well prepared for class, and know when their students do not understand. Undergraduate teaching assistants are generally less preferred than graduate assistants and professors, unless they are very knowledgeable in their field of study.

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Food Science Exploration Program for Outreach to High School Students

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The demand for food scientists is anticipated to increase with human population growth. To enhance agricultural career awareness to prospective students drawn predominantly from urban and suburban communities, the University of Delaware (UD) Food Science developed an outreach event for high school students to explore the food science discipline and its career opportunities. The *Food Science Exploration Program,* initiated as an expansion of a workshop for secondary science educators, is a one-day event held on the UD campus for students selected based on competitive application and teacher recommendation. Faculty-led laboratory sessions on product development, sensory science, molecular gastronomy, chemistry, packaging, sustainability, and microbiological food safety are featured. Current UD students and alumni share student life and career experiences with the participants. The program has been offered 12 times from 2005 to 2015 for approximately 130 high school students from 6 states. Participant satisfaction is consistently high based on evaluations addressing approximately ten points of interest, including program expectations, quality of sessions, and consequent interest in the discipline. Students consistently favored hands-on activities and the opportunity to meet program members; 92% of respondents indicated they would consider a major or minor in food science as a result of participation. Of the 2005 to 2014 participants, 19% matriculated into the UD food science program or closely-related agricultural majors; all have either successfully graduated or are still pursuing these majors. To-date, 50% of 2015 participants have been offered admission. The program is a model for effective, short-duration and low-cost recruitment for agricultural programs.

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Using Research Findings to Develop Teaching Case Studies: The Case of Value-Added Dairy Operations in North Carolina's Piedmont Region

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In recent years, there has been a growing interest in North Carolina locally grown food (LGF) products, markets, and systems. The local dairy sector, in particular, exhibits strong growth, where the driving force has been linked to North Carolina's emerging economy, growing population, and changing consumer lifestyles and preferences. However, there has been little insight on local dairy production feasibility although consumers are adopting more and more organic and local dairy products. As with other locally produced products, major obstacles lie with the supply and distribution of dairy products. In an effort to link timely issues with problem-based learning, agricultural programs across the U.S. are having to reevaluate curriculum development. In particular, teaching feasibility case studies may serve as a unique way of introducing changes in local food systems to the classroom. Therefore, the objective of this presentation is to utilize research findings from feasibility case studies conducted for local value-added dairy operations in North Carolina's Piedmont Region to enhance undergraduate agricultural and environmental systems curriculums. The findings from four single goat dairy operations located in the region are presented on the following topics: market, technical, financial, and organizational feasibility, which can be applied in agricultural business management, agricultural science, animal industries, and special topics (local food systems) courses. Methods of teaching include discussion or formal debate through contrasts and comparisons among the four operations. Through teaching the cases, students gain more insight into common approaches in economic and marketing decisions faced by local value-added goat dairy operations.

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Recruiting Online: A Student Perspective of Social Media Use for Recruitment

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Many colleges of agriculture are using social media to recruit students, however, little is known about the effectiveness of these techniques. The purpose of this study was to determine student perceptions of social media for recruitment purposes. This study used survey methodology to understand the student perspective of social media use for recruitment by a college of agriculture at a land-grant institution. A series of questions were asked on a seven-point Likert scale related to current social media use (1 = do not use and 7 = use multiple times a day) and preference for social media use prior to coming to the University with 1 being "do not contact" and 7 being "the best way". Two hundred and eighty-three students took the survey. Student preference for social media for recruitment purposes was highest for Facebook (M = 4.72, SD = 1.99), YouTube (M = 3.90, SD = 1.94), and Twitter (M = 3.88, SD = 2.06). The lowest were Vine (M = 2.60, SD = 1.64), Google+ (M = 3.05, SD = 1.76), Pinterest (M = 3.00, SD = 1.79), and blogs (M = 3.30, SD = 1.90). There were statistically significant differences between personal social media use and preference for use during recruitment for Facebook and blogs. Results indicate social media use for recruitment purposes can be effective when the appropriate platforms are selected. Additionally, just because students are using a social media does not mean they want the college to contact them on that social media.

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A Collective Experiential Learning Opportunity at Razi University in Iran: Introducing a New Model of Student Farm

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Student farms provide experiential learning experiences and critical thinking skills. Although student farms focus on team work, a collective experiential learning model is needed to strengthen

students' full scale team working abilities. The major motivation for this study was to propose a new model for student farms that provide a unique collective experiential learning opportunity. The Department of Agricultural Extension and Education at Razi University organized student farm into student Coop so that student members can benefit from diverse incentives provided by Ministry of Cooperative. Some of these incentives include: providing loans to Coop members with new entrepreneurial ideas, providing training sessions to teach legal issues, and recognizing members in annual entrepreneurship contests. Currently, student Coop is engaged in natural resource conservation project. Student members work collectively to save oak trees by engaging in civiculture. The student Coop approach is a success and more undergraduate students across different discipline in college of agriculture are showing interest to become a member of student Coop.

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The Influence of Pre-College Experiences on Students' Decision to Enroll at Tarleton State University

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Recruiting efforts and concerns have and will continue to be an issue in higher education. Understanding factors involved in recruitment is necessary for universities to understand why students attend a specific institution. This study investigated the demographics, influence of participating in university events, and factors influencing students' decision to enroll at Tarleton State University (TSU). First-time-in-college freshmen were offered an online survey through Qualtrics to obtain both demographic information and student perception regarding events hosted at TSU. Frequency data provided inferences between influence of attending TSU and the factors associated to student perception. Specific degree programs, reputation of TSU, student population size, and total cost of attendance were noted as having the greatest influence on students' decision to attend TSU among external factors. Furthermore, frequency data revealed that friends, parents, high school agricultural teachers, and visit(s) from university faculty members were

deemed influential among personal contacts. Interesting results identified that 25% of the non-agricultural majors indicated that FFA judging contests were influential in their decision to attend TSU. Lastly, on-campus tours, FFA judging contests, and athletic events were most influential when activities were considered. As student demographics vary, the impression of a variety of factors continues to play an integral role in attracting students. Thus, recruitment strategies need to be frequently explored to coincide with changes in student population.

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Public Speaking: Do Curriculum Opportunities Enrich Oral Communication of Undergraduates?

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Undergraduates need to be capable of communicating information across disciplines, backgrounds, applications, and audiences. Previous course research evaluating written communication found improvements with disseminating functional food information. The present study goals were: (1) to assess undergraduate oral communication skills through a functional food presentation; and (2) to assess communication opportunities between two parallel departments. The class is composed of students from two departments in the College of Agriculture and Life Sciences. Preparation and oral communication differences were observed between students from these departments (Department 1 (n=17 students): mean score=8.4/10; Department 2 (n=14 students): mean score=9.1/10). Curricula were assessed to understand communication level variability and identify communication opportunity improvements. Both departments require a general public speaking course; however, undergraduate communication opportunities vary among required departmental courses. The lower scoring department provides one opportunity for public speaking (10-minute group presentation). The higher scoring department has four opportunities for public speaking: ((1) individual poster presentation and 10-minute group presentation; (2) group sharing and speaking throughout the semester; (3) 30-minute individual presentation; (4) 10-minute individual presentation). While opportunities for oral presentations are low in required major

courses in both departments, it appears that more oral communication opportunities enhance student skills. Oral communication assignments should be emphasized in courses and departmental curricula. Instructors of agriculture and life sciences should offer and place an emphasis on oral commination skill development by increasing communication opportunities. Oral communication and presentation skills are pertinent soft skills required for success.

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Usefulness of an Online Writing Improvement Tool for Agricultural Communications Courses

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Many college-level instructors have found their students' writing skills to be lacking. Grammarly® is an online writing assistance software that helps students identify errors in their work and check for academic integrity infringements, prompting them to polish their assignments before submitting. Students cannot simply "accept all changes," but must be thoughtful in making better grammatical choices. To determine its usefulness, 23 students taking writing-intensive courses prepared their assignments over the course of a semester using Grammarly® and anonymously gave feedback on the tool when the course concluded. Students responded to questionnaire items on a scale from 1-7 (1=strongly disagree, 7=strongly agree) and described the advantages and disadvantages of using it. They generally agreed that it was easy to use (median=6.00). However, usefulness and satisfaction ratings were less positive (median=5.00). Over two-thirds somewhat agreed (43.5%), agreed (13%), or strongly agreed (13%) that "even after using Grammarly®, my instructor often finds grammatical errors." Students noted the program's difficulty with stylistic elements, but liked that it highlighted spelling and punctuation issues. They somewhat agreed that they learned from commonly occurring mistakes (median=5.00) yet somewhat disagreed (median=3.00) that it helped change the way they write. These inconsistencies may be due to differences in motivation or current level of writing ability. Although Grammarly® was useful to identify obvious writing errors, an instructor is still needed

to catch subtle issues related to readability, organization, and context (e.g., phrasing unique to agricultural communications). Further study is needed to evaluate its effectiveness among students with lower writing aptitude.

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Utilizing an Experiential Learning to Develop Curriculum Modules

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When agriculture instructors are developing new and innovative ways to teach course material, more often than not experiential learning methods are considered, but can be a difficult to effectively implement. Because experiential learning through student-centered, teacher-led instruction continues to evolve as a means to achieve student outcomes and improve retention, many agriculture educators continue to explore new methodologies and strategies to incorporate it. This oral or poster presentation would articulate curriculum modules used to teach students the value of learning through experience. Each module has three core components: learning objectives, student assessments, and an instructor planning guide. Learning objectives provide the students and instructor a platform for the delivery of content. This component also provides an overview and lecture. Next, the student assessments, are activities and projects that project that provide the student the opportunity to apply the knowledge learned. This assessment would allow students to gain experience in many fields of agriculture and enable them to use critical thinking skills simultaneously. This part of the component also encompasses many aspects of visual, auditory, and kinesthetic learning styles with a laboratory element. The assessment portion of the module will enable students to work with groups and develop leadership skills while improving their experimental learning abilities. Last, the instructor planning guide gives the instructor a comprehensive, step-by-step instructions for each module. This includes objectives for the module, objectives for the assessment, and instructor's directions. In summary, this learning approach would enable

students to retain information using a student-centered – teacher-led learning style.

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Long-term Impacts of a Faculty Development Program for the Internationalization of Curriculum in Higher Education

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Faculty development programs for internationalization of the curriculum in higher education are often evaluated for short and medium-term outcomes, but more long-term assessments are needed to determine impact. This study examines the impacts on faculty from colleges of agriculture after participating in a faculty learning community engaged in a one-year professional development program for internationalization, which included a two-week experience in a Latin-American country with immersion in both pedagogical and global topics. The objectives of this study were to identify (1) the long-term impacts of the program and (2) the factors (program, personal, and environmental) that contribute to or hinder internationalization efforts. Social cognitive theory (Bandura, 1978) provided the theoretical framework. The researchers conducted semi-structured interviews with participants (N=9) in two of these programs – Costa Rica and Belize. Publicly available, secondary data was also examined to compare with the self-reported impacts of participants. Data was analyzed through constant comparative analysis, unitizing, and categorizing. Findings showed that impacts varied greatly among participants and was highly dependent on their personal characteristics and their current environment, as predicted through social cognitive theory. Strengthened peer relationships was the most common and significant theme among participants, with sub-themes including cross-departmental collaborations, a support group on campus, and friendships/informal interactions. Other themes included the internationalization of courses, new/broader perspectives, new courses, and additional themes related to an increase in international activities.

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Utilizing Focused Atmosphere Seminars for Improvement of 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 and 23% in Illinois. This indicates production agriculture only, which is less than two percent of agriculture industry. A Women in Agriculture Career and Leadership Seminar was hosted by the Department of Agriculture for female Agribusiness and Agricultural Education majors. Pre and post-questionnaires were administered to participants (n=22/27) which self-identified using a Likert-type scale of 100% Agree to 100% Disagree in areas of: networking, negotiation, professionalism, self-knowledge, and career skills. Data indicated improvement from within the focused atmosphere of the Career and Leadership Seminar: 36% of students initially identified a response of 50% Agree and 50% Disagree to the statement, "I am confident in my ability to convey my skills and knowledge, in writing, to a potential employer," followed by a 40% post-questionnaire response of 100% Agree to the same statement. Additionally, 40% of students identified with 75% Agree on the pre-questionnaire statement "I believe I will have a successful career in the agricultural industry," while 95% identified with 100% Agree on the post-questionnaire, respectively. 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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An Evaluation of Just-In-Time Teaching in Equine Science

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The Just-In-Time Teaching (JiTT) model is a student-centered pedagogical approach that integrates active learning strategies with Web-based activities to enhance the classroom experience. This teaching strategy has been shown to create a highly interactive classroom that improves students' critical thinking abilities, self-efficacy, and interpersonal communication and team building skills. This mixed methods study assessed the impact of the JiTT throughout a 16-week equine science course titled, Breaking and Training. Students were assessed at the beginning and end of the semester regarding their overall efficacy and knowledge of equine handling procedures. The findings supported the JiTT model as a positive approach to enhancing students' learning experiences in equine science. Specifically, the data revealed that students increased their content knowledge by 33% as a result of the JiTT teaching method, where students were expected to view YouTube videos prior to attending class and conduct additional research on topics they were unclear about in preparation for the hands-on activities they were expected to perform. In all, 12 of the 14 students noted that viewing YouTube videos informed their classroom experience positively and was an effective way to prepare for the hands-on activities they experienced in the course. Generally, students liked the class because it "encouraged us to help each other." However, two students voiced displeasure for having to "teach [themselves]" about how to train horses properly. To accommodate less efficacious learners, it is recommended that the instructor offer additional technical expertise, both before students come to class and during each specific hands-on activity.

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Keeping International Program REAL: Real World Applications within Limitations

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The importance and relevance of international experience for students has long been established by researchers. Many employers actually seek out students who have international experiences due to their ability to handle themselves in culturally, ethically, and racially diverse environments. Even with the significance of international experiences identified, the question still arises: Why are so few students engaging in international experiences? After talking with multiple students it became apparent that price and time commitment were the two most prohibitive factors. With this in mind, the Department of Agricultural and Consumer Sciences at Tarleton State University partnered with the Czech University of Life Sciences to provide a two-week program that would cost less than $1,000 (excluding plane tickets to and from Europe) and last no more than two weeks. After considerable efforts, a two-week program was designed that emphasized connections between theory and practice while enhancing the global perspective of students. The schedule for the program was established through a collaborative effort between Tarleton State University and the Czech University of Life Sciences. The intense two-week schedule is laden with agriculture, culture, tradition and real-world learning. Students visit agriculture production, processing and marketing venues. They experience culture and tradition through the eyes of real citizens that live and work within the agriculture industry. The program's low cost and limited time commitment has provided a venue for over fifty students from Tarleton State University to gain an invaluable international experience.

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Cultivating Communication Style to Prepare Agricultural Communicators for Employment

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Cultivating students' communication styles can impact students' employability. Communication style assessments are tools to facilitate understanding of communication preferences for themselves and their peers. These assessments are especially useful in courses where group work is critical. It is not known, though, how students plan to apply their communication style assessments to their careers in agricultural communications. This qualitative study analyzed 25 undergraduate and graduate students' reflections, which were completed summer 2014 after students applied their communication style in a social media course for four weeks. Data were analyzed using a content analysis approach with an open coding technique. Results revealed students planned to apply their understanding of communication style and how they deliver and receive information to their careers. Students expressed that knowing their communication style will help them be successful in their careers because they understand themselves, and through that, understand others. Many planned to use their communication style awareness to improve listening, understanding, communicating, and interacting in professional settings. To prepare students for the workforce, educators should provide students with in-class assessments (e.g., communication style) to facilitate awareness of individual differences. But, to supplement the assessment, educators should be intentional about integrating reflection as well. Further research is needed to determine how students apply their communication style once employed.

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Madison Teaching and Learning Excellence: An Innovative Early-Career Faculty Development Program at University of Wisconsin-Madison

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Faced with the demands of tenure, the value placed on research, and little to no experience in teaching, finding time to develop effective teaching presents a quandary for most early-career faculty at research orientated universities and colleges. The Teaching and Learning Excellence (MTLE) at University of Wisconsin - Madison is an innovative one-year fellowship program for early-career faculty that leverages resources and knowledge from the many teaching and learning organizations across campus. MTLE strives to produce fast, efficient, and effective starters through a cohort mentoring model that builds cross-disciplinary communities of practice, and a learner-focused curriculum that connects fellows with resources and leverages a shared drive for deep learning grounded in inquiry and reflection. We will argue with assessment data that by investing in early-career faculty and building cross-disciplinary communities of practice, we can foster academic excellence, impact student learning, and promote a culture that values teaching.

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Using Snapchat to Cultivate Feedback and Facilitate Engagement Amongst Millennials

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To obtain maximum feedback and engagement from today's millennial college students, instructors must understand how to engage them in different learning situations. Snapchat has been noted as an effective way to engage millennials because the social media application presents information in a real-time, quick, and disposable manner. By emulating Snapchat, this study successfully cultivated feedback and facilitated en-

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gagement amongst college students who participated in four, two-part focus group discussions about fresh produce advertisements. During the Snapchat approach, students (N = 22) were shown a series of advertisements for 10 seconds each and were allowed an additional 30 seconds to record the first five terms that came to their minds. Incorporating the Snapchat approach into the focus groups aided students' smooth transition into an open-ended discussion. Students noted the terminology recorded served as a reference point during the discussion portion, allowing them to reflect on their initial response to the advertisements. The approach also prompted students to remain alert, focused, engaged, and interested throughout the entirety of the focus groups. In turn, students provided rich, in-depth responses to the discussion questions. Therefore, educators should consider implementing the Snapchat approach in lectures, test reviews, and group projects to cultivate sound feedback and facilitate strong engagement amongst their students. Because Snapchat is a relatively new social media application, future research is needed to investigate the approach's ability to engage millennials in a classroom setting. The approach should also be further investigated as a new method to facilitate student learning through feedback and engagement.

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Forensic Plant Pathology: Enhancing U.S. Crop Biosecurity Through Multidisciplinary Graduate Education, Experience and Research

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After a recent Federal assessment of U.S. capability in microbial forensics called for additional research and personnel in forensic science related to crops, forests, and rangelands, we created a new sub-discipline of forensic plant pathology. With National Needs Fellowship Awards in 2006, 2009 and 2012 we developed a unique, interdisciplinary graduate experience combining Plant Pathology and Forensic Sciences. Program objectives are: (1) offer an interdisciplinary graduate program to provide knowledge, training and ex-

perience in science, law enforcement, and security issues necessary for a career in agricultural biosecurity; (2) design, perform and disseminate high quality graduate student research within the emerging discipline of agricultural forensics; (3) produce outstanding graduates, educated in agricultural/plant pathogen forensics, to fill anticipated positions in government, academia and industry. Fellows take coursework in both disciplines as well as in ethics, career skills and professionalism. Each Fellow experiences actual forensic research both at OSU and in summer internships at the FBI Laboratory, various U.S. National Laboratories, the EU *E. coli* Reference Laboratory in Rome, Italy, or other venues. They also conduct outreach by planning, creating teaching materials and delivering a 4-H Microbial Forensics Summer Camp. With each award, new Fellows are mentored by those more advanced. Input from Federal advisors assures relevancy and applicability. Our 2006 and most 2009 NNF Fellows are already in the National biosecurity workforce; others have entered Ph.D. programs or postdoc positions. National impact: This is the only US graduate program providing trained professionals and research targeted toward priority issues in plant pathogen forensics.

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Teaching Science, Technology, Engineering and Mathematics Through Agriculture, Food and Natural Resources

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One out of four jobs in agriculture, food and natural resources (AFNR) are in science, technology, engineering and mathematics (STEM), yet the integration of AFNR and STEM education are typically conducted independently within their respective domains (e.g., agriculture education or science education). Teachers play an important role in helping students learn, and literature supports a consistent theme that preservice agriculture teachers lacked science knowledge to integrate science into their classes, and science teachers lacked agricultural knowledge to integrate agriculture into science classes. Traditionally, teaching methods courses are taught in isolation within specific domains or disciplines, and they do not teach preservice teachers how to

teach using interdisciplinary or integrated approaches by mixing domains such as agriculture and science. Although the integration of science and agriculture has been studied by many researchers in agricultural education, few researchers have studied how STEM can be taught using an integrated and interdisciplinary approach through agriculture, food and natural resources. As such, a new graduate course was developed and taught to help preservice youth educators in a college of agriculture learn how to teach STEM through AFNR. Preservice youth educators planned an integrated lesson and delivered it to fifth grade students in an afterschool program. Preservice youth educators reflected on their teaching and learning experiences and shared their personal schemas of integrating STEM through FANR. Preservice youth educators described their experiences were engaging, meaningful, and motivating; yet, they experienced challenges of delivering integrated learning experiences within the time constraints of the afterschool program.

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Sunn Hemp as a Model Plant for Experiential Teaching and Learning

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There is a need for developing teaching tools for the study of plant and nematode biology. Sunn hemp (*Crotalaria juncea*) (SH+), a tropical leguminous cover crop, could meet these needs. For the purpose of learning the effects of SH+ on soils, experiments were conducted on the Kauai Community College (KCC) campus in the field in Spring 2013 and Summer 2015. Shadehouse experiments were also conducted at KCC in Summer and Fall 2013, and at the National Tropical Botanical Garden in Fall 2015. A high school outreach was conducted at Kauai High School (KHS) in a classroom laboratory in Fall 2014. Field and shadehouse 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-) treatment 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. In the field and shadehouse, SH+ reduced seed germination when seeds are seeded immediately after mixing SH+ and soil. In the shadehouse, 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+ and concluded that SH+ increases Rhabditidae number in soil. Thus, instructors could use SH+ as a teaching tool for plant and nematology related courses in colleges and high schools.

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Gridiron Challenge: Utilizing Sport as an Educational Platform to Reduce Cultural Gaps in Colleges of Agriculture

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The cultural gap between collegiate faculty and student athletes is vast. In fact, faculty stereotypes toward athletes have long been documented. However, while most research focuses on faculty perceptions, student athletes have also experienced direct bias. Simons (2007) found 33% of student athletes surveyed stated professors treated them negatively, 61.5% were given a hard time when requesting course assistance due to sport, and 62.1% reported faculty making negative remarks in class. To address this cultural divide, College of Agriculture faculty at a southern land grant university collaborated with student athletes to design The Gridiron Challenge. This innovative cultural immersion program was informed by the Cognitive Cultural Competency Process, utilizing experiential education techniques to immerse collegiate faculty, staff and students into life as a "student athlete." In return, student athletes became the participant's professors. The program's purpose was to diminish stereotypes, enhancing the understanding and competence of each other's culture – ideally reducing the cultural gap. Through this intensive experience, a stronger academic community was

formed. Additionally, faculty and staff participants gained a deeper understanding of student athlete academic expectations and intense schedules. Furthermore, student athletes better understood the complexities of professorial life. Throughout their presentation, researchers will outline the development of this innovative program, discuss results and implications within Colleges of Agriculture and highlight educational lessons learned when implementing such a program.

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Assessment of the Bioenergy Minor at Oregon State University

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Implemented in 2012, the interdisciplinary bioenergy minor provides students with skills to address the US need for sustainable alternatives to fossil fuels. The minor is open to students in all majors and requires a significant mentored research project. Evaluation of the program assessed how well students were achieving four program learning outcomes. Pre-Post surveys were administered to students new to the program at the beginning of each term and again at the end of each school year. Students responded on a Likert-type scale to statements based on the learning outcomes, and answered open-ended questions. ANOVA and two-tailed t-tests were used to determine p-values, with results indicating statistically significant increases from the pre- to post-surveys on all of the learning outcomes. For example, "Understanding of the core concepts of bioenergy" increased from 2.63 to 4.17 on a 5-point scale (p-value <0.01), with 4-5 representing "Excellent". Understanding of qualitative and quantitative research methods both scored highest (4.22) of all outcome statements. Specific experiences contributing to those increases were research experiences and courses. Students indicated aspects of the program important for their persistence and engagement included making a difference in the world, sustainability, networking, and others. Open-ended responses indicated students gained skills, particularly in communication and experimental design. Students most often reported gaining soft skills in problem solving and self-management. Survey

data are being used to ensure the minor is meeting the program objectives, and to help create a framework for other institutions looking to develop similar programs.

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Increasing Youth Involvement in Agriculture, Food, and Natural Resources through Extension Support in Formal Education

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The majority of the youth population is detached from agricultural production and therefore unaware of the impact that agriculture, food, and natural resources (AFNR) have on their lives and the viability of their communities. Studies show that urban youth living in designated food desserts, who can benefit significantly from agricultural literacy interventions, are the most disenfranchised group and are unaware of the career options available. It is the responsibility of the U.S. cooperative extension network to provide resources and services to local communities, including reconnecting this generation of youth to agriculture in meaningful ways. Guided by the theory of planned behavior, which describes how the interaction between personal and environmental norms can be used to predict intentions, this program sought to impact participants' perceptions, attitudes, knowledge, and intentions about AFNR by connecting agricultural and food systems to their formal curriculum. An Extension Scholar partnered with an urban secondary wood shop program to conduct four introductory lessons on the aforementioned topic. The objectives for this program were: 1) To explore how AFNR can improve the quality of life by providing solutions to current environmental and food sustainability issues; and 2) To provide a mechanism for urban youth to explore 21st Century careers in AFNR. By integrating extension programs into formal education, a synergistic relationship can be established between requisite education, academic and career exploration, and local community issues addressing food sustainability. The poster will discuss the lessons presented and how participants' perceptions, attitudes, knowledge, and intentions changed post intervention.

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Academic Entitled: What do Students and Faculty Think?

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Faculty are increasingly asked to accommodate student needs and preferences related to the growing occurrence of academic entitlement behaviors of college age students. These behaviors may include students lobbying for higher grades, asking for concessions that relate to their needs, requesting class notes, or asking for grades they have not earned. Other researchers defined academic entitlement as "the tendency to possess an expectation of academic success without taking personal responsibility for achieving that success." This study examined the entitlement expectations of agricultural students and faculty at the University of Arkansas. Using a previously validated 6-point scale to assess academic entitlement (AE), participant responses on average tended toward "slightly disagree" for students (M = 2.66, SD = 1.18) and faculty (M = 2.71, SD = 1.09). Among the most highly endorsed items by students was "if I have explained to my professor that I'm trying hard, I think he/she should give me some considerations with respect to my course grade" (M = 3.97, SD = 1.29). However, for faculty it was "I treat students poorly when I cancel an appointment on the same day as we were supposed to meet" (M = 4.67, SD = 1.33). Of the personal entitlement items, 31.4% of students agreed that "I demand the best because I am worth it" and 33.8% agreed that "great things should happen to me". Recommendations include integrating AE instruction and objectives into the entering student orientation course to assist students with more realistic expectations.

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Effectiveness of Course-Embedded Research to Address Multiple Student Learning Outcomes in an Analytical Chemistry Course

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Undergraduate research is one of several high-impact practices proven to engage students in meaningful learning experiences through enhanced faculty-student interactions. It has been well-documented that the introduction of undergraduate students to authentic scientific research experiences lead to significant development in general skills (e.g. oral, visual and written communication) as well as specific research-associated skills (e.g., experimental design and data analysis). An authentic research project examining the potential for bisphenol-A and bisphenol-S exposure in thermal receipt paper was integrated into the lecture and lab curriculum of an analytical chemistry course. The project was designed to help address course learning outcomes focused on analytical separations and chromatography as well as program learning outcomes focused on quantitative reasoning, critical thinking and communication skills. Upon completion of the project 85% (n = 12) of the 14 students successfully answered exam questions on the use and application of chemical extractions and liquid chromatography in academic research. The majority of students felt that the course experience intensified their sense of engagement with faculty (57%, n=8) and led to increase confidence in their ability to engage in research activities (64%, n=9). Assessment of student laboratory notebooks and a final poster presentation using AAC&U VALUE rubrics found that 79% (n=11) of students achieved an overall score of 3.0 or above on each of the five dimensions for written communication and critical thinking. Additionally, 71% (n=10) of students achieved an overall score of 3.0 or above on each of the six dimensions for inquiry and analysis.

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A Holistic Evaluation of Supplemental Instruction in Introductory Science Courses on Student Learning and Success

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Supplemental Instruction (SI) is a peer learning program used in higher education institutions to reduce student attrition in barrier courses, improve student learning and develop cognitive capabilities necessary for lifelong learning. In 2014 a SI program was developed to reduce attrition between semesters (31.7% over 10 years) in a

two semester general chemistry course sequence. In 2015 two, two semester general physics course sequences were added to the program. The overall goal was to develop metacognitive capabilities and personal skills such as critical thinking, note taking, problem solving and organizational/time management necessary for successful completion of these courses and future coursework. In the first three semesters of the SI program 37.1% (n=101) of the 272 students attended at least 1 SI session. All students who attended at least 4 sessions (n=28, 10.3%) earned a passing grade and noted improved self-efficacy, cognitive skill development and metacognitive capabilities. During the first two years of the program SI leaders (n=8) have reported significant improvement in their own communication skills and metacognitive capabilities as a direct result of leading SI sessions and completion of a course on supplemental instruction leadership. Although the program has been successful faculty have noted the need to increase student utilization and consistent participation of SI sessions throughout the semester. As the program enters its 3rd year we plan to add introductory biology courses with a long-term goal to institutionalize the SI model and recruit new faculty to participate in the continual development of the SI program.

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Students Use Portfolios to Gauge Effort and Achievement in a Plant Identification Course

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While learning scientific names is an arduous task, it is a necessary requirement for students in horticulture. Memorization of scientific and common names determines much of a student's achievement in this type of course. For this case study, undergraduate students in an herbaceous ornamentals class were asked to document their meaningful and mindful effort and achievement when employing several learning strategies throughout the semester. At the end of the semester they were required to reflect on the effectiveness of these strategies in learning plants as they compiled an "effort portfolio" as part of their

grade. The data collected from these effort portfolios identify several learning strategies (researching plants, repeated practice quizzes, and working with others) considered by students to be the most effective to support their learning. Student reflections in their effort portfolios aligned with instructor's expectations - strategies that required thinking--meaningful and mindful effort-- were the most effective. Students' self-discovery about their abilities to learn can initiate an upward spiral of ever-increasing academic performance resulting from focused and effective effort.

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Mind Yourself: A Case Study in Celebrating Self-Management Skills

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Self-management skills, based lifelong learning and adaptability, help students proactively navigate the working world and successfully manage the career-building process. Mindful presence of one's environment, work ethic, and personal motivation helps promote positive attitudes and behavior that may affect workplace success. For example, when working in a foreign culture, social status and cultural strata may dictate speaking order (gender- or age-based dialogue) in formal and informal conversations (mindful presence). The National Institute of Food and Agriculture (NIFA) deemed students' self-management skills a highly important outcome in all NIFA-funded projects. This case study allowed us to examine students' understanding of self-management skills as a result of an international agricultural study abroad program. Students from two U.S. universities participated in a four-week study abroad program in Sub-Saharan Africa. Thirty students' pre- and post-travel reflections provided insights on their understanding of self-management skills. Content analyses of the data showed students' pre-experience beliefs about self-management skills were closely tied to self-sufficiency and independence (to work without constant oversight); self-motivation was also deemed important for self-management skills. Following their study abroad program, students' views

shifted focus to flexibility as a critical attribute of self-management skills. They perceived that increased tolerance for changing conditions was highly beneficial for adaptation to intercultural situations, an educational factor not to be ignored in study abroad. Other post-experience beliefs included self-awareness, organization, and attitude control. Practitioners can implement programmatic and educational strategies that enhance understanding of self-management skills and better prepare future agriculturists to meet NIFA's challenge of soft-skill development.

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Students Predicting and Reflecting on their Achievement in a Plant Identification Class

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Research has shown that people tend to be less certain in tasks that are difficult, possibly leading to reduced self-confidence. Learning the scientific names and cultural information of more than 200 herbaceous plants is considered difficult by many undergraduate students in horticulture. The challenge of memorizing and identifying herbaceous plants requires considerable effort. The objective of this study was to assess student's ability to predict their achievement in identifying plants. Forty-seven students were asked to predict the number of plants they would correctly identify before and after eight quizzes during the fall semesters of 2014 and 2015. In both years, the majority of students' actual achievement was higher than their initial predictions. In general, their achievement was also higher than their prediction after the quiz. Based on these results we conclude that undergraduates in plant identification classes frequently underestimate their ability to learn plants. This work has implications for how we can help promote greater self-awareness and confidence that encourages students to learn more effectively.

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Collaborative Peer Developed Textbooks in Science, Technology, Engineering and Math Education

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The use of open source textbooks has grown in higher education and self-education. Open source textbooks have been created by single authors and in collaboration with students. Creation of such textbooks incorporate content contribution as part of the course assignments. In contributing to open source textbooks students engage in active learning and higher levels of knowledge development. The purpose of this study was to evaluate perceived learning in creating an open source collaborative text relative to a traditional textbook. Students in a lower division nutrition course were assigned to contribute to sections of an open source textbook using the WIkibook web service. Students were survey in week 14 of the course using a brief questionnaire comparing the Wikibook to a required textbook. Questions evaluated a) use of, b) reliance on, and c) perceived effectiveness of the traditional text relative to the Wikibook. At the end of the term 246 students completed the survey. Of the 246 students, 135 students reported using at least one of the texts. Relative to the traditional textbook 49%, saw no difference in the contribution of the Wikibook to learning; 23% reported it contributed more, and 28% reported it contributed less. A free open source collaborative textbook may be a viable alternative to traditional textbooks. Further assessment of such a course resource at a more developed stage is warranted.

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Undergraduate Agricultural Business and Agricultural Economics Programs: How Do We Identify?

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Contemporary agricultural economics and agri-business departments have evolved in support of the land-grant mission and stressed the importance of developing curricula that match the needs of the fast-changing world of agribusiness. Academic departments routinely undergo undergraduate curriculum revisions which are based on institutional factors including faculty perspectives and attitudes, employer and alumni feedback, and peer institution curricula. We have observed a gradual transition from agricultural economics to agribusiness programs over the past 40 years, from a technical agriculture emphasis toward an interpersonal skills and business focus. We collected data on undergraduate agricultural economics and agribusiness programs from all U.S. 1862 and 1890 land grant university websites. We find that academic programs identify through the program name, concentrations, and/or specializations offered. We find 17 agricultural economics programs, 35 agribusiness programs, and six "hybrid" agricultural economics / agribusiness programs (=total 58), with 21 distinct names. Looking more closely at the programs, we find 65 different areas of concentration, with the main focus on agribusiness. On one side, the vast variety of areas of concentration allows for branding opportunities, but if students opt for no concentration, they can create more flexible curricula. Furthermore, we investigate whether there are differences in curricula by name. Relative to agricultural economics programs, agribusiness programs tend to place greater emphasis on business concepts such as law, finance, management, and marketing. Results are of use to agricultural economics and agribusiness programs as they continue to revise curricula and consider how their students can best market themselves upon graduation.

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Using a Flipped Classroom to Facilitate Course-Related Student Research

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Engaging students in research at primarily undergraduate institutions can be challenging. Faculty generally have heavy teaching loads that often do not include a formal research appointment. Opportunities exist to integrate research activities into courses; however, in the traditional lecture-lab format, time constraints often limit research activities to mini-projects/experiments, analysis of existing datasets, and literature reviews. The objective of this study was to evaluate the use of a flipped classroom teaching approach on the integration of an in-depth research experience for upper division undergraduate students in a Soil Physics course. In a flipped classroom, all content and technical information are provided through online video and materials that student are responsible for outside of class. In the Soil Physics course, the in-class time followed a studio model (two longer blocks of time) and was devoted to a semester-long research project on the impact of land use changes on soil physical properties. In teams, students made field measurements, conducted laboratory experiments, analyzed their own data, and collectively assembled and presented a poster of their results at a local event. A survey of students (n=12) showed that 83% of students felt the online videos provided a higher quality learning experience and 91% indicated the research experience was both enjoyable and valuable. Despite no significant difference in overall student performance when compared to the traditional teaching approach, the flipped classroom environment provided a structure and offered flexibility to conduct a meaningful research experience that could not have been accomplished in a traditional classroom setting.

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Effectiveness of Online Instruction

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Classroom instruction is progressing from the traditional face-to-face model to include online delivery. Online courses are often chosen by students for convenience and flexibility. Some instructors find challenges in engaging online students in discussions and individual connections. While the perceptions of students and instructors influence motivation and personal opinions regarding online instruction, it was necessary to assess student evaluations for face-to-face instruction compared to online delivery. Multiple sections of an undergraduate general education economic systems course, World Food and Society, were selected for comparison. This course was offered as face-to-face/online, fall/spring/summer, and 4-week/8-week/16-week options. Students were

given the opportunity to rate instruction for each section using an evaluation tool, IDEA. Comparison of several years of course offerings shows that student ratings resulted in no significant difference in categories of progress toward objectives, excellence of course, stimulating student interest, and classroom structure. There was a significant difference in student rating for foster student collaboration for traditional versus online delivery. For insight into academic learning, students were also given a pre-test and post-test for assessment. When all sections were averaged, no significant difference was identified between face-to-face and online sections for student learning. Student self-reflections often indicate regret for selecting online sections due to missing classroom interactions and discussions. Regardless of instructor or student perception, student assessments and ratings for World Food and Society showed online delivery as an effective instruction method.

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Building Ecological Literacy through Challenge-Based Instruction and Culturally-Relevant Pedagogy

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Well-designed challenge-based instruction is a valuable tool in building ecological literacy, especially when combined with culturally relevant examples or issues, which allows students to draw from a wider pool of pre-existing knowledge or experience, and engages students toward deeper understanding as they can connect that concept to their own lives. A CBI exercise would begin with a well-designed 'starter': a period of observation of a particularly interesting, locally relevant phenomenon or problem relevant to a particular scientific concept or principle that may strongly illicit a student-centered response. In ecology courses at a federally designated Hispanic Serving Institution in a rural agricultural area in south Texas, examples of the cotton pink bollworm can be used as a starting point for evolutionary ecology, the soybean aphid presents the idea of exponential growth, and biological control starts discussion on population dynamics. With proper facilitation, students articulate their ideas about this specific phenomenon to their neighbors, add evi-

dence through testing and observations, and distinguish and communicate possible explanations. Through the use of clicker technology (or cell phones), students can share responses, and illustrate where there might be confusion of certain concepts. In many cases there are conflicting answers, which has prompted a class wide discussion of the responses. Many respondents to the end of term survey specifically mentioned that they enjoyed this process, stating that by defending or discussing the class responses they "learned a lot about their own work, especially when [their peers'] response contradicted their own".

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Cultivating Evaluative Thinking by Engaging Students in Culturally Responsive Collaborative Assessment

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As agricultural educators strive to cultivate student success by engaging learners with innovative pedagogical practices, they also have the opportunity to foster higher order thinking skills and motivation in students by engaging students in the assessment process as well. We present insights from the field of collaborative and participatory evaluation, drawing especially from recent advances in culturally responsive evaluation, to demonstrate how engaging learners in the assessment process can foster student engagement in the learning process. We propose that doing so can allow for more dialogical engagement and more responsive student assessment—providing a much-needed detour from the status quo. Collaborating with students on the assessment of their learning can help educators scaffold student agency in the learning process and create new spaces for students to contribute to their own educational experiences. Engaging students in assessment can also develop their critical and evaluative thinking skills, while simultaneously increasing the validity and utility of student assessment. This has the potential to foster generative learning spaces characterized by meaningful engagement, critical reflection, evaluative thinking, and continuous learning, in ways which are also culturally responsive. Our presentation goals are to: (1) introduce the theoretical

underpinnings of the collaborative, participatory, and culturally responsive approaches to evaluation, (2) discuss potential benefits of engaging students in collaborative assessment, and (3) offer specific strategies for engaging students in the assessment process.

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Evaluation of an Online Master of Food Technology (MFT) Degree Program and Associated Courses

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A survey was distributed to students enrolled in the recently developed Master of Food Technology (MFT) program at the University of Georgia targeted to working professionals. The objective was to determine what aspects of the program and courses are effective, what areas need improvement, and to determine if learners are achieving the desired learning outcomes. Overall, students indicated that they were pleased with the program, especially the convenience of it being completely online and the affordable cost. They also expressed satisfaction with course and program structures. An area that needs improvement is communication between students and between students and instructors. Respondents indicated that they would like more discussions and video chats and more detailed, meaningful, and timely feedback from instructors. Another improvement to the program that should be made is to increase the link between course content and industry practices. Many students expressed a desire to learn more about application of principles learned in the courses and for the course content to be more practical.

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Grounding the New/Beginning Urban Farmer: Identifying Gaps in Educational Resources

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Best management practices for new and beginning farmer programs have been identified previously. However, this study identified educational areas of need for new and beginning urban farmers in Baltimore City. The Delphi technique was used with a panel of 14 experts in urban agriculture. There were three rounds to the survey. Round 1 involved an open-ended questionnaire. After receiving responses, the researchers categorized specific issues into themes for inclusion in the second round questionnaire. In round 2 subjects received the synthesized list of themes and were asked to rate their level of agreement on a Likert-type scale (1= strongly disagree, 2=disagree, 3=agree, 4=strongly agree) with each item. Issues rated at the agree level (.80 or higher) were considered consensus and were retained for inclusion in the third round questionnaire. During round 3, participants were given feedback from round 2 and asked to provide an ordered list from each theme, with a weighted score given to each item based on Likert ranking. Each participant was given the option to re-order the supporting list in order of importance. Following analysis of the list, conclusions were drawn regarding recommendations to stakeholders. Results indicated that the methods for delivery of professional development education varied based on the topical area. The areas of Network of Farmers, Production Knowledge, and Community should be face to face instruction, while urban specific information, tool sharing, and soil safety could all be presented in website or lecture format.

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Using the "Infomercial" as an Educational Tool

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Development of the "soft skills", particularly in technical courses, is often a secondary consideration. Yet, employers consistently report that soft skill development and creative problem solving are paramount to employee performance and success. Seeking to incorporate soft skill development and creativity with acquisition of technical knowledge, we adapted the dreaded infomercial into two unique creative assignments allowing students to learn about animal health and work on developing teamwork and communication

skills. Students formed small groups and were asked to develop a short, (10-minute) creative video infomercial that would not only educate but entertain the audience, aka the class. Instructions were intentionally ambiguous indicating only that the infomercial must be accurate, informative, and focused on a specific aspect of animal health care. We stressed the importance of creativity and out-of-the-box thinking, which was rewarded heavily (up to 50%) in the final project grade. A second variant of the infomercial assignment asked students to "Sell me that animal health care product". Here students were assigned an animal health care product to research and "sell" to the audience (class). This required students to be knowledgeable of the product, identify key selling points and communicate this information directly with the class. We found students were more comfortable with this assignment if it followed the video assignment. A small percentage (< 5%) of students reported dissatisfaction with this learning technique, while most were somewhat to highly satisfied that it improved their teamwork and communication skills. Students also reported developing organizational skills and enhanced creativity.

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Urban Agritourism as an Educational Venue Addressing Local Food Insecurity

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Urban food insecurity and food justice are prominent concerns throughout the United States. In an effort address these issues, colleges of agriculture and local community organizations regularly collaborate to provide agricultural education and programming, technical expertise and economic backing. While this format provides local support and innovation, its educational impact is limited in nature, leaving one to ponder, "Could innovative urban agriculture initiatives have a regional/national educational impact through tourism?" Researchers at one southern land grant institution explored this question through the concept of urban agritourism. Using (City, State) as a case study, researchers identified innovative organizational and neighborhood initiatives, framing the holistic movement as a form of educational agritourism. For example, grassroots initiatives

such as farmer's markets, gorilla gardening, yard farming, gleaning programs, and consumer education were highlighted. Researchers will discuss the complexities of developing such a conceptual model for urban agritourism as well as highlight the educational enhancement such a model can provide.

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Measuring Student Outcomes in an Animal Handling Class

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Animal science departments historically prepare a large percentage of their undergraduates to apply to veterinary school or work in animal industries. In some cases, entering students do not have prerequisite essential skills in handling animals. One of the objectives of the University of Arkansas Department of Animal Science is to offer students a variety of opportunities to learn and practice hands-on skills sets with a variety of livestock species. Pre- and post-tests were developed to assess the knowledge and hands-on abilities of students who were enrolled in an Animal Handling class. In an effort to determine competency in skills before and after participating in the class, the results of post-tests will be used to inform future instruction. Students enrolled in the class were tested over their ability to competently halter and take temperature, pulse and respiration for both horses and cattle. Additionally, students were asked to identify where the rumen was located on the cow and the cecum was located on the horse. Pre-test scores for the horse skills assessment (n=18) revealed an average score of 31%, while post-test scores averaged 93%. Pre-test scores for the cattle skills assessment (n=18) revealed an average score of 33%, while post-test scores averaged 70%. Because current undergraduates do not have the animal handling skills of their predecessors, this study highlights the importance of including animal handling requirements in the animal science curriculum.

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Experiential Learning: Preparing Agriculture Majors for the Agriculture Workforce

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Research identifies the need to enhance college students' interpersonal and leadership skills. This project purpose is to be prepare students for graduate studies and the agriculture workforce. To meet this goal, undergraduate agriculture majors are involved in experiential learning experiences which allows, "Learning through reflection on doing". This three-year project (2014-2017), includes ten students each academic year, which is now in year two. Objectives include: 1-providing experiential learning experiences, 2-identifying leadership styles; and 3-participating during tours of land grant institutions' graduate programs. Activities provided to meet the objectives include completing readings and completing assessments via Strengths Quest to identify leadership skills, completing elevator speeches, attending seminars (Public Speaking), Governmental issues (University's Director of External Affairs), and attending conferences. A survey (pre/post) was developed to capture students' perceptions on leadership and interpersonal skills knowledge. Data was analyzed to report descriptive data for the cohort 1 and 2 (n=18), and preliminary findings include: Fifty-five percent reported being aware of different leadership styles, and what it takes to be a leader. Most (66%) reported knowing what takes to be an effective leader. Few understood how to demonstrate balance between leadership responsibilities, family, and outside activities. Many reported developing leadership skills through participation in club activities. As employers report the need for college graduates to be able to problem solve and exhibit interpersonal skills (oral/written communication skills), this project will continue to prepare agriculture majors for the agriculture workforce which is recommended to meet the vast career opportunities in the field.

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Variables that Affect Retention Rates in the Agricultural Institute at North Carolina State University

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Student retention is a growing problem for institutions of higher education as faculty and administrators seek ways to enhance graduation rates. In the Agricultural Institute, a two-year program at NC State University, the retention rates are extremely low when compared to the four-year agriculture program. Most studies examining influences on retention rates have focused on four-year public and private institutions. Consequently, research was conducted to determine the best predictive model for the dependent variable of student retention as related to the following independent variables: ethnicity, age, gender, high school and first term college academic performance, ACT score, SAT score, parents' educational attainment, use of financial aid, and place of residence (rural vs. urban and distance from school). Data in this study were drawn from the Office of Enrollment Management and Services records for the 2009-2014 fall cohorts, consisting of 601 students. Initial findings indicate that males were significantly more likely to drop out of the program and those who struggled academically their first semester were at a heightened risk of discontinuing their education. In addition, those who lived in nonmetropolitan counties, based on the USDA Economic Research Service's rural-urban continuum codes, were also significantly more likely to drop out. Identifying factors such as these that affect retention rates are essential for the development of policies and procedures to help students reach graduation. It is recommended that university administrators work closely with first semester students through offering additional programs such as student mentoring and courses to enhance study skills.

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SOFT and the Noelani First Grade Gardeners

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Established in 2007, the Sustainable and Organic Farm Training (SOFT) program is a student-managed farm supported by the College of Tropical Agriculture and Human Resources (CTAHR). Students developed SOFT with support from the CTAHR faculty and administration—as an innovative teaching approach—while also creating a physical place to put theory into practice. SOFT participants (SOFTies) engage in a variety of co-curricular learning activities, including vegetable production, composting, apiculture, and marketing. SOFT is integrated into several CTAHR courses, and SOFTies have the opportunity to teach agriculture to younger students. An example is the Noelani First Grade Gardening program. Initiated in 2009, the Noelani First Grade Garden is a place-based education program developed collaboratively by SOFTies and the Noelani Elementary School teachers. Garden activities center around four STEM topics: Photosynthesis, Soil, Nutrition and Food Safety. Fifty to Sixty students are engaged monthly each semester to produce a "soup" or "pizza" themed garden that is the center piece of an end-of-semester party. Outcomes include approximately 420 first grade students with an improved awareness of basic plant science and food production and a gross estimate of ~190 volunteer hours on behalf of SOFTies.

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Impact of Community Viability Grants on Education

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With a growing number of careers in agriculture, there is a demand for education based on science, technology, engineering, and math (STEM). However, recent projections by the United States Department of Agriculture predict a significant deficit of individuals equipped with the knowledge needed to succeed in these positions. By building viable rural communities and collaborating with land-grant universities, we can empower citizens to take a greater interest in agricultural issues and careers. The purpose of this study is to assess the impact of community viability projects on participants and their communities. Utilizing the community viability indicator conceptual framework, this evaluation aimed to explore how four grant projects influenced capable leaders, sustainable infrastructure, community sentiment, and community vision within communities. The first grant project sought to connect leadership discourses with community leaders and their respective partnerships. Another, bridged the gap between secondary agricultural teachers, the university, and extension outreach efforts by developing agriculturally-based curriculum for youth. A food-shed project engaged stakeholders across three states in conversations relating to agricultural issues. The final project focused on the education of youth in stewardship, sustainability, and the interconnectedness of food, health, and the environment both within and outside of the classroom. The overall reports and observations provided advances in the fields of leadership and agricultural education for a variety of youth and community members. The project findings and outcomes supported the overall need for further support of community initiatives that promote community viability and educational gains of all community members.

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Digital Tools to Teach Chemistry in Agriculture

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Chemistry is everywhere – even in agriculture, but while most agricultural majors require chemistry, students are often poorly prepared and unenthusiastic about this subject and may not understand how chemistry applies to their majors and careers. Faculty lose valuable time in the classroom when they must address pre-requisite concepts and spend time reviewing material that the students didn't retain from chemistry. There is tremendous potential for digital, game-based and interactive instruction in agriculture classrooms,

particularly to help students visualize some chemical concepts as applied to the animal, plant and soil science disciplines. After discussions with agricultural faculty, we generated a list of chemistry concepts that commonly challenge our students. We then created three educational animations to be used in or outside of class to introduce these concepts using specific examples from agriculture. In "Everything is Chemical", we show how all plants, animals and the environment are comprised of atoms and molecules and that the way just a relatively few elements are combined or bonded affects their state and use. "Cation Exchange" and "Nitrogen" animations illustrate specific processes and properties of the soil and nutrient cycles. By seeing some of these ideas early, we hypothesize that students will be more engaged and less resistant to learning chemistry since they will know how important and useful it will be to them. The products will be integrated into introductory and upper level courses and will be evaluated using pre- and post-testing. All modules are posted online for free use at ScienceofAgriculture.org

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Awareness and Utilization of On Campus Student Services for First Year Students

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Universities and colleges invest in many student resources to make sure that students can perform to the best of their academic, physical, and mental abilities. Students are introduced to many of these resources during a two-day orientation with detailed follow-up and instructional activities provided during first year seminar. To assess if the current strategy for introducing resources is effective, it is valuable to determine the level of awareness the students hold about these resources and the services they provide at the start and end of their first semester on campus, in addition to the utilization of these services. An online retroactive pre- and post- survey was administered to students enrolled in the College of Agricultural Sciences First-Year Seminar at the conclusion of the fall semester in 2014 and 2015 for a total response of 264 students. The survey results highlight the awareness and utilization of: student ser-

vices (7 items), engaged scholarship opportunities (5 items), as well as their level of satisfaction with any of these resources utilized. Student awareness and satisfaction were measured on a five point Likert-scale. The data indicated: 1) students were much more aware of the resources available to them at the end of the first semester, 2) students were knowledgeable of the services offered by the various resources, and 3) students were overall very satisfied with the university or college services they utilized during their first semester. Findings of this study are aligned with the framework of William McGuire's Model of Behavior Change.

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Environmental Literacy and Student Performance: Lessons Learned from a Professional Development Intervention

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Building environmental literacy among youth can equip them with the tools necessary to solve complex global problems around issues like sustainability and climate change. Prior work with pre-service agriculture teachers indicates a lack of environmental education self-efficacy and environmental science content knowledge. Over a two-year period, 50 teachers participated in a six-hour Project Learning Tree (PLT) workshop aligned with [state] curriculum objectives to assist with efforts to build environmental literacy among high school agriculture students. Teachers were randomly assigned to a treatment (n=35) or control (n=25) condition, with control teachers delaying the PLT workshop (and treatment condition) to the second year of the program. Once trained, teachers were asked to teach five units of the PLT curriculum within the environmental science unit of an introductory agriculture course. Measures of environmental literacy and environmental content knowledge were collected from the students at the beginning and end of the course. Although teachers held positive perceptions of the PLT workshop, no significant differences in environmental literacy or performance were seen between the treatment (n=1,484) and control (n=1,225) conditions among students. Results indicate the need for a more intensive training intervention including more contact hours with

workshop participants and longer duration of PLT training. Recommendations for further research include the establishment of a more valid measure of environmental content knowledge, confirmation of the implementation of PLT activities used by teachers, and the development of unique ways to increase the potency of a professional development intervention on students.

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An Undergraduate Research and Mentorship Program in the Natural Resource Sciences

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Colleges of agriculture have been challenged to provide undergraduate students with research opportunities to help foster the development of 21st century skills, such as critical thinking, problem-solving and communication. As a result, many have considered and implemented undergraduate research programs, and the literature has shown these research experiences can increase overall academic success among students. One common factor among undergraduate research experiences is mentorship by faculty members. However, many faculty were never trained as mentors during their graduate programs, thus they learned through trial and error. Consequently, faculty should consider implementing programs to help graduate students hone their mentoring skills. The purpose of this abstract is to describe an undergraduate research and mentorship program in the Borderlands Research Institute at Sul Ross State University. This unique program is structured using a three-tier hierarchy where undergraduate researchers are mentored by graduate students who are in turn mentored by faculty members. The goals of this program are to provide quality research experiences for undergraduates, while supplying professional development in mentoring to graduate students. Under the guidance of graduate students, undergraduates are required to conduct scientific research and present their work at a research symposium specifically created for this program. Many of the undergraduate projects have been offshoots of graduate students' theses work. This program was initiated in spring 2015, and to date eight undergraduates

have completed under the advisement of six graduate students. Further data is being collected to determine the efficacy of the program for both undergraduate and graduate students.

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Fern Propagation: An Experiential Learning Component

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Ferns are unique land plants because they have two distinct sporophyte and gametophyte stages. In fall 2015 an internship on fern propagation was carried out at the National Tropical Botanical Garden, Kauai. The internship was a part of a credit course, Plant Bioscience Internship (PBT 290V), enrolled/offered for partially fulfilling the requirements for an Associate Degree in Plant Biology and Tropical Agriculture (PBT) at Kauai Community College (KCC). One of the student learning outcomes (SLOs) of the internship project was to demonstrate the ability to work in a professional setting through an experiential-learning environment. Fern spores were observed under the microscope, sporophyte and gametophyte stages were identified and sporophyte stages were separately sown on three sterilized medias: (i) vermiculite, (ii) Sunshine potting mixture and (iii) sphagnum moss. Effects of media on fern propagation did not observe. However, a comparative fern propagation technique was practiced and concluded that fern propagation method could be included as a component of individual study type of courses such as PBT 290V. First learn about spore propagation techniques and understand the live cycle and reproductive requirements of ferns. At the lab, did weeding gametophytes trays, transplanting sporophytes by sterilizing the soil, via adding boiling water to the soil. Meanwhile until the soil cooled down. I sprayed the pots with 70% alcohol and left them to dry before I added the cold sterilizing soil. Did also sterilize bass Vermiculite, Sunshine Mix #4, Sphagnum Moss, Coir (Coconut fiber) before planting fern seeds.

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Enhancing Students' Personal Growth with a Study-abroad Program in Food Science

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While personal growth is used to promote student participation in study-abroad programs, it does not necessarily happen unless the appropriate learning goals and experiences are purposefully integrated into the curriculum. Teaching strategies that support personal growth are reflection (journaling, debriefings, and facilitated group discussions), guided immersion into the country and controlled challenging situations, rich interaction with local communities, analysis of social issues, and service learning. The objective of this study was to assess student personal growth in a food science 10-day study abroad course, Coffee (el Grano de Oro): From Bean to Cup, and to explore which course experiences had best facilitated such growth. Data sources included 1) student (N=19) responses to a pre-and-post qualitative and quantitative instrument with questions on the course impact on student career goals, personal, global competency, and academic growth, as well as students' reaction to the formal and operational aspects of the curriculum; 2) a daily reflective journal; and 3) a group debriefing session on the students' learning experience. Preliminary analysis of data shows that there was interdependence between achievement of personal and academic objectives. For example, rich interaction with local coffee farmers shaped student personal growth (i.e., attitudes towards Costa Rica and others, communication and interpersonal skills, global competency, career choices), but also was key for depth and breadth of academic understanding of coffee systems. This synergy suggests that when appropriately designed, deliberate focus on student personal growth will further support student science and content acquisition, rather than "take away" time from academic goals.

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Effect of Teaching Platform on Student Performance and Motivation

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With the increase in the use of online learning, educators need to understand how the platform in which an instructor teaches a course will affect a student's performance and motivation throughout the course. The objective of this study was to determine how online and face-to-face lecturing affects both grades and the amount of time students utilize during and before starting an exam. To accomplish this, the same course was taught using three different platforms (face-to-face, online, and online during an eight-day mini-mester). Four exams were administered online throughout the semester, and students' (n=713) grades, test duration, and start time were recorded for each of the exams. Data were analyzed using the GLM procedure of SAS with the main effects of platform and exam number included in the model. Differences were detected ($P<0.01$) for all main effects for each of the recorded variables. Exam grades for students in the online mini-mester were lower compared to each of the long semester grades. Additionally, students took more time to complete the exams in the mini-mester compared to the other two platforms. However, students in the long semesters waited longer to begin their exam, waiting an additional 16 to 20% more of the total time until they began their exams. This data illustrates how the short duration of the mini-mester may not be conducive to online learning. In contrast, both long semesters were equivalent in all aspects recorded, indicating that students can perform similarly using either platform.

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Developing Research Skills in Undergraduate Students to Facilitate Admission and Success in Graduate Programs in Agriculture, Food and Related Sciences, University of Puerto Rico-Mayaguez

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The Undergraduate Research Program has facilitated student learning and skills acquisition for successful graduate studies in agriculture, food and related sciences. After undergoing a competitive process, ten (10) students were selected to conduct research under the mentorship of a faculty member during the 2014-15 academic year. All participants obtained three-credit hours and completed from six to nine hours of on campus research activities per week. Participants were required to conduct oral presentations at three stages of the program: research problem, progress report and final results. An instrument designed to measure skills obtained and participants' perception about the program was administered. Results show that on average, on a 1 to 5 scale, skills developed were: oral and written communications (4.75), follow instructions (4.75), time management (4.75), critical thinking (4.63), leadership (4.63), public speaking (4.5) and problem solving (4.38). All students consider the experience beneficial to their professional goals. Six (6) students (60% of participants) presented at a national meeting; two (2) of which held oral presentations and four (4) posters; and an additional two (2) students presented posters in local scientific meetings. At the end of the academic year two students completed the BSA program, one was admitted to the MS program in phytopathology at UPR-M and one was admitted to a DVM program in a mainland institution, while the remaining eight (8) progressed into their senior year. Thirteen (13) students are participating in the 2015-16 program. Eight (8) of them will present their research projects in a national meeting.

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The Effect of Student Motivation on Performance in Online Exams

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Online courses require students to be more self-motivated to ensure that they meet deadlines for assignments. As a result, educators need to understand how a student's motivation in a course will affect that student's performance during exams. The objective of this study was to determine how the start time of an online exam affected students' grades and test duration. To accomplish this, four online exams were administered throughout three semesters of an animal nutrition course and students' (n=713) exam start time, grades, and test duration were recorded for each of the exams. For each exam, the students' start time was categorized into one of four groups based on the percentage of the total available time that had elapsed before a student began their exam. These categories were Early (0-33% of total time; n=92), Middle (33-66% of total time; n=97), Late (66-95% of total time; n=259), and LastMin (95+% of total time; n=265). Data were analyzed using the GLM procedure of SAS with the main effects of and exam number included in the model. No differences were detected (P=0.20) in the total amount of time needed to complete the exam; however, LastMin students had lower grades (P<0.01) than all other groups. Additionally, students in the Middle group had higher test scores (P<0.05) than the Late group. These data illustrate that students under immense pressure of a deadline do not perform as well as other students. This lack of self-motivation likely is the reason for poor class performance.

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Using Field Trip Reports to Assess Students' Critical Thinking in a Freshman Plant Science Class

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Concerns in higher education continue to highlight the necessity to hone the critical thinking skills of students as they prepare for the work place and other professional endeavors. At the University of Maryland Eastern Shore, selected courses in the general education requirements were targeted for incorporating in each syllabus, a section on Definition of Successful Performance in This Course, emphasizing critical thinking. The freshman level course, Plant Science lab, was selected and one of the modules used to partially fulfill this requirement was a field trip to the university's Agricultural experimental station followed by a written lab report guided by a rubric which was included in the syllabus, discussed and given to students again at the time of field trip. The objective was for students to demonstrate accurate observations, recognition, and perceptions of the factors, values, and relationships in selected crop practices through writing.

A rubric comprised of six criteria and three proficiency levels was used for assessment. The criteria were recognition, observation, drawing reasonable inferences, articulation of the situation, perception and connection of relationships, and writing clarity and coherence. Over eight semesters, two instructors taught seven sections of the course to 105 students. Seventy-two to eighty-three percent of students demonstrated proficiency in all categories except, perception and connection of relationships (61%). This indicates room for improvement in increasing the critical thinking skills of all students to proficient.

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Conservation Farming in Zambia: A Model for Agricultural Extension Agents to Improve Food Security

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Conservation farming is a sustainable approach to food security for small-scale farmers in sub-Saharan Africa. This methodology has been shown to create a farming system that increases crop yields, reduces costly fertilizer dependencies, and minimizes negative impacts on the environment. This qualitative study examined a 27-month Peace Corps volunteer intervention in Zambia, and offers a model for Agricultural Extension Agents working to improve food security. The farming methodology was used in conjunction with seed-processing equipment acquired through grant funding. Specifically, farmers were trained in regard to conservation farming and oil-seed processing. The results supported the model as a positive approach to improving food security. A personal interview with a key informant showed that farmers increased their crop yields and reduced their dependence on fertilizers as a result of the model. The farmers were expected to attend a series of demonstrations and workshops prior to planting their own seed. In all, 10 out of 10 farmers indicated the workshops and demonstrations were an effective way to prepare for implementing conservation farming on their own. However, only one farmer planted the cash crop due to it being year one of seed bank establishment. Moreover, the farmers enjoyed processing the oil-seed because it enabled them "to have oil throughout the year." However, farmers voiced concern regarding "seed bank distributions." It was recommended that the lead farmer create a calendar illustrating specific dates for seed dispersal.

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Professional Development Needs of Traditionally vs. Alternatively Certified High School Agriculture Teachers

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Agricultural education is an essential element in today's public schools, yet a shortage exists amongst the supply of high school agricultural education teachers. Alternative certification programs are helping to meet the shortfall, but questions exist in regard to their preparedness. While all teachers need continual professional development, the researchers sought determine differences based on a teacher's route to certification. Survey instruments were distributed to participants at the 2015 Vocational Agriculture Teachers Association of Texas Professional Development Conference, attended by more than 1,200 teachers. Teachers identified their top three professional development needs in nine areas, such as animal science, plant science, SAEs, special education, and classroom management. Overall, the needs of the two groups varied only slightly. Common needs for both groups across all areas included new teaching ideas and laboratory activities. Within the nine individual areas, assistance with record books and integrating special education students into the agriculture classroom were most frequently cited by both traditionally-certified and alternatively-certified teachers. Identifying and engaging students in non-traditional SAEs was also a common response for both groups. The researchers concluded that there was not a vast difference in professional development needs based on a teacher's route to certification, but that those who plan such activities should regularly assess the needs of all teachers to adequate plan for professional development conferences and workshops.

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Leadership Styles of Successful FFA Advisors and FFA Programs

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Leadership development is a foundational component of agricultural education and FFA. A relatively new research topic is leadership styles, specifically targeting the leadership styles of FFA advisors. This study sought to describe advisors of successful FFA programs in terms of their leadership styles and how FFA advisors could use their leadership styles to improve their programs. The target population was FFA advisors whose chapter had received the Texas FFA's Golden Horizon Award in 2014. This award indicates a standard level of success and a well-rounded program: success in career development events, proficiency awards, state and American FFA degrees, high levels of student engagement in SAEs, etc. The Multifactor Leadership Questionnaire form 5X (MLQ5X) was completed electronically by advisors who had at least four years of teaching experience at the chapter receiving the award. The final data was derived from 107 participants. The predominant leadership style of FFA advisors from successful FFA programs was the transformational leadership style (M = 3.15; SD = 0.43), as opposed to transactional leadership (M = 2.45; SD =0.49), and laissez- faire (M = 0.86; SD = 0.55); thus, a teacher/FFA advisor who stimulates and encourages creativity, provides a role model for high ethical behavior, and instills pride in their students is likely to have a successful FFA program. This person further articulates a vision that is inspiring, communicates optimism about future goals, provides a meaning for the task at hand, and gives individual consideration to the student's needs in the area of self-development.

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Is Success in Leadership Development Events Simply a Numbers Game?

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High schools within each state are often separated by size prior to participating in competitions. Especially in athletics and academic events, schools are classified according to enrollment so that that they compete against similar-sized schools. Such is not the case in the FFA. Chapter membership in Texas varies from less than 50 members to more than 800 members, yet these chapters compete against all others regardless of their membership numbers. The Texas FFA State Leadership Development Events include 13 events in areas such as parliamentary procedure, FFA knowledge, agricultural issues, and public relations. State-qualifying teams advance through district and area levels, with the top two teams in each event at the area level advancing to state. Researchers examined whether chapters with larger memberships or more teachers experienced more success at the state competition. Chapters with two teachers had the largest percentage of qualifiers (41.96%), finalists (30.26%), and top 5 placings (36.59%), but chapters with three teachers had the most state winners (45.45%). No state winning teams came from single-teacher departments, one came from a four-teacher department, and one came from a chapter with more than four teachers. Regarding membership levels, chapters with 101-200 members comprised the largest percentage of qualifiers (32.87%) and finalists (30.26%), but chapters with 201-300 members achieved the most top 5 placings (29.27%); however, the 101-200 member chapters fielded more than half (54.55%) of the state winning teams. Only one winning team came from each of these: 51-100 members, 301-400 members, more than 400 members.

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Animal Science Instructors' Perception of Abilities and Capabilities of their Students

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Student learning can be limited due to the way in which a course is taught. No studies show lectures to be more effective than other teaching methods, yet college instructors still use lectures as their main teaching method. The purpose of the study was to determine if instructors of Animal Science courses at the University of Illinois Urbana-Champaign (n=20) were attentive to their

students' abilities and capabilities and in response taught courses in a manner to accommodate the range of Learning Styles (LS) and Multiple Intelligences (MI) of their students (n=447). It was discovered that 40% of the instructors had never heard of LS or MI and 45% had only heard the terms but were not familiar with them. Most participating instructors were interested in learning more about LS and MI in order to implement new methods into their courses, but mentioned four major obstacles including: Time, cost, effort and number of students. Most instructors see the importance and express the desire to implement methods to address them, but the main issue is time to alter their courses and knowledge of how to teach accordingly. Making instructors aware of their LS and MI as well as their students' would allow courses to be altered, encompassing a wider range of LS and MI. Providing resources, instruction and assistance to instructors about LS and MI and alternative teaching methods will help establish a course where learning is attainable to more students.

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Expanding Global Learning Opportunities: The Development of a Pennsylvania State Youth Global Food Security Institute

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Global competency is acknowledged as critical for the agricultural profession. Global learning is vital to increasing a student's ability to think critically, creatively and collaboratively in order to contribute to the solution of global problems such as food security. Engaging learners early to accelerate global learning is advantageous. A model global learning program is The Global Youth Institute offered by the World Food Prize Foundation, which provides two hundred secondary students and their mentors the opportunity to discuss food security issues with global leaders in science, industry and policy. Currently, two students from each U.S. state participate annually. In order to offer this type of transformative global learning experience to more students, twelve

states have created state-level versions of the Global Youth Institute. This study investigates the practices of the Global Youth Institute and the current state-level youth institutes. Structured interviews were conducted with the leaders of the global and state institutes. A thematic analysis was employed to review interviews to determine common themes and best practices among the institutes to develop recommendations for Pennsylvania to create a state youth institute. Findings were organized into a logic model to determine a course of action to develop a program to benefit secondary students, teachers, industries and the Pennsylvania State University. Findings indicate that securing key internal and external partners is crucial to program development. This research can guide the development of a Pennsylvania Youth Institute as well as serve as an example for implementing a similar program in other states.

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"Flipping" Towards Alternative Careers in Animal Science

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Many undergraduate animal science students attend college in anticipation of matriculating into the veterinary profession. There are currently only 30 accredited colleges of veterinary medicine in the U.S. with 2:1 seat availability for applicants. As a result, it is imperative that scholars are exposed to and prepared to pursue alternative careers to veterinary medicine. Here we implemented the "flipped classroom" approach to a course designed to focus on laboratory animal management and preparation for certification programs associated with the laboratory animal industry. This model allowed for more hands-on activities as well as the opportunity for practical application of lecture topics compared to conventional teaching methods. The course was designed such that students prepared for the course independently outside of the classroom, disseminated lab animal management focused case studies in groups during the class, and later performed weekly wet-labs to reinforce concept understanding. Effectiveness of the course was evaluated via Likert-scale survey among past and present students. Survey response data showed 80% of students agreed that the in-class activities encouraged them to think more critically, while

88% retained more information following the corresponding hands-on activities/wet-labs. The vast majority of students remained neutral in preference of "flipped classroom" learning in comparison to traditional lecturing methods despite an overall 75% of students rating the course as having provided them with information about an alternative career they had not previously been aware. The survey data here indicate the "flipped classroom" model is an effective approach to teaching alternative career opportunities in animal science.

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Innovate Approaches to Exploring Climate Change in the Pacific Islands

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The Pacific and Caribbean islands of the U.S. Insular Areas are highly vulnerable to changing weather extremes and climatic conditions. The land-grant colleges in these islands are geographically isolated, have relatively limited educational resources, and need access to diverse disciplinary expertise from the U.S. that are not available on-island. To address these challenges a pilot distance education project was developed at the University of Guam (UOG). The course has been offered two semesters at UOG with students from Guam, Yap, and Pohnpei. The objective of this presentation is to describe the relative benefits of available online education technologies and an assessment of the relative benefits of a more traditional classroom format compared to enabling students to provide more self-direction and leadership. A mix of online and in-person formats have been explored, including a "flipped-format" with asynchronous online presentations combined with real-time in-person class discussions. Significant use has been made of multimedia materials developed by NAS, AAAS, and NASA. Based on feedback from the students, we found that students were more interested in acquiring fundamental knowledge skills regarding climate science after exploring the potential impacts of climate change on their communities. Moreover, students became very engaged in the class and the course content matter when they were allowed to take the lead to develop their own projects. Students created their own Facebook website, developed a survey of 200 fellow students and provided presentations on what was being done in their respective communities.

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A Campus Seed Share Initiative: Using Local Partnerships and Place-Based Learning to Strengthen Curriculum and Community

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We created a community seed share as a place based learning initiative to enrich the agriculture curriculum, create opportunities for undergraduate research, and empower Leeward Community College (CC) students to serve the needs of farmers and gardeners in its community. A tenet of place-based learning is to enhance learning outcomes by incorporating issues that are relevant locally. Seed production and distribution addresses food, health and sustainability issues vital to Leeward CC's community. Hawaii imports 85% of its food and most of its crop seeds. There is strong demand for crop seeds adapted to local conditions and selected for nutrition, vigor and resistance to drought and disease. The Leeward CC Seed Share is an on-campus collaboration between the Library and agriculture program to propagate, process, label, and circulate a collection of free seeds for student, staff, faculty, farmers and community patrons. This partnership will be used as a case study in place-based education, which shows a way to make the connection between the classroom and the surrounding community. Students receive training through curricula on seed physiology, anatomy, processing and cleaning. A strong research component identifies locally adapted crop varieties, and is carried out in collaboration with local farmers, researchers and non-profit organizations. This partnership enables our campus community to grow food locally, promotes a more sustainable local food system, provides seed processing services to governmental and non-governmental partners, and offers undergraduate research and professional opportunities on seed production, plant breeding and variety trials.

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Increase Industry Involvement in Dynamic Engineering Education

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Engineering education presents unique challenges because technology is constantly changing and new tools and methods are frequently introduced, and industry is the driving force for these changes. A new graduate is expected to be familiar with the latest developments in the industry, however, it is not always practical for instructors alone to incorporate these concepts in their courses. This paper introduces a dynamic teaching method that includes industry elements in the teaching cycle. Some of the most important technology companies, such as Intel, AMD, Google, Dell, Samsung, Freescale, TI, and NASA, could be a valuable resource to introduce current tools and industry trends. Partnering with these companies offers students a glimpse into the latest technology and tools to prepare them for the workforce, and it offers these companies an opportunity to train talented students while they are taking classes. This study focuses on industry involvement by applying internships, workshops, and collaborative projects to engineering education. After including these in the curriculum, there is an increase in classroom attendance, retention, and in student grades. These methods can be implemented in part or in full, depending on the school's needs.

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Connecting Students to Hawaiian Culture through Alaskan Ethnobotany

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For the past three summers, one Native Hawaiian student from the University of Hawaii Maui College (UHMC) has attended an Introduction to Ethnobotany course at the University of Alaska Fairbanks Kuskokwim campus. This course chooses different locations in Alaska to highlight various environments and plant uses across the State. One student each attended the course in their respective summers in the following locations; Kotzebue, Sitka, and Scammon Bay, Alaska. The Alaska EBOT course has a greater emphasis on botany compared to the comparable course, BOT 150 Hawaiian Ethnobotany at UHMC which is a Social Science course. Students reported that they increased their knowledge of plant taxonomy by taking EBOT 101 as compared to BOT 105 They also garnered a knowledge of a broader range of uses of plants by indigenous people. However, the most striking theme of each of these student's experience was a deepening of their connection with their own culture. Their interactions with other indigenous people, a different indigenous culture, and the elders of those cultures awakened a greater realization that they themselves needed to perpetuate cultural practices. As one student said... "don't just say it, live it." Although these students did learn more about botany, they really learned to appreciate and nurture their own cultural traditions.

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Evolution of a Summer Enrichment Program in Agriculture for High School Students

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Many college programs use enrichment or bridge programs to recruit new students. Successes and challenges are being shared from the delivery of a one-week summer enrichment program (2011-2015) for rising high school juniors and seniors by the Department of Agriculture at Virginia State University (VSU). The program began as a day-only program for local students, evolving to an in-residence program that draws students from different parts of the state. The program is intended to encourage students to pursue a college education, to pursue studies in a STEAM-related discipline leading to a successful career in the sciences, and to consider undergraduate studies in VSU's Agriculture program. Through a mixture of lectures, labs, other hands-on activities, and field trips, the program exposes participants to the various academic concentrations available in the department, including animal science, aquatic science, plant and soil science, and environmental science. Each year the program is evaluated by

participants and personnel involved to improve program content and delivery. Participants gain a broader view of the disciplines and careers within agriculture. Challenges have included keeping students engaged and motivated while exposing them to a wide range of information and activities in 4.5 days, especially when some are most interested in the activities they consider to be fun. A number of participants have enrolled in the department after completing high school, although several have either left the department or left VSU. After careful consideration, the scope of the 2016 program will be narrowed to focus on plant, soil and environmental science.

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Cultivating Student Success through Diverse Experiences

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For many students, the university setting is the first time they truly experience diversity. However, even with a multitude of opportunities, students commonly choose to stay within the norm and often do not experience the diverse opportunities available on campus or in the community. In many classes, a diversity assignment can be easily incorporated to reinforce content knowledge that also emphasizes diversity. Within the (department) at (university), diversity assignments have been embedded into several courses. For example, in the departmental introductory course, students are required to select a diversity activity and gain instructor approval. As part of the assignment, students are to provide a reflection on the experience. An analysis of these reflections revealed important perspectives on the value of the experience. An African-American student attended a seminar on misrepresentation of Asian Americans and Asian Internationals in America. In her reflection she stated "I never considered Asian Americans as people of color so I always looked at them as differently than me." A first generation Egyptian American attended a barbeque with her "Southern Belle" roommate, and found this assignment impacted her acceptance and perception of the southern culture. Another student who classifies himself as a country boy attended a cultural dinner at a local Indian restaurant. He stated this experience was extremely out of his comfort zone, but one that

made him appreciate and gain an understanding of an unfamiliar culture. Through these assignments, students cultivate new learning about diversity.

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Poster Presentations: Combining Communication, Research and Creative Skills for Undergraduate Students

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Conference poster sessions allow students and professionals to showcase innovative learning strategies and research studies. These sessions teach valuable career skills that emphasize the communication of knowledge, creativity, presentation methods, and many other needed career skills. In the "Presentations in Agricultural Organizations" class, students must prepare and present eight different presentations. For one of the presentations, students are partnered up and must select an agricultural topic to research. After several class sessions on poster design, research methods, and communicating through posters, students design and participate in a mock poster session. Professors and other university faculty judge posters in a similar set-up as those poster sessions at conferences. The rubrics used contain sections devoted to poster design, communication of poster, and presenter knowledge. Posters are scored and winners are announced following the poster session. This teaching strategy is a class highlight for the students according to evaluations. Students take pride in displaying their hard work and appreciate the university faculty taking the time to interview them about their topic. Former graduates explain that this assignment helped them in their careers and graduate school. Collaboration, a beneficial career skill, is needed for the poster design and research component. To gain full credit, both presenters must communicate the message in addition to designing the poster. After the judges have finished evaluating the posters and presenters, students then share their posters with classmates and complete a reflection. These posters are displayed in the hall for the rest of the semester for others to see.

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Engaging Students through Various Teaching Methods: Experiences from an Introductory Tropical Ornamental Horticulture Course for Non-Majors

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Keeping students engaged in class is a key component for maximizing learning. Getting students interested can be a challenge, especially if a class is mostly composed of non-major students. To increase student engagement, teaching approaches need to be diversified. In Spring 2015, various teaching methods (i.e. Prezi, Powerpoint, guest lectures, film showing, archived lectures, group work, live plant samples, student presentations and hands-on activities) were used in TPSS 120E (Plants for People: Ornamentals), an introductory class in tropical ornamental horticulture for non-major students (15 students total, with 11 non-majors and 4 majors). Short surveys administered before and after the class (N=10, 80% non-majors) and the university administered Course and Faculty Evaluations (eCAFE) (N=13, 75% non-majors) were used to collect data on student learning and to identify helpful or enjoyable class activities. Results of the pre-class and post class surveys indicated that students increased their knowledge of tropical ornamental plants. Sixty percent of the students (N=10) were able to name more than 10 plants that were learned from class, while 40% were able to name less than 10 plants. All students identified the hands-on activities as the most enjoyable part of the course. Other approaches that students found useful were guest lectures and video recordings of the lectures. Majority (80%) also indicated that the class met their expectations and all (100%) said that they would recommend it to their peers. Based on these results, more hands-on activities will be incorporated into the course to increase engagement and learning.

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Successes and Failures: Academic/Graduation Results Over Time for Developmental Students Enrolled in a Small State University Agriculture Program

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Student recruitment, retention, and graduation are major topics of discussion in evaluations of institutional success. Remediation requirements of first semester freshmen have been identified as major factors limiting success. Many universities have chosen to apply increasingly stringent requirements on incoming freshmen to reduce necessary remediation. Others implement programs for assisting at-risk students to help them overcome identified deficiencies and move on schedule through their chosen program. Incoming freshmen students for a small, state university undergraduate agriculture degree program were screened over a ten-year period to identify the annual cohort requiring one or more developmental course as a percentage of total entering agriculture freshmen. Students were identified deficient based on ACT exam scores or equivalent entrance exams. Grades in developmental course(s) were compiled along with cumulative grade point average, credit hours earned, and final outcomes, i.e. graduation, transfer, or continuing. Additional student costs associated with developmental courses were estimated by prevailing tuition/fee charges. Correlations were calculated between extent of developmental work required and student outcomes. Findings showed that success rate was low for students entering secondary education with required development courses. Degree of success was found to vary greatly by student. Student costs associated with developmental programs were substantial. A better understanding of the extent of developmental deficiencies and probabilities for success through developmental courses should benefit university administrators of agriculture degree programs. Developing successful strategies to address this issue may provide cost savings for individual students and enable more efficient utilization of limited resources.

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Creating Infographics as an Educational Teaching Tool in Two Iowa State University Animal Science Classes

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Infographics or informational graphics are visual images used to represent information or data that allow the author to concisely and quickly communicate to the reader. An infographic assignment was created in two sophomore-level animal science courses: equine science and a required current issues in animal science course; as a creative way for students to present knowledge gain. The objectives of the infographic assignment are to identify and research a topic, create effective, concise and compelling message points and creatively present information in a visually pleasing manner. The infographic must include a heading, at least three sections or message points, graphic elements such as charts, graphs or photos and citations. Equine science students created an infographic about a career in the equine industry while students enrolled in the current issues class focused on a concern facing animal science, ranging from breed specific legislation or raw milk consumption to use of animals in research. Evaluation data collected from both courses over the course of four semesters indicates that students feel the infographic assignment has contributed to their overall knowledge gain. Additionally, students indicated that they improved their skills in the areas of research, graphic design, summarizing and citing sources. Approximately 500 total students are enrolled in these courses each year. One equine science student stated, "I had a lot of fun making it. I felt like it did help me grow in summarization and then implementing that summarization."

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Innovations for Improving Writing Skills of First-Year Students in the Agricultural Technology Program at Virginia Tech

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Potential employers of the graduates of the two-year Agricultural Technology Program have repeatedly emphasized the need for excellent communication skills by our graduates whom they intend to employ. Therefore, the program emphasizes written and oral communication skills development in several courses, particularly in the Communications Skills course, which students are required to take in their first semester. Because a two-year curriculum limits the number of courses students can take, this course combines a writing course with a public speaking course, meaning that time spent on any one area of emphasis must be concentrated and highly effective. As the instructor of the course since 2007, I have observed a consistent lack of knowledge of proper written grammar by a large percentage of first-year students. As a result, students' initial attempts at college-level writing are inadequate far too often. Therefore, I have developed a series of four grammar modules which I teach over an intensive four-week period. The modules consist of a combination of online grammar tutorials; published worksheets; and other exercises, practices, and assignments that I created. Each module is a particular aspect of grammar and contains four to six subtopic areas, each of which has its own online component and additional written practices. Pre and post assessments for the past seven years show consistent and substantial improvement in student performance. Pre-test averages are in the low 60's with post-test averages in the mid 80's, moving the typical student from a D level of ability to a B.

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Impacts of Mediasite Classroom Capture on Attendance and Final Grades in the Freshmen Course Introduction to Companion Animals

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Technologies that make course instruction more efficient are thought to benefit student learning outcomes. However, learning outcomes may decline if the technology is not used effectively. Introduction to Companion Animals (ANS 105) is intended for freshman students and was taught Fall and Spring semesters by the same instructor, in the same room, at the same time, in the same delivery format from Fall 2006 to Spring 2015. The

first eight semesters were prior to implementation of Mediasite online classroom capture recording software (n=977 students) and the following eight semesters were after implementation (n=1005 students). Attendance was monitored and used for a portion of the grade (maximum of 40 out of 570 points or 7% of the grade). Students were divided into attendance point groups: those that missed ≤ 3 days received 40 attendance points (Perfect), those that missed between 4 and 7 days received between 30 and 10 points (Mid); and those that missed 8 or more classes received 0 points (Poor). Students with Perfect attendance had higher final course grades with Mediasite (89.7% (n=729) vs 88.7% (n=651), P=0.045). In contrast, Mid attendance students tended to have lower final course grades with Mediasite (81.3% (n=158) vs 83.1% (n=174); P=0.088). Poor attendance students had lower final grades (66.8% (n=118) vs 73.8% (n=152); P<0.001) and missed more days with Mediasite (13.7 vs 12.3; P<0.001). Results indicate that Mediasite recordings benefitted top performing students that normally attend class while decreasing grades and attendance for students that miss class 4 or more days.

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Improving the Delivery and Content of an Online Plant Science Lab Course by Assessing Learning Outcomes

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Assessing the learning outcomes of an online plant science lab course was use to enhance the delivery of a lab course. The course is delivered using Moodle as the Course Management System (CMS). Over the past eight years, "Introduction to Plant Science" evolved from being offered face-to-face, to being fully on-line, including the lab activities. Students, at home, conduct the lab activities using a commercial lab kit, which is integrated with other course activities. The lab kit includes small quantities of chemicals, potting mix, lab glassware, and an electronic balance. Three types of direct assessment using pre/post-test quizzes and a rubric for the lab reports. Also, indirect assessment was done using pre/post surveys of student self-assessment of their learning gains (SALG). Though using these tools, the

course content and delivery was modified. Topics relating to genetics were consistently low scoring on pre and post quizzes. The lab activities were modified to include more labs relating to genetics topics. The SALG survey also showed that while there was a preference, at the start of the class, for fully online, the survey at the end of the semester had a high preference for a weekly face-to-face lab session. The course is now offered with a choice of sections with one fully online and the other face-to-face. Additional software tools are now use to develop modules with increased student activities.

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Campus CSA and Farm Market: Tools for Teaching Crop Production and Developing New Farmers

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AG 251 Sustainable Crop Production I is a requirement for students in the Sustainable Tropical Crop Management Associate degree at University of Hawaii Maui College. This course emphasizes hands-on teaching with the outcome of students producing a commercial crop. The course shifted from producing 1-3 crops for wholesale to the current model of a small scale market garden that produces a wide variety of vegetables and flowers to sell at a farm market and a subscription based CSA bag on campus. This shift is intended to illustrate high value production that could be viable on small acreages common in Hawaii that a new farmer might be able to access. By growing a wide range of crops and varieties, students practice numerous planting, cultural, harvest and post-harvest techniques. Food safety is emphasized. They market directly to the customer and receive feedback on consumer preferences. By semester's end the instructor attempts to build teams that can become self-directed. Successful outcomes include a broadening of knowledge of potential crops in Hawaii's markets, hands-on skills in actual crop production, and direct marketing. In the second semester, students are expected to be mostly independent in production processes and focus on learning more about business aspects such as cost of production. Challenges that need to be addressed with this

style of production is improving students' understanding of crop scheduling and farm planning in the following semester to meet these marketing needs.

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Exploring Innovation with Online Delivery Methods: A Blended Approach

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Colleges of Agriculture are called to meet the needs of students seeking non-traditional access to education. In order to do so, educators have had to learn how to design student-centered instruction in an online format. Most distance education occurs either synchronously (real-time online learning through video conferencing/chat) or asynchronously (students work on their own time and pace). However, there are benefits and drawbacks to both methods. In an attempt to create a unique learning experience, a blended approach was developed to teach an online evaluation and accountability graduate course. The course had been previously developed and taught asynchronously. This approach best suited those students who were at a distance. However, recently this course encompassed both on-campus and distance students with the former expressing the desire to learn the material in-person. As a result, the instructor developed a blended synchronous and asynchronous delivery method. The purpose of this presentation is to describe one practitioner's experience teaching an online course through a blended approach. As a case study, the practitioner presents her participant observations and reflections from the experience, as well as student reflections from the experience. A few results are presented here: significant differences during the synchronous discussions with on-campus students and those held with the distance students; the majority of students appreciated the opportunity to "meet" online or in person for one hour per week. Understanding student perceptions of this blended approach can help practitioners to innovate and create online courses to meet the needs of their diverse learners.

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Predictors of Career Decision-Making Self-Efficacy Among Female College Freshmen and Transfer Students

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Career choice studies, especially as it relates to students enrolled in colleges of agriculture, have focused primarily on influences of individuals (e.g., family, friends, teachers) and educational experiences (e.g., enrollment in FFA or 4-H). What has been less often studied are the perspectives of female college students regarding their career decision-making abilities and other salient educational and career-related outcomes. The purpose of this descriptive exploratory study was to extend college choice research by testing elements of the satisfaction model of Social Cognitive Career Theory (SCCT). Data were analyzed for a subset of students who were enrolled in a freshman introductory seminar course. Incoming female freshman and transfer students (N=309) responded to survey questions eliciting information related to various demographic characteristics, affective states and expected career outcomes. A predictive model revealed that career decision self-efficacy is significantly predicted by expected career performance, expected career satisfaction, and perceived major fit. This study contributes to our understanding of the link between female college students' ability to make career decisions, affective states and fit within an academic major. More importantly, the findings highlight information that can be used by colleges of agriculture to better address the academic and career development needs of female students.

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Forensic Laboratory and Active Learning Assignments Expose Minority and First Generation Students to Agricultural Programs

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Historically, Purdue has experienced low numbers of minority and first generation students enrolled in College of Agriculture programs. For example, 2013 College of Agriculture enrollment data showed 6.8% minority and 1.2% first generation students. The Forensic Science minor, housed in the Department of Entomology, stands in contrast to this trend with much higher minority (14.9%) and first generation (24.6%) student enrollment for the same year. Interest in Forensic Science is potentially an ideal way to attract new student populations into agricultural programs, but the popular understanding of forensic science has little overlap with agricultural areas. By taking a wide definition of forensic science as any scientific endeavor that intersects with the law (either criminal, civil, or regulatory), our program can expose students to agricultural problems outside the popular scope of forensic science. Even with this broader scope, existing course material is lacking that exposes students to "forensic agriculture." In this presentation I detail various laboratory and active learning exercises in the fields of Entomology, Agronomy, and Forestry and Natural Resources we have developed in the past year that expose students to agricultural programs while they learn about forensic science in a process-oriented setting that facilitates interdisciplinary and problem-based learning.

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Factors Impacting Student Situational Interest in an Equine Science Learning Module

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Adaptable E-learning techniques have been shown to improve learner experience. This study explored the factors impacting student interest in two online learning modules. Specifically, situational interest, or interest generated by specific conditions outside of personal disposition. The hypothesis that a choice driven, adaptive pathway would increase Situational Interest guided the research. Participants were undergraduates in an upper level horse management course. Participants were divided in two groups, with half the class completing a choice driven adaptive design module (Groups LP1 and LP2) and the remaining

students completing a teacher driven, linear design module (Group LN1 and LN2) in a Latin Square 2x2 design. Students completed a 42 question Likert-Scale questionnaire measuring personal and situational interest. Situational Interest was divided into 5 subgroups: Class Interest, Teacher Interest, Group Work Interest, Online Learning Interest, and Learning Pathway interest. Personal interest was measured through Subject Matter Interest, or the students' pre-existing topic interest. Results were analyzed using ANOVA and Pearson's correlations. Results revealed no significant difference in Situational Interest in Group LP treatments. There was significant difference in Class Interest related to Personal Interest in all groups (LP1, p=0.009; LN1, p=0.013; LN2, p=0.008; LP2, p=0.019). Class Interest, Online Learning Interest and Learning Pathway interest all impacted the attitude toward online interest for students in the linear pathway. This study revealed a multi-factorial impact on Situational interest in an online module outside of the original learning pathway focus. In conclusion, there are many factors to consider when designing and developing online curriculum for students.

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CEEZAD BSL-3 Training/Transboundary Animal Disease Summer Program

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The Center of Excellence for Emerging and Zoonotic Animal Diseases (CEEZAD) offered a new BSL-3 Training/ Transboundary Animal Diseases Program in 2015 to graduate students and DVM students interested in research and careers in this field. The goals of the two-week program were 1) to provide training on essential practices to safely conduct research in a BSL-3 and BSL-3 Ag setting and 2) to provide current practical and scientific information on select high consequence transboundary animal diseases. The first week of the program consisted of hands-on and classroom training at the Biosecurity Research Institute (BRI). The second week included field visits to industry partners in the Kansas City Animal Health Corridor and seminars and lectures from national and international academic and government experts. Five PhD, one dual-degree (DVM/PhD) and three DVM students from seven

different universities were selected for the program following competitive review of applications. A post-program survey prepared in collaboration with the KSU Office of Educational Innovation and Evaluation was completed by all nine participants. Activities were rated on a 4-point Likert Scale (4 = very important/excellent). Topics covered during the first week were rated "very important" by a majority of respondents (range 3.44 to 3.89). Week two presentations received scores ranging from 2.5 to 3.88. Students reported BSL-3 training and networking to be the most beneficial aspects of the program. Feedback from the survey is being incorporated into planning for the 2016 program.

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Learning Management Systems to Improve Online Access for Students of the College of Agricultural Sciences-University of Puerto Rico-Mayaguez

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Learning management systems (LMS) are largely utilized in the US but still in the College of Agricultural Sciences of the University of Puerto Rico most courses lack online content and are taught traditionally (face to face). Online access to courses has been documented to improve learning skills of students and that some activities are more convenient in this manner. The lack of knowledge in LMS might prevent our faculty to utilize them. Therefore, six workshops were prepared to train faculty in the utilization of Moodle (current LMS of our institution). A laptop computer was offered to each person to encourage training participation. Faculty were requested to present their hybrid courses at the end of the training. A survey was also given to address the participants' satisfaction. Eighteen faculty members (ten and eight for year 1 and 2, respectively) were trained. A total of 32 courses, in Animal, Food, and Soil Sciences, Crop Protection, Agricultural Economics, Agronomy and Horticulture were prepared on Moodle. The majority of faculty prepared one course but five prepared up to four courses with online content. On a scale of 1 (completely disagree) to 5 (completely agree), the average score for topics being new and innovative to the participants was 4.8. Moreover, for the likelihood to incorporate LMS into their courses, the average score was 4.7. The total number of undergraduate students estimated that will be impacted by training these faculty is 520 each year. In the near future, additional faculty from our college will be trained.

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Comparison of Classroom and Field Learning Environments: A Look at Student Learning and Enjoyment

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Practicing agronomists spend large amounts of time in the field during the growing season. A profession that includes being outdoors is what draws many people to agronomy, but, for many reasons, agronomy is mostly taught indoors. The Agronomy 212 Lab, Field Application and Problem Solving in Crop Production at Iowa State University has historically been taught indoors. The objectives of the research were to 1) determine if there is a difference in learning between environments (classroom and field) and 2) determine whether students enjoyed learning more in a particular environment. One, two-week unit was chosen for the comparison. During the fall semester, all five sections of the lab were able to study in the field during the corn growth, development, and management unit. The next semester, the same material was examined by all five sections, but in the classroom. A pre-unit quiz and survey were given, along with a post-unit quiz. The survey results were compared to determine students' overall enjoyment of the lab both before and after the unit. The quizzes were used to determine how much students' knowledge increased from the beginning to the end of the unit. Quiz results showed students did similarly across all topics of the unit both semesters. Students also responded to the survey by expressing a slight increase in overall enjoyment of the lab when comparing the pre-survey and post-survey over both semesters. Overall, there was not a significant difference in overall course satisfaction between the classroom and field version of the lab.

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Hort Plants: An iOS App for Teaching about Landscape Plants

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The use of mobile devices (smart phones or tablet computers) is increasing among college students and agricultural professionals. Studies indicate that college students and agricultural professionals are increasingly relying on these devices for accessing information of their interest. Request for interactively searching landscape plants based on specific cultural needs has also been increasing from diverse audience comprising of homeowners, Master Gardeners, students and horticulture professionals. The Hort Plants app was developed to address this need and features cultural and plant specific recommendations for 276 plants using 931 high-quality images and 18 searchable categories. The app uses advanced image compression techniques to significantly shrink images without compromising visual quality. Once installed on an appropriate device the user is not required to use their data plan for further interactions. Several thousand users have downloaded it and provided feedback about its usefulness. It has also been used for teaching plant materials to Green Industry professionals preparing to take the "Arkansas Certified Nursery & Landscape Professional" certification and for Master Gardener basic training in Arkansas. Having proved itself as a 24/7 available, on-the-go, pocket resource, it has potential to be adopted for in-class room instructions. The poster will provide design philosophy, details concerning data base creation, layout of the program and user feedback about the applicability of the program.

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Using the Undergraduate Research Course as a Tool to Develop Scientific Proficiency in the University of Puerto Rico - Aguadilla

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The development of leadership, critical thinking, and teamwork skills is essential for student success in graduate schools and the job market. Undergraduate research plays a key role developing these skills. UPR-Aguadilla is a small size institution of about 3,000 students. The undergraduate research is a required course for graduation in the Department of Natural Sciences of UPR-Aguadilla. Students enrolled in the course have opportunity to improve scientific techniques, design experiments, analyze and present scientific data. Twenty-one of the students enrolled in the course with 5 faculty members took a survey to evaluate the student perception. A Likert scale was used to quantify the results. Over 90% of the students agreed that the undergraduate research course improved their problem solving, oral/written communications, critical thinking, leadership, time management skills, and workforce preparedness. Moreover, 95% of the students agreed that the mentor provided constant guidance, materials/equipment and help them solve research problems. Ninety-one percent considered the mentor's guidance to be essential for the success of the investigation. The course helped 91% of the students to define their career path. However, 33% of the students identified the space and the equipment to be a limiting factor that needs to be improved. This study provides information about the impact of the undergraduate research course in UPR-Aguadilla's students. Furthermore, this study identifies some challenges that the course is facing. The undergraduate research experience is helping to develop leaders and forming scientist that will enter into graduate programs and compete in the global market.

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Technology Evolution: The Incorporation of ZipGrade into Your Technology Toolbox

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There are many benefits of using modern technology in the classroom. As instructors, we each have expectations of how a particular technology can be used and the benefits incurred from its use. Technologies deemed to be beneficial in the

classroom have several factors in common: demonstrated cost-effectiveness, usability, and reliability. In the fall of 2014, the ZipGrade app was incorporated to obtain data for a multi-year study involving students enrolled in the Introduction to Animal Science course at OSU and this past year, at SEMO. The ZipGrade app allowed the iPad to be used as a functional, reliable, and economical optical grading instrument. Class sizes ranging from 25 to 385 students and response sheets ranging from 20 to 100 questions have been utilized. The ZipGrade response sheet, downloadable at no cost, can be photocopied with or without a student ID and assignment ID. ZipGrade is designed to scan, grade, and review with or without availability to the internet; however, with an internet connection ZipGrade synchronizes all scanned assessments to a secure server. Students can be returned an exact image of their originally submitted response sheet with information regarding missed questions, class average, and final score. For each question, the percent of students answering a question correctly and the discriminant factor, which allows for a closer interpretation of the question, is also calculated. Scan rates of one response sheet every three seconds are possible. To date, the authors have reliably and economically scanned over 10,250 assessments and surveys using the ZipGrade system.

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Maximizing Language Learning Abroad: Exploring The Case of the Agricultural Spanish Program at The Adventure Education Center in Turrialba, Costa Rica

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Due to an increasingly diverse population in the United States, language acquisition and intercultural competency is of utmost importance, especially for those pursuing careers in the agricultural industry. An exciting option for agricultural educators and students to enhance these skills is to participate in immersive international learning experiences. This undergraduate student research, conducted as an opportunity for engaged scholarship, explored the key characteristics of immersion experiences designed to enhance Spanish language acquisition specifically in the discipline of agriculture. Collaborating with the Adventure Education Center (AEC) Spanish institute in Turrialba, Costa Rica, interviews were conducted with program administration, teachers, and participants. This study had the following research objectives: 1) Describe the participant experience of adult learners in the AEC Program; 2) Identify key characteristics of language acquisition in Spanish language courses and co-curricular experiences; and 3) Evaluate current reflection practices to develop models for future implementation through the use of Kolb's experiential learning model, which follows the core tenets of concrete observation, reflective observation, abstract conceptualization and active experimentation. Primary qualitative data collection was complemented by autoethnographic reflection of the researcher's personal, academic, cultural and immersion experience at AEC. Preliminary results indicate a strong correlation between language and cultural learning, facilitated through host family stays, interactions with native speakers, and participation in agricultural activities. A stronger connection between classroom learning and hands-on learning could maximize the potential for language learning. Improvement of the relationship between reflection facilitators and participants would also increase the benefits of the international experience.

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Innovative Scholarly Approaches to Train Minority Students in Research on Spatial and Temporal Patterns at the Chesapeake and Hilo Bays

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The innovative teaching approach of this presentation is a unique combination of training Minority undergraduate students at the 1890 Land Grant Universities, Virginia State University (VSU) and Delaware State University (DSU) for their academic advancement by engaging them in experiential learning during the academic year at their

home institutions (VSU and DSU) and summer at the 1862 Land Grant University, University of Hawai'i at Hilo (UHH). The focus of the student research was on spatial and temporal patterns at the Chesapeake Bay (eastern coast) during the academic year at the home institutions and Hilo Bay (pacific coast) in Hilo in summer 2015. Students were trained in water quality monitoring and studied phytoplankton community composition at the study sites. The students collected data on geographical locations of the study sites with GPS and mapped the study sites with ArcGIS. Measurements were taken on the secchi depth, turbidity, salinity. percent dissolved oxygen, temperature, and nutrients. The methodology included collection of water samples at a buoy positioned one meter from the shore of Hilo Bay and preserving the phytoplankton, concentrating and dehydrating the sample, and viewing the phytoplankton with a Hitachi S-3400NII scanning electron microscope (SEM). The scholarly research approach engaged students in research during academic year and summer internship which included training in the use of ArcMap and SEM for interpretation of spatial and temporal patterns. The studies were supported by the NIFA CBG 2013-04008 and NSF HBCU 1036286.

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Strengthening Student Engagement and Campus Collaboration through Community Connections in Hawaii

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Hawaii is a diverse state with a strong cultural connection to the host culture and the many ethnicities that make up the population. Many underrepresented minorities make up the majority of college campuses demographics. Educators in different campuses in the University of Hawaii (UH) System: Leeward Community College, Maui College, Kauai Community College and UH Hilo use connection to place and culture as a way to spike interest in agricultural sciences. As a component of the place-based learning and experiential curriculum, a milpa field experiment was conducted in each campus/college. The Milpa is a traditional indigenous agricultural system that has been developed and used in the Americas for

thousands of years. We chose this system because it connects agricultural practices with culture and history, which is a useful tool to engage our student population. We developed a field experiment where a local variety of corn was intercropped with squash and five varieties of beans. While each campus used the same methodology for the field experiment, individual campuses used additional methodologies (e.g. Rhizobium nodules identification, ethnobotanical skills and value-added processing) to accomplish the student learning objectives of its classes and as a way to engage their specific student audience. Here we will present the results of this inter-campus collaboration and the impacts this type of project have on student learning. This approach may be used outside Hawaii to capture the interest of underrepresented minorities and non-traditional students in the agricultural field.

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Teaching Sustainable Gardening by Modeling a Family-Sustaining System

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This poster presents the details of a demonstration project in which the author built and lived from a small set of hydroponic and soil gardens on the decks of her family home in urban Honolulu and taught families how to do so, in a weekly sustainability program. The author designed the gardens to cover the daily nutrient needs for two, as recommended by the USDA. She built three, 8-bucket, static hydroponic systems to grow lettuce, Swiss chard and bok choi. She built 8, deepwater hydroponic systems, using 38-gallon bins to grow: tomatoes, kale, spinach, herbs, and cucumbers. She planted root crops and larger plants in a soil, container garden (carrots, potatoes, beets, turnips, daikon, onions, garlic, ginger, eggplant, kohlrabi, sweet peppers, squash and herbs). She planted sweet potatoes, pigeon peas, dwarf citrus, and cassava as landscape plants in the small yard. Meals were planned to provide USDA recommended vitamins, minerals and nutrients, using recipes from a different region of the world, each week, to provide variety. She lived from the demonstration system for 10 weeks and recorded: 1) construction costs; 2) costs of seeds, seedlings and fertilizer; 3) planting schedule; 4)

productivity of each system; 5) problems and solutions; 6) daily meals, recipes and nutrient analysis; 7) weekly grocery and "food eaten out" costs for one month prior to the demonstration; 8) weekly purchased food costs for 10 weeks of living off the system; 9) weekly health indicators (weight, BMI, body measurements, blood pressure, blood sugar, diabetes status); 10) weekly time spent maintaining the system. Families built hydroponic systems and soil gardens at the family education center and cooked meals from these gardens. Parent and youth questionnaires indicated significant improvements in their: understanding of nutrition and cultural aspects of food; gardening and cooking skills; family cooperation in gardening and cooking at home; and family members' attitudes toward food. A cost-benefit analysis was conducted and described.

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Instructional Strategies for Agricultural Students with Visual Impairments

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This case study focuses on one student with visual impairment enrolled in an equine health and disease class. The class structure involves two lectures each week and one laboratory class. Historically the labs have been very hands on and often involve students watching a veterinary procedure or handling the horses. This case study focuses on efforts made to provide the visually impaired student with the same learning experiences as the other students, with a specific focus on things that could be done better in the future. The student was able to participate in all labs covering a variety of topics, for example body condition scoring, wound treatment, and parasitology. The student also completed hands on tasks including leg wrapping and taking vital signs. Assistive technology that was beneficial under these circumstances is discussed with personal feedback from the student. This example should assist faculty members who have visually impaired students enrolled in animal science classes with a laboratory component.

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A Comparison of Students' Career Aspirations and Decisions Before and After Completion of an Introduction to Agricultural Communications Course

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Students enrolled in an introductory agricultural communications course were given a questionnaire before and after completing the course (N = 91). Students' career decisions, confidence in career choice, as well as students' perceived benefit of learning more about and level of knowledge of agricultural communications jobs/careers were compared. Major had a significant effect on students knowing what job they wanted prior to coming to college (p = 0.04). Agricultural leadership student reported a higher mean (M = 4.73, SD = 1.7) than agricultural communication majors (M = 3.52, SD = 2.0). There was a significant difference in scores for students' perceived knowledge of agricultural communications jobs before (M = 4.15, SD = 1.33) and after (M = 4.83, SD = 1.68) the course t(78) = -4.18, p <0.001). There was no significant difference in the scores of students' career choice confidence before (M = 4.04, SD = 1.60) and after (M = 4.03, SD = 1.58) the course t(77) = 0.07, p = 0.94. Agricultural leadership students in the course came into college knowing what career they want after graduation. Agricultural communications students in the course came into the major not knowing what career they want, and this course did not improve their confidence in their career choice. The course improved students' perceived level of knowledge of jobs/careers in the agricultural industry. This suggests more efforts be spent informing potential agricultural communication students about job/career opportunities. A semester is not sufficient to affect agricultural communication students' career choice confidence.

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Experiential and Experimental Learning Approaches in Agriculture Sciences at Florida International University

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United States Department of Agriculture's NIFA-HSI, MSP, and NNF Programs in Agricultural Sciences at Florida International University, Miami, FL provide innovations in education, research, and outreach activities for outstanding undergraduate students from large Hispanic and African-American with a two-pronged objectives: (a) preparing young undergraduates for pursuing career in scientifically challenging and globally competitive US agriculture industry, and (b) enhancing multicultural diversity in skilled agricultural workforce. Our program students complete a four-year bachelor degree in Environmental Studies with a major in Agriculture Sciences, and undergo rigorous mentoring/training program to help themselves with landing a career or graduate program in agricultural sciences. The academic program focuses on agricultural problems including: (a) on-farm/range land practices and pollution loadings, (b) bio-geo-chemical processes and nutrient cycling; (c) on-farm and off-farm remediation measures, (d) surface and ground water management (e) loss of agriculture land and water to urban sprawl, (f) promotion of a community-supported agriculture. The courses and experiential and experimental research activities train students in cutting-edge lab and field techniques: geospatial mapping and analysis, soil and ecosystem nutrient cycle analysis, bioremediation techniques, organic farming and economic cost-benefit analysis. These students at our program gaining competitive edge in pursuing agriculture careers that require multi-disciplinary skills and perspectives. As part of the curricular requirements, students get summer internship opportunities to work closely with USDA and other local and state agencies. As a result of rigorous training and mentoring process, our students graduate between 4.5 to 5.0 years. We have developed successful pipeline to USDA workforce diversity.

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The Impact of Undergraduate Students' Perceived Efficacy on Academic Performance in an Animal Nutrition Course

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The California College of Agriculture has experienced dramatic growth over recent years, including a shift in student demographics. Previously comprised of primarily rural students, current demographics include students from urban backgrounds. Similar to colleges of agriculture across the nation, enrollment growth created a need for courses that can efficiently deliver content, promote student learning, and engage changing student populations. Knowing research supports academic efficacy as a predictor of student success and academic performance in universities, the objective of this study was to observe the relationship between students' perceived efficacy in key skills related to animal feeding and academic performance in a redesigned course. The Animal Feeds and Nutrition course (ANSC 230) addressed key concepts in feeding (digestive systems; feed classes; basic formulations) and species-specific case studies. The redesigned course included Facebook office hours, reflection time, and case studies. The course utilized these tools to promote engagement, evaluate student performance, and assess confidence in course content. Students (n= 47) were assessed through a researcher-developed instrument, total points earned, and course assignments (i.e. exams; case studies) to determine if student comprehension was impacted by efficacy. Post-survey scores (3.7332 ± 0.736) were higher than pre-survey scores (2.3012 ± 0.736; $P<0.001$). Additionally, perceived efficacy differences and total course points were positively correlated ($P=0.024$). However, a correlation was not observed between efficacy and individual course assignments such as case studies or exams ($P>0.05$). The redesigned course also led to increased student confidence, which was correlated to total points achieved in the course.

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Examining the Differences in Learning Style Preferences for College of Agriculture Students

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Understanding student learning preferences plays a large role in designing and delivering effective instruction. This descriptive study was part of a larger examination of senior College of Agriculture students. Students (n = 210) were enrolled in capstone courses in three majors from 2014-2015. This portion of the study included assessment of student preferences for Kolb's four learning modes of experiential learning theory: concrete experience, reflective observation, abstract conceptualization, and active experimentation, using Kolb's Learning Style Inventory (KLSI) v. 3.2. Instrument scoring allowed for scores ranging from 12-48 for each of the learning modes. Results revealed preferences for active experimentation (M = 33, sd = 8.7) and abstract conceptualization (M = 32, sd = 8.2) over the modes of concrete experience (M = 27, sd = 6.9) and reflective observation (M = 28, sd = 6.6). Preferences for grasping and transforming information highlighted that, as a group, students preferred to grasp information through apprehension over comprehension and preferred to transform information via extension of thinking rather than intention. A one-way ANOVA yielded no significant differences between majors. There are far-reaching implications of these results for developing instruction and delivering information. Delivering information in a method most closely related to student preferences has the potential to increase student understanding, especially for abstract concepts. The conclusions of this study help to provide insight for a prescriptive approach to teaching, learning, and advising.

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Impact of Course Delivery Method (Online vs Traditional) and Semester (Fall vs Spring) on Final Grades in a Freshman Animal Science Course over a Six Year Period

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Introduction to Companion Animals (ANS 105) is a course intended for freshmen students. Anecdotal evidence suggests that online students have lower final grades than traditional classroom students. ANS 105 is taught four times most years by the same instructor with very similar content and grading rubrics. The summer course is a 5-week online course and one Fall offering is online over the standard 15-week period. ANS 105 is also offered as a traditional classroom course in the Fall and Spring. To determine if online delivery, duration period or traditional semester offering affected final grades, courses from 2009 to 2015 were analyzed (6 summer online courses, 6 Fall online courses, 7 Spring traditional courses, and 6 Fall traditional courses). Online Summer (81.9%; n=123 students) and Online Fall (82.6%; n=180) final grades were lower (P<0.01) than traditional Fall grades (86.1%; n=774) and traditional Spring grades (85.1%; n=880). In addition, the Spring traditional delivery grades tended to be lower (P=0.08) than the Fall traditional grades. Data suggest that students in this introductory course perform poorer when taking the online version, which may be related to increased personal responsibility and self-motivation that many online courses require. In addition, the student population taking this online course differs widely and their interest and commitment to this specific study concentration may be less than those taking the traditional courses. Interestingly, new Freshmen entering in the Fall semester tend to outperform their Spring counterparts.

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The Softer Side of STEM: Agricultural Sciences Students' Perception of the Role of "Soft Skills" in their Educational and Career Success

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Reports show that the ability of new graduates to obtain and maintain a position successfully in industry is a result of their technical knowledge (15%) but more importantly their soft skills (85%). According to a report by APLU, new graduates lack adequate "soft skills" and increasingly colleges and universities are working to identify innovative ways to address this issue. The APLU report resulted in the ranking of the importance of

seven soft skill clusters (communication, decision making-problem solving, self-management, teamwork, professionalism, leadership and experiences) by students, faculty, alumni and employers. The current study seeks to determine agricultural sciences students' perception of the importance of the individual soft skills within each cluster and the students' likeliness to pursue opportunities to obtain additional soft skill training. To address this objective, 118 agricultural sciences students at Tuskegee University were surveyed. The results indicated that the most important soft skill was punctuality and meeting deadlines (4.8/5.0) and the lowest (4.0/5.0) was international experience (1=Not Important, 2=A Little Important, 3=Important, 4=Somewhat Important, and 5=Very Important). Interestingly students indicated that they had not strongly considered the impact of the soft skills their educational or career success prior to this survey 3.25/5.0; however, only 2.98/5.0 indicated that they were likely to pursue opportunities to better develop these skills following the survey (1=Strongly Disagree, 3=Agree and 5=Strongly Disagree). In conclusion, these findings indicate that students in agricultural sciences are aware of the importance of soft skills; however, they are anxious to pursue opportunities to improve these skills.

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Identifying and Changing Perspectives of Agriculture: A Case Study

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High-Impact Experiences (HIE) are more likely to impact students than traditional educational delivery formats. Undergraduate students (n = 18) in the College of Agriculture and enrolled in a study away course were given the opportunity to experience differing perspectives of agriculture during an eleven-day field experience focused on providing a broad-scale view of agriculture. This case study used qualitative research methods including interviews and content analysis of student reflections to examine the experience of the students and their shifting perspectives of agriculture from the beginning of the class to the end of the semester. The trustworthiness of this case study was guided through careful attention to a research protocol which included provisions for

data collection, coding, and analysis. Data analysis revealed three main emergent themes from students in the course. First, students noted the value of the course design in promoting their personal reflection on agriculture. The second theme was student concern for the differences between modern agricultural practices and consumer knowledge. The third theme revealed through this case study was student acknowledgement of their own naivety related to agricultural industries they had no personal experience with. These findings may help faculty members design meaningful field experiences for students in order to prepare them for careers in industry, and as advocates for agriculture as a whole.

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Comparing Exam Options for Assessment of Student Learning

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Various aspects of student learning can be assessed through different exam formats and conditions. The objective of this study was to compare student performance on initial exams to performance on follow-up exams with different conditions. Two animal science courses taught by the same instructor in 2015 were used for this study, Animal Reproduction (AR) and Horse Science and Industry (HS). The AR course included five short exams, and the HS course included three 50-minute exams. All initial exams were completed individually without notes. Follow-up exams contained the exact same questions as corresponding initial exams. One AR and all three HS follow-up exams were completed individually without notes during the class session following the initial exam, allowing for additional review. The remaining four AR follow-up exams were each given with different conditions during the same class sessions as the initial exams. These conditions included review of notes between exams, open classmate discussion without notes, open notes without classmate discussion, and open notes with open classmate discussion. Overall average scores improved from initial to follow-up exams, increasing from 66.2% to 85.5% in the AR course and from 68.1% to 70.4% in the HS course. Comparing individual scores on follow-up exams to initial exams across both courses, 70.5% were greater, 16.8% were equal,

and 12.6% were lower. Most students demonstrated improved performance on follow-up exams when provided with additional review time or resources. The results also allowed the instructor to gain a better assessment of different aspects of student learning.

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Incorporating Entrepreneurship and Experiential Learning in Agriculture Courses

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In an effort to better prepare undergraduates for the multidisciplinary demands of the entry level management jobs in the agricultural sector, we explored a combination of experiential learning and entrepreneurship as part of our agriculture courses. At the University Agricultural Laboratory at California State University Fresno (FS) in the USA and the Agricultural Innovation Park (AIP) at the University of the West Indies (UWI) in Trinidad and Tobago we implemented hands-on learning experiences. Activities included the installation and troubleshooting of fertigation equipment and irrigation scheduling. In order to teach students the concepts of opportunity recognition, feasibility analysis and developing business models the students were allowed to participate in a series of workshops on the concepts of entrepreneurship for students in non-business classes. Post session surveys indicated that students unanimously found that the field experiences significantly impacted their thinking on the amount of time and labor required to complete various irrigation and fertilizer application related tasks, and overall they developed greater empathy for the challenges that growers encounter on a daily basis. In the case of the entrepreneurship exposure to one of the workshops dealing with the National Organic Program (NOP), more than 90% of the respondents indicated that they had improved their overall knowledge about the challenges and opportunities involved in organic trade. More importantly, they also indicated that they would be willing to enroll in an on-line three-units course on organic farming principles.

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Taking Student Learning Styles in Course Development and Classroom Design

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In order for educators to develop the appropriate course curriculum, assignments, classroom activities, and meaningful outcome assessments, it is important that they understand the differences in their students' learning styles. The impact of classroom design and seating accommodation on visual, auditory, reading/writing and kinesthetic (VARK) learners should be evaluated. The purpose of this study was to determine whether there was any correlation between learning styles and where students sit in the classroom, using selected courses at two universities- The University of the West Indies, Trinidad and Tobago (UWI), and California State University, Fresno (Fresno State). The study mapped the preferred seating by students in the classroom and then recorded where students sat over the semester in courses at different academic levels. A VARK questionnaire was administered and recorded against the student's identification number. Preliminary results indicate that the majority of students have a multimodal preference; most of multimodal students have the kinesthetic (K) learning preference in that they appreciated assignments and learning activities which involved using a hands-on approach and interactive discussion as opposed to straightforward lecturing. In addition, students indicated that if given the preference, they will choose a seat and remain in that position throughout the semester. Generally, students appear to have varied learning styles and thus, teachers should try to meet the learning needs and styles of students. Classrooms should therefore be designed taking into consideration the learning styles of students.

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Students as Co-Producers of Teaching and Education: Role of Service-Learning

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The growing debate about marketization of higher education has remained as a central focus of educational research over the past decade. The vast majority of published research claims that university students see themselves as consumers/customers of higher education rather than knowledge gainers/learners. In our study, we treat the university student as a co-producer of teaching and education through active involvement in community service and service-learning. The whole concept of a student being a consumer of higher education takes entirely new direction when the service-learning component is incorporated into the course syllabus. An actual academic service learning project conducted at the University of Connecticut will be used as an example. The project will target secondary school kids and has a potential to be implemented into middle school curriculum. By participating in real-world service-learning project (e.g., teaching children at a young age about environmental issues and food related issues) university students involuntary become co-producers of teaching and education. A survey will be used to gather data regarding undergraduate students' perception of service-learning through a university-based community project. The survey findings will be used to assess the impact of active community involvement on students' engagement in the classroom and whether the service-learning is seen by students as a valuable tool in consumption of higher education.

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Gaining Farmers' Perspective on Climate Change

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Climate change can be felt through warmer temperatures, increased pests, and more extreme precipitation, with the agriculture sector acutely feeling these impacts. In the Northeast region of the U.S. the agriculture industry brings in over $21 billion dollars in commodity sales, with 21% of the land being farmland, with an additional 62% of the land classified as timberland. Making climate change issues that impact these sectors an issue that needs to be addressed. The USDA Northeast Regional Climate Hub has partnered with Pennsylvania State University and Cornell University to look into the impacts of climate change felt in the agriculture, forestry, and the natural resources sectors in the Northeast. Previous research completed by the USDA Hub, Cornell, and Penn State indicated what the current climate change activities and priorities are of Extension agents, specialists, and researchers across the land-grant universities in the Northeast. Presently, work is now turning to agricultural producers, determining their current perspectives and impacts they are experiencing on climate change. Penn State and Cornell are establishing focus groups interviews with the top commodities in each state, asking producers' their perspectives on climate change and what they are experiencing from changes in traditional weather patterns. Researchers are also using the focus groups to determine the best methods of communication to disseminate climate change information to producers. This presentation will be a brief over view of the research teams' findings from completed data collection. As well preliminary impressions from the local Pennsylvania producers' focus groups and anticipated future direction.

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Teaching Entrepreneurship through Nine Workshops

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Many of our students want to one day create their own company and therefore need to learn some key competencies about entrepreneurship. Through nine workshops, we offer students the opportunity to build a business plan describing their future company. The objective of the presentation is to discuss this successful curriculum, particularly the methods used to teach about entrepreneurship through very short lectures and hands-on workshops. The first workshop introduces students to creativity methods for them to brainstorm on a creative service or product they

could develop and build a company around. The second workshop focuses on helping students understand how to validate their creative idea. Workshop number 3 focuses on marketing tools. Workshop number 4 shows students how to estimate revenues and build their commercial strategy. The fifth workshop proposes student's tools to organize their future companies and perform the key activities. Workshops number 6 and 7 deal with financing the future company and where to find investors. Finally, the last two workshops are there for students to finalize their business plan. These workshops are concluded by a presentation by students of their business plan. This curriculum has been performed for over 5 years and has been strongly improved over this past year with the creation of videos featuring entrepreneurs. New resources have also been developed to assist students further. These improvements have been evaluated by students who have strongly enjoyed the workshops. They feel better prepared to address entrepreneurship in their future professional career armed with concrete tools.

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English as the Instructor's Second Language: A Barrier to the Teaching Learning Process

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Good communication between the teacher and student in the teaching-learning process is paramount. Clarity in the verbal and written communication of lecture material, instructions, and assessment items is an intrinsic variable that every teaching-learning situation should demand. What happens to the communication process when the student and instructor are of different ethnicities and English is the instructor's second language? The problem addressed in this localized study is the exposure of our monoculture students to instructors of another ethnicity and the inherent communication issues that may or may not exist. A case study was conducted for the purpose to determine if the students perceived a communication barrier existed between themselves and the instructor of the class. The students were asked a series of questions to determine which factors contributed to any communication disconnect. This case study involved 18 students that

were enrolled in an agriculture marketing class in the Department of Agriculture at Eastern Kentucky University in the fall semester of 2014. Data were analyzed using descriptive statistics and correlation analyses. The participants perceived there was an apparent communication barrier between the class instructor and the students. The students also reported that there was a high level of anxiety of what they would learn and how the communication barrier would impact their final course grade. The participants reported that their lack of understanding of the class subject was a major contributor to the communication barrier as well. The instructor's agriculture background and teaching preparedness were not factors contributing to the student perceived communication barrier.

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Utilizing the Hardiness Approach in an Undergraduate Leadership Course in Agricultural and Life Sciences

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The Hardiness Approach to Leadership is a particular combination of motivations and skills that extensive research has shown to enhance performance, conduct, morale, and health, which contribute to a person's resiliency. The motivation is contributed by a person's attitudes towards the concepts of commitment, control and challenge. Recent research conducted with agricultural leaders who are considered successful entrepreneurs determined that they all shared a high level of hardiness. Utilizing elements of this research and the Hardiness Approach to Leadership, an undergraduate course was developed to: 1) increase students' levels of hardiness, 2) introduce the ideas of entrepreneurship and hardiness, 3) involve students in "real world" issues impacting agriculture and 4) interact with leaders in developing solutions to these issues. It was the involvement in these issues and interacting with the leaders on developing solutions to these issues that was the true benefit of this course. Students felt empowered, encouraged and resilient in sharing their ideas and solutions. In addition, students completed a survey at the beginning of the course to create a base level understanding of their individual stress levels and ability to use coping mechanisms. They then completed it at the end

of the course, with the majority of students increasing in all three areas of commitment, control and challenge. Students indicated at the end of the course that they would make this course mandatory for all undergraduate students. Future plans include building a certificate program in agricultural entrepreneurship to increase the entrepreneurial mindset of students to meet the future needs of entrepreneurship and innovation in agriculture.

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Recruitment and Retention: Lessons Learned from a Certificate Program

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The Agriculture and Food Studies Certificate program (AG02) at Monroe Community College offers two career pathways; agriculture and food processing. The program is structured for students with at least a high school diploma or GED, as well as some post-secondary education and/or work experience that would allow them to enter the career pathway at a later point (not entry-level). During mid-August 2015, an analysis of admission records indicated that 21 students had applied for acceptance for fall 2015. Eleven (11) had been admitted but only one (1) student had registered for a course. Besides regular communications to apply and register to increase yield, applicants and admitted students also received personal phone calls by department staff and a personal letter from department faculty. Both the phone calls and letters appealed to potential student to either complete the application process and/or register for courses. Each phone call and letter reflected a student's circumstances and provided contact information on how to address financial aid and/or academic issues as well as an offer of personal assistance on advising and registration for courses. Contact information for several local employers was also included in the letter to encourage students to call about local employment opportunities associated with the program. After the outreach, of the eleven (11) students accepted into the program, a total of eight (8) students registered for courses in the program. Students that were not admitted either did not complete the application process or lacked prerequisites for admission.

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Hands-On Learning Contributes to Non-Traditional Student Success in Natural Resources Management and Agriculture

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The Tropical Ecosystem and Agroforestry Management (TEAM) program at Hawaii Community College is a two-year Associate of Science program that prepares students for a career in a wide variety of sustainable agriculture, forestry and ecosystem management fields. We feel that the unique design of the program leads to increased engagement and retention of students. Hawaii CC students come from a wide varieties of backgrounds, most of which are traditionally underrepresented in higher education. Over three-quarters of Hawaii CC students receive Federal financial aid, nearly 60% are female, and only 15% are Caucasian. TEAM classes are unique in that the majority are taught once per week in 6-hour blocks. The design of these classes allows students to approach the material in more detail, allows travel to less-readily accessible field sites and often opens up free days in which students can maintain outside employment. Faculty and outside experts work closely with students in a hands-on learning environment, teaching while students perform tasks and learn related skills. Summer internships are required, and we encourage students to attend relevant conferences and workshops. We find this to be a successful way of engaging non-traditional learners: in a 2013 survey of our graduates 56% had obtained or were working towards a 4-year or higher degree and 68% were employed; 86% of those in a TEAM-related field.

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The Purdue Arboretum's Native Nursery Supports and Extends Experiential Student Learning

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In 2014, the Purdue Arboretum began to expand its mission of collecting and displaying plants native to the Midwest by developing a native plant nursery. By April, ground was broken at Purdue's

Research Farm, allowing the native nursery project to take shape. Today, the student-run nursery is producing 35 different species of plants native to Indiana and is one of the largest on-going projects for the arboretum. The arboretum aims to produce a variety of native plants that will eventually be introduced on Purdue's campus, allowing students and faculty to observe, learn, and appreciate our Indiana natives in the landscape. Through research, teaching, and outreach, we can encourage people to appreciate and find beauty in more sustainable landscapes that express the particularities of a place, its ecosystems and climate. The native nursery initiative also aims to support and extend experiential student learning through active student involvement in the selection, care, maintenance, and research of the plants. This initiative encourages collaboration between faculty and students in the spirit of creating a living laboratory that will enable the campus community to explore the application of sustainability concepts in the campus environment. As example, in 2016, the nursery will be supplying plants for a campus re-development project. Todd's Creek, currently channeled along State Street, the primary road through Purdue University, will be relocated within Purdue's Horticulture Park. Over one hundred native plants, grown and cared for by Purdue students, will be harvested from the arboretum's native nursery and incorporated along the re-located creek.

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Evaluating the Effectiveness of a Pre-Professoriate Program Based on Community of Practice Principals

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Research on Communities of Practice (CoPs) has focused on the participant outcomes; however, there is a scarcity of research on the effective strategies to evaluate a CoP. This provides a challenging context for the researcher conducting an evaluative study of a pre-professoriate program that uses a CoP design framework. In order to address the research gap, the effectiveness of the CoP for the purposes of this study is based on: whether learning outcomes occurred, were the learning outcomes significant in comparison to the financial and human resources, and, are the relationships developed supporting knowledge growth within and without of the the CoP. The pre-professoriate program is designed to train up to six doctoral students representing departments within the college of agriculture and life sciences (CALS) in a three-year cohort group. Students selected for the program express a strong interest in careers as teaching and research professors who are able to utilize contemporary pedagogical strategies. Participants, mentors, advisors and administrators in the college of agriculture were interviewed regarding the pre-Professoriate CoP at a land-grant university. The findings of this initial phase of the program evaluation will be used to identify and describe the value and effectiveness of this model program for the CALS community. Findings and recommendations will also be utilized to improve the practice within the CoP as well as illustrate recommended implementation techniques for other institutions that seek to implement a pre-Professoriate training program based on a CoP design.

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Clarity and Accuracy in Plagiarism Policies at Land Grant Institutions

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Plagiarism is a complex, persistent, and often anxiety-causing problem for students. For these reasons, academic institutions have a duty to define plagiarism clearly and accurately. We use the Council of Writing Program Administrator's Statement on Best Practices for Defining and Avoiding Plagiarism (2005) to evaluate the clarity and accuracy of institutional plagiarism policies. The WPA Council warns that plagiarism policies too often confuse the more complex rules of scholastic best-practices (e.g., using style manuals correctly and providing clear attribution) with the simpler requirements for avoiding plagiarism. To avoid plagiarism, students merely need to distinguish clearly their work from others' work. Students do not need necessarily to do so in specific ways (e.g., using quotation marks), and they do not need necessarily to provide clear attribution (e.g., careful, complete citations). Using content analysis, we assess the clarity and accuracy of plagiarism policies for all U.S. land grant institutions created under the 1862 Morrill Act (n=58). Twelve institutions (21%) earn the highest score

for clarity and accuracy. Policies at the other institutions raise one or more significant concerns. Fourteen institutions (24%) have policies with language that is remarkably similar to another institution but no connection is acknowledged. We highlight examples of the best plagiarism policies (e.g. U of Hawaii, U of Nevada, Clemson U, and Virginia Tech) and explain how these policies help students avoid plagiarism.

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Six Ways to Discuss

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Drawing on the existing literature, we first identify and describe nine best practice criteria for designing student discussion strategies. The literature suggests that discussion strategies work best if (1) discussion questions are directed to particular students; (2) students critique fellow students' discussion contributions; (3) all students who are prepared have chances to contribute; (4) discussions clarify lecture and reading assignments; (5) discussions require students to communicate clearly; (6) discussions challenge students to justify their opinions and claims with evidence; (7) discussions count towards students' grades; (8) grading of discussions is transparent, fair, and easy to perform; and (9) discussions are fun. Second, we describe a novel, game-style student discussion strategy that satisfies these nine evaluation criteria. The strategy requires students to focus on six ways to discuss. Students can (1) ask a question, (2) respond to a question, (3) ask for clarification, (4) agree or disagree with someone, (5) give an example, or (6) relate one topic to another. Before class, students mark six cards each with their name and one way to discuss per card. Instructors keep track of individual student contributions by collecting discussion cards from students during class as students engage in discussion via the six prescribed ways. We use evidence from classroom observations and student surveys to support our hypothesis that this discussion strategy satisfies these nine best practice criteria.

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Cultivating Student Success through a Global Issues Course

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Many scholars note the importance of globalizing undergraduates' educational programs and call for increased student participation in study abroad experiences. Realistically, all students cannot study abroad, often due to financial constraints or the inability to leave home for an extended period of time. In response to this reality and with the desire to introduce students to international perspectives, a new course was introduced at North Carolina State University in Spring 2016. This course, "Global Issues in Agriculture" is a small discussion-based course, which introduces and encourages dialogue on issues from around the world. Throughout the semester, there is a focus on three overarching areas: aid versus development, sustainability, and international agricultural markets. Topics discussed in this course include: arsenic contamination in rice in Southeast Asia, micro-financing for small scale farmers, and peanut productivity and mycotoxin control in Ghana. After each class session, students submit a detailed written reflection, which have been analyzed to gain a better understanding of what students take away from this course. Some common themes which arose were: appreciation of our technology and resources, attention to other countries' system, knowledge gain, and a mention of emotions. This presentation will provide the emerging themes and the students' quotes associated with those, along with detailed information on the creation of the course and the course outline and structure. Understanding which aspects of the course impacted students' ways of thinking can help improve the planning of this course and similar ones in the future.

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Examining How Place Attachment Affects Citizen Perspectives of Albizia

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Over the summer I did an internship, giving me the opportunity to work with scientists, looking at

attachment and decisions, to learn about research design, field studies, data analysis, and scientific writing. Albizia (*Falcataria moluccana*) trees are native to the Moluccan Islands and are an extremely invasive species in Hawai'i. The Albizia trees also threaten Hawaii's native ecosystems by out competing the native flora and encouraging other invasive species to come in. Last fall when Tropical Storm Iselle hit the District of Puna on the island of Hawai'i, many Albizia trees within the subdivisions fell over causing extended power outages and inaccessible roads; yet the trees are not being controlled and continue to grow and spread. This study looks at connections between place attachment and an individual's decision to/ not to engage in Albizia control within his/her community. Through analyzing surveys distributed and interviews with residents there is no relationship between place attachment and Albizia control however; place attachment is significantly related to responsibility. The research shows that there are many things that are linked to place attachment but not all of them lead to the type of place attachment that will result in a sense of responsibility and engagement in Albizia control efforts. Through understanding not only what type of activities encourage responsibility but also how and where residents are getting their information from, we now know what types of venues would result in better results as far as educating citizens and having them engage in Albizia control efforts.

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Mapping Pedagogy, Learning Outcomes, and Effect Size in Effective Educational Programming

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The purpose of this study was to evaluate the effectiveness of the AIAI-FTFD (Attention, Interact, Apply, Invite – Fact, Think, Feel, Do) start-to-finish instructional model for human services educators in an ongoing educational program. Objectives included assessing knowledge (cognitive) confidence/attitude change (emotional) and skill (behavioral) gain for six learning outcome variables (e.g., communication, conflict resolution). The sample (n=89) consisted of participants ages 18-35. A self-report retrospective pre-then-post

quantitative survey instrument was employed. The data were analyzed using descriptive statistics and paired sample *t*-tests. Effect sizes were calculated in order to evaluate the standardized mean differences before and after program participation for each variable being studied. Focusing on effect size rather than statistical significance helps researchers determine the magnitude of standardized mean differences for a given sample and for specific identified variables. Noticeable ($d = >.50$) and clearly evident ($d = >.80$) effect sizes were found in perceived knowledge, confidence/attitude change, and skill gain for all six learning outcome variables. Because it can be difficult to separate program pedagogy from content, the authors of this study determined that using effect size to evaluate standardized mean differences from before to after program implementation was a viable first step to exploring and assessing the effectiveness of the AIAI-FTFD teaching model in facilitating change in an educational learning environment. Results will be used as a baseline for conducting further research in this programmatic area.

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Embedding Professional Development into a Problem-Based Transdisciplinary Obesity Prevention Course

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Studies have shown that employers are looking for a distinct set of "soft skills" from college graduates which include problem-solving, leadership, professionalism, communication, and teamwork, which have been shown to be lacking in recent graduates. A multidisciplinary research team from the University of Illinois at Urbana-Champaign, California State University at Fresno, and Purdue University, addressed this by embedding professional development/"soft skills" into the development of the Transdisciplinary Obesity Prevention Research Sciences Program (TOPRS), an applied research methods course on the

causes and consequences of childhood obesity. The professional development curriculum was designed to be used in conjunction with scientific content and hands-on field experience so that students would be provided with an opportunity to integrate skills into current practice. The curriculum was delivered at three sites in a blended format where students viewed micro-lectures prior to class, participated in in-class activities and discussions, and submitted online responses to questions that asked them to reflect on their experience in applying the topics to their field experience work. This presentation will discuss the variations in implementation across the three sites as well as quantitative and qualitative results that indicated that students (n=52) had a better understanding of the impact of professional development skills on their careers and more confidence in their knowledge of professional development skills. "Most of the specific information on professional development was all very new to me." "I used many of the skills that I learned throughout the semester in being hired for my first internship."

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