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2014 NACTA Abstracts

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NACTA Abstracts



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Preface

The NACTA Journal, Supplement 1 publishes the abstracts from the annual conference held each June. These abstracts represent oral and poster presentations given by faculty members and graduate students from colleges and universities in the United States, Puerto Rico, Canada and other countries.

The NACTA Journal is published quarterly by the North American Colleges and Teachers of Agriculture (formerly the National Association of Colleges and Teachers of Agriculture). It is directed toward the scholarship of teaching and learning in agricultural, environmental, natural and life sciences by presenting articles covering topics that treat all aspects of teaching such as methods, problems, philosophy, and rewards at the college level. All manuscripts undergo double-blind peer review. An author's guide for manuscript preparation is available on the NACTA web page: <http://www.nactateachers.org/> or are available upon request.

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Oral Presentations

009

Benefits and Barriers to Incorporating Service Learning in Landscape Horticulture Courses

Ann Marie VanDerZanden
Iowa State University

David Kopsell
Illinois State University

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 study was to determine if and how service learning is incorporated in the curricula of two and four-year landscape horticulture programs in the United States. A 27-question survey was sent to 140 faculty members who teach in these landscape horticulture programs. Survey questions gathered information on: university/college demographics; how service-learning was implemented in courses; the instructor perceived benefits of incorporating service-learning; and barriers faced when using service-learning in a curriculum. Of the 40 respondents, 20 were from 2-year degree programs, 16 were from 4-year degrees programs, and four offered both two- and four-year degrees. Although 68% of the respondents reported performing service-learning in their course(s), a majority of faculty (70%) reported having no formal training in how to use service-learning as a pedagogical method. On a five point scale the three highest rated reasons faculty used service-learning were to support student learning (4.32), to accomplish course objectives (4.28) and to increase students' civic engagement (4.24). Faculty also reported a number of barriers to incorporating service-learning including a lack of funding sources, difficulty fitting projects into the class/lab time available, and not receiving credit for using service-learning as a teaching strategy in their annual performance review.

014

Examining Client Satisfaction in an Agricultural Communications Service-Learning Course

Courtney Meyers*
Texas Tech University

Service learning is a pedagogy that seeks to provide a mutually beneficial relationship for all parties – student,

institution, faculty, and client – to ensure that service and learning enhance each other. Studies regarding the impact of service learning typically focus on the students, but feedback from all groups involved in service learning is necessary to ensure effective partnerships. The purpose of this study was to examine individuals' satisfaction of serving as clients in a service-learning course in agricultural communications. At the conclusion of each semester, clients were sent a link to an online questionnaire to gather their perspectives about the experience of working with a student to develop a media kit. After five semesters, students have worked with 114 clients and 60 completed the instrument (52.6%). Nearly three-quarters of respondents (76.7%, n = 46) agreed or strongly agreed that the experience met or exceeded their expectations. Almost all the respondents (96.7%, n = 58) agreed or strongly agreed the students were professional in all interactions. Forty-four respondents (73.4%) agreed or strongly agreed that they were satisfied with the final project students developed, and 70% (n = 42) agreed or strongly agreed the partnership was a beneficial experience for them. The client feedback is shared with students each semester to demonstrate the practical value of the service learning experience. The results of the client survey also identified areas that needed improvement such as guaranteeing students return the final project, reducing student procrastination, and preparing for meetings with the client.

015

Does Learning Run through Student-to-Student Interaction in Graduate Distance Education Classes?

Gary Moore,* Wendy Warner and David Jones
North Carolina State University

The literature suggests that student-to-student interaction is important in distance learning. However, the source for this recommendation appears to be based on research with face-to-face undergraduate classes from decades ago. Whether or not it is applicable to distance education graduate students in the 21st century is open to debate. This research sought to determine if graduate students taking distance education classes desire student-to-student interaction. Over 200 graduate students who completed one or more distance education graduate classes in agricultural and extension education from North Carolina State University during the past three years were surveyed. While some students enjoy student-to-student interaction and believe it is beneficial to learning, the majority of the respondents don't particularly like or want student-to-student interaction. They do not believe the potential learning advantage of having stu-

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dent-to-student interaction outweighs the time commitment. When various sub-groups of the population (disaggregated by gender, personality type, age, work status, and student status) were examined the results were the same. None of the sub-groups had overall positive perceptions of student-to-student interaction in distance education classes. The findings suggest, agricultural professors do not have to be overly concerned about student-to-student interaction in distance graduate education classes. If the professor feels strongly that interaction is an important component of the class, making it an optional component would be recommended.

021

Twitter and the Classroom: Two Birds Not of the Same Feather

Speeding with Technology Workshop

Laura Ingwers, Natalie Kincy and Dennis Duncan
University of Georgia

No generation before has ever been as constantly connected to technology as the Millennial Generation and there are marked social changes to support this, such as the ever present cell phone. As a strategy to better connect with students, Twitter was integrated into an agricultural leadership and service course at the University of Georgia through class assignments, and a weekly extra credit opportunity. The objectives of this presentation are to: (1) describe how Twitter has been integrated into this course, (2) describe students' reactions to the use of Twitter in the university classroom, and (3) provide recommendations for social media use in college classrooms. Subjects sampled were current students in agricultural leadership and service. The same survey was given to students in two different semesters, spring semester 2013 (n=65), spring semester 2014 (n=26) as part of class evaluations. Each semester's data was analyzed independently, with each semester's means and frequencies being compared. Findings indicate that students display a lack of enthusiasm for using Twitter in this class for assignments, and generally do not wish to see Twitter used in any of their other classes. However, despite this disinterest, students do enjoy Twitter as a potential outlet to earn extra credit points, even though most reported they did not take advantage of this. It is important for educators attempting to implement new technology into the classroom to understand that even though students use social media on a daily basis does not mean that they enjoy using it in the classroom.

037

Service Learning in Agricultural Communications: You Won't Believe It!

Erica Irlbeck* and Courtney Gibson
Texas Tech University

Research suggests that students retain more material, think critically, and are more engaged in the classroom when they are in a service learning course. The agricultural communications campaigns course at Texas Tech University is a service learning course. Students work with a community partner, or client, and prepare a campaign based on the needs of the client. Students create marketing materials and a plan for the client, and the students have materials for their portfolios. For Spring 2014, the client was an agritourism operation in Belize. In the first half of the semester, students learned about Belize and the client, investigated marketing strategies, and learned how to conduct a SWOT analysis and research investigation. During spring break, 14 students traveled to Belize. While there, they worked with the client by experiencing the agritourism operation and interviewing the client so that a more effective campaign could be designed. The students conducted a SWOT analysis, investigated the southern Belize tourism industry, and collected survey data with tourists to the area. Students also toured historic Belizean sites, a port where agricultural products are shipped, several farms, and other typical tourist destinations. When they returned, they designed the campaign and promotional materials including a video, media talking points, t-shirt designs, and print advertisements. Students in the course gained the experience of working with an actual client as well as the opportunity to travel abroad, learn about a new culture, and assist a client that did not have the resources to hire a marketing agency.

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038

Tackling Difficult Science Concepts Using 21st Century Pedagogy

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There is rising concern regarding the ability of the U.S. workforce to meet global demands of the 21st Century (APLU, 2009). This is especially true within professional fields associated with science, technology, engineering and math (STEM). This concern is predicated by an escalating phenomenon in post-secondary education. Currently, only 15% of the total student population declares a STEM major (Duncan, 2009). Of those, only 6% receive their degree within six years (Chen, 2009). Subsequently, it can be argued that a majority of students struggle with post-secondary STEM education. As we focus more closely on agriculturally based STEM, it is imperative that we reexamine our approaches toward undergraduate education (NRC, 2009). To begin this process, researchers at a southern land grant institution evaluated difficult science concepts associated with an introductory Domestic Animal Biology course. Concepts were categorized thematically based on several years of student exam scores and faculty responses. The most difficult animal science concept, animal digestion, was chosen as the framework for an interactive online video game. Researchers, animal scientists, and game developers worked collaboratively to develop a learner-directed virtual environment that incorporated declarative, procedural and situational digestive concepts. The game was offered to 260 introductory animal science students in an effort to enhance both content knowledge and scientific efficacy. Results indicated that both content knowledge and efficacy were enhanced for all 86 student participants. Results from this exploratory study shine new light on contemporary technological enhancements and instructional practices within post-secondary animal science education.

047

Phases of Beginning Teacher Development and the Relationship to Concerns Expressed by Agricultural Education Student Teachers

Jaclyn F. Tweeten,* Thomas H. Paulsen and Ryan G. Anderson
Iowa State University

Student teaching is an important experience where pre-service teachers learn the skills they need to become effective teachers. During the student teaching experience candidates develop concerns for themselves and their students and it is important for them to communicate these concerns. This study was designed to identify concerns of student teachers, determine if they varied by gender, and determine if they aligned with the developmental stages of a first year teacher. Understanding teaching concerns during the pre-service agricultural teacher education program will allow teacher educators to lessen the self-adequacy concerns of pre-service teachers. The population consisted of agricultural education student teachers from Iowa State University (N=26) who participated in an electronic community of practice using Twitter. A Twitter group was specifically created for the participants of this study. The teaching concerns 'tweeted' by student teachers were coded upon completion of the student teaching experience. Tweets received a second code based upon the developmental stages of a first year teacher. Intrarater reliability was established at $\alpha=.95$ level. Tweets were coded twice at a four week interval. Discrepancies in coding were coded a third time. Student teachers expressed more self-adequacy concerns than any other concern. Male student teachers had a higher percentage of tweets regarding self-adequacy concerns than female student teachers. Student teachers experience the same phases as first year teachers. In recognizing concerns of student teachers, and the phases through which new teachers progress, supervisors of pre-service teachers can utilize these concerns to assist in formative supervision activities.

049

Instructor and Student Reflections of a Flipped-class Model in a Sensory Evaluation of Foods Laboratory Course

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The flipped class model encourages student engagement and learning within the classroom through group activities and discussions rather than traditional lectures. Applying this model to a laboratory course creates an environment where students directly apply classroom knowledge to activities facilitated by an instructor but directed by students. This model was explored in a Food Science and Human Nutrition laboratory course on the Sensory Evaluation of Foods. Nine groups of students were given different food product categories and scenarios guiding them through three types of sensory evaluation methodologies: discrimination test, descriptive analysis, and consumer test. Students designed, executed, and analyzed their own sensory tests that simultaneously aligned with topics covered in the lecture portion of the course. Their findings were shared through written reports and oral presentations. Upon course completion, students filled out instructional surveys. Surveys revealed that the laboratory organization successfully reflected lecture content and allowed for a majority of group project completion during lecture and laboratory sessions. Student comments indicated that integrating lecture knowledge with hands on experience by designing, executing, and analyzing their own tests improved learning. Instructor reflections on the course indicate that the flipped class structure allowed for greater discussion, interaction, and critical thinking development than previous laboratory courses. Course instructors felt greater confidence in student's ability to apply course knowledge to a real life testing situations. The flipped class model can successfully be used in a laboratory setting to increase student engagement and active self-learning. These learnings could be translated into other scientific laboratory curricula.

054

Learning Runs through Classroom Debates: What Debates Can Teach Us about Sharing the Agricultural Message

Dixie Watts Dalton
Southside Virginia Community College

Many state legislatures have considered policies to label foods containing genetically modified organisms. To determine the types of information that influence individuals' perceptions of GMOs, in-class debates were conducted in an agribusiness course. Some students were assigned to teams of three to debate the pro- or anti-GMO position. Using a Likert scale, students reported their GMO knowledge and perceptions of GMOs before and after the debate. They also indicated the types of information most likely to persuade them to change their perceptions and indicated the sources they would most likely use to learn more about the topic. Prior to the debate, 29% of students indicated they had little knowledge of GMOs, 64% were somewhat knowledgeable, and 7% were very knowledgeable. After the debate, percentages changed to 0%, 50% and 50%, respectively. Prior to the debate, 43% of students were somewhat anti-GMO, 14% had no opinion, and 43% were somewhat pro-GMO. Post-debate, the percentages changed to 29%, 0%, and 64% respectively, with 7% indicating they were strongly pro-GMO. Respondents indicated that they were most interested in food safety and nutrition aspects of GMOs, as well as environmental impacts and sustainability. Cost/price considerations were not as important. Sources that respondents were most likely to utilize were government agencies, university researchers, and general GMO websites. Survey results provide insights for the agriculture industry when attempting to influence consumers and policy-makers. In-class debates are an effective student learning tool and can provide insights that can be used by the agricultural industry.

056

Social Media and Equine Science: The Effect of LinkedIn on In-Class Engagement and Grades of Equine Higher Education Students

Speeding with Technology Workshop

Elise A. Lofgren, Alyx M. Shultz and C.A. Shea Porr
Murray State University

Social media is a staple of communication in society today, allowing people worldwide to interact with one another with the click of a mouse. Websites such as Facebook, Twitter, Myspace, and LinkedIn, all provide a template for communication that connects users, where they can share ideas, new information, and discuss current issues. This study examined the benefit of using a social media site as a teaching tool in equine higher education curriculum. In particular, it involved the incorporation of the social media site LinkedIn as a required participation effort for equine science students. Two equine science classes were selected for participation in this study. Both

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classes were taught by the same instructor and in a traditional lecture/discussion format, however, one course had an additional social media component added. Both courses met face-to-face with the instructor for one 3-hour session each week. The traditional group (TRAD) completed standard assignments during the semester. The treatment group (LINK) participated in assignments during the semester using LinkedIn. Pre-course, mid-course, and post-course surveys were conducted in each class and grade data was collected at the end of the semester. The data was analyzed using descriptive statistics and scatterplots. While the low number of students in both courses made correlational analysis unachievable, there was noticeable positive feedback from LINK students regarding their interactions with LinkedIn during the class. If repeated with a larger student pool, this study has the potential to obtain more statistically significant data on the effect of social media within equine science classes.

057

How Ready Are Agricultural Graduates for a Career?

Murari Suvedi and Ramjee Ghimire
Michigan State University

Agricultural colleges have designed curriculum so their graduates have cutting-edge and employable skills. College of Agricultural and Natural Resources at Michigan State University strives to maintain cutting-edge curriculum to address the changing needs of agricultural industry and farming. This presentation will share findings from an online survey on graduating seniors' perceptions about career preparedness learning outcomes. Data were gathered from 2,556 graduating seniors over a 10 year period from 2004 to 2013. Findings showed that career preparedness levels have improved over the years, i.e., from 2004 to 2014. Knowledge applicable to anticipated career path received the highest ratings ($m=4.03$) while diversity ($m=3.4$) and computer technology and database research skills ($m=3.5$) received the lowest ratings. Students who participated in an undergraduate research experience felt more prepared for a job than without it, but those with specializations felt the opposite. Females perceived that they more competent than males in team work; students from suburban backgrounds rated critical thinking and problem solving and verbal communication skills higher than others. Asian-American, Hispanic, and Native-American students gave the highest ratings to critical thinking and problem solving skills, diversity, and written communication skills, respectively. International students' ratings were the lowest on most learning outcomes. Findings imply that

academic departments and schools should emphasize instruction on diversity and/or promote diversity-based organizations. Opportunities for students to hone their research and computer skills including software, data management and data analysis are needed. Finally, there is an urgent and felt need to discover and address the problems and needs of international students.

058

Graduates of Agricultural Programs Attitudes Regarding Basic Employability Skills

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This study builds on a 2013 NACTA presentation and describes the attitudes of graduates of all Cal Poly Pomona College of Agriculture programs regarding the basic employability skills received in college, the importance of these skills in their first job upon graduation, and their competency level in these skills. A social contract exists between students, educational institutions, and employers that the outcome of the educational experience will prepare students to be career ready with the skills needed to enter and succeed in the workforce and the skills that employers' desire. A survey was designed using three 5-point Likert scales. Ten dimensions of basic employability skills were the focus of this study: communication, math, problem solving, management, interpersonal, customer service, leadership, life-long learning, technology, and work ethic. 425 invitations were successfully deployed via email. 77 respondents agreed to participate in the study. Contrary to the research literature that found communication and math skills as most important, graduates reported technology skills as the skill most received in college and interpersonal skills ranked as most important to their job and the highest level of competency. Math skills were ranked lowest in all 3 scales. Communication skills were ranked second in reception and second to last in importance and competency. Better understanding of graduate attitudes allows college leadership to evaluate courses to improve student success. Future Study will be conducted to examine the attitudes of faculty and employers in the same dimensions to provide a triangular study.

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059

Cultural Adaptation: Study Abroad in Costa Rica

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University of Florida

In an effort to internationalize the undergraduate curriculum, universities have increased their use of short-term study abroad programs. Short-term study abroad programs in Agricultural and Life Sciences often focus heavily on the academic aspect of the program and do not emphasize cultural aspects of the short-term study abroad program. The purpose of this study was to explore how College of Agricultural and Life Sciences students from the University of Florida respond to the culture during a ten day experience in Costa Rica. Twelve undergraduate students involved in the College of Agricultural and Life Sciences Leadership Institute (CALSLI) participated in a short-term study abroad program focusing on leadership. This qualitative study used 4 forms of data collection: pre-travel questions, reflective journaling, photographs with captions, and post experience questions. Triangulation, referential adequacy materials, thick description, and a methodological journal were used to address trustworthiness. Data was analyzed by using open coding, axial coding, and selective coding as part of the grounded theory analysis method. Seven stages of cultural adaptation emerged: initial feelings, cultural uncertainty, cultural barriers, cultural negativity, academic and career development, feelings throughout the program, and cultural growth. The identified stages of cultural adaptation were uniquely experienced by the participants and were in a non-linear fashion. It is recommended that study abroad facilitators educate students about possible stages of cultural adaptation that may be encountered during the program. Facilitators should also incorporate both individual and group reflection into their programs in order for the students to reflect over their cultural experiences.

060

Towne's Harvest Practicum at Montana State University: The Added Value of Field-Based Learning on a Campus Farm

Field-Based Learning Workshop

Alison Harmon, William Dyer, Bruce Maxwell, Macdonald Burgess and Kara Landolfi
Montana State University

Campus farms have proliferated in recent years at leading universities, and their presence can attract new students to the study of food and agriculture. Field-based experiences at campus farms contribute to workforce preparation through application of classroom learning, community engagement, interdisciplinary interactions, mentoring relationships, and practical skill development. To justify their resource costs, it is useful to assess whether campus farm experiences are adding sufficient value to traditional classroom learning. Towne's Harvest Garden (THG) is Montana State University's 3-acre campus farm, serving as the backbone of the 2009 initiated Sustainable Food & Bioenergy Systems Degree Program (SFBS). SFBS students spend one summer at THG earning course credit in a Practicum, which provides them with hands-on experience planting, maintaining, harvesting, and marketing vegetable crops on a small scale. This learning assessment is based on five years of pre/post practicum survey data involving 75 students. Specifically, the survey assesses the impact of the Practicum experience on students' food choices; skill development in areas such as farm planning, irrigation operations, IPM, composting and food marketing; and professional development, interactions with classmates, and career goals. Additionally the survey addresses the challenges of field-based learning and solicits suggested improvements. The experience solidifies the career plans of a small subset of students to operate market farms. Students have a stronger preference for locally grown food at the conclusion of the experience, they gain practical skills, and develop an appreciation for the amount of work required to successfully grow and market food on a small scale.

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070

Using Capstone Semester Courses in Conjunction with Internships that Equate to High Percentage Employment upon Graduation

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The capstone semester includes five weeks of on-campus classroom instruction followed by a ten week internship. This is repeated in the fall, spring and summer semesters, with more than 15 interns each semester. The students are placed with an agri-industry, agriculture business, or agency full-time for the ten week period. The five week on-campus instruction is conducted in a block setting where students are required to dress professional every day. The block instruction includes a leadership development course where critical thinking and problem solving, resume building, team work, time management and ethics are taught. An additional methods course includes agricultural agencies' policies and procedures, benefits packages, credit repair and protection, social media etiquette, buying and selling of first homes and automobiles along with other life skills. The third course is a portfolio media course where students prepare a professional electronic portfolio and learn about reflection skills necessary to integrate classroom theory with real-world experience. Through critical reflection of the internship experience, students gain a deeper level of understanding of the in-class material. These capstone courses help jump start the students in their internships, they also give them confidence and a foundation for being successful on the internship as documented through their evaluations from their internship supervisors. Over the past ten years over 30% of these students have full time employment or accepted in a graduate school program prior to graduation.

071

Building a Successful Student Experiential Learning Program

J.K. Bush*
University of Texas at San Antonio

Through initial funding from the NIFA Hispanic Serving Grant Program, we have built a long-term sustainable experiential learning program in natural resources and conservation. The TREE Program goals are to recruit, retain, and financially support underrepresented undergraduates and graduate students. The Program also encourages undergraduate Hispanic students to obtain

advanced degrees. The initial funding from NIFA has led to the establishment of a cross-continent partnership between the US Forest Service and the UT at San Antonio. This has allowed the TREE Program to become sustainable. Results of interviews of participants by an external review indicate 1) the Program gave an identity to students interested in conservation and natural resources that did not previously exist at UT San Antonio, 2) prior to being a Fellow, students had virtually no idea about careers in natural resources and conservation or about how one would go about getting graduate training in these fields, and 3) the research experience opened their eyes to research in their fields and their discovery of how much they enjoyed it. These findings are confirmed by the percentage of undergraduate students who have completed the Program who have continued their education or are applying to obtain advanced degrees (60%). One-hundred percent of the students who started the Program as master's level students completed or are completing their doctorates. The program has increased the number of minority and disadvantaged students participating in conservation and natural resource research, obtaining advanced graduate degrees, and obtaining careers in conservation and natural resources.

078

Differences in College of Agriculture and Life Sciences Students' Expectations of Instructors, Advisers, and Self, During Their College Experience

Elizabeth A. Foreman* and Jodi A. Sterle
Iowa State University

Reforms in higher education have led to a greater focus on student recruitment and retention. A better understanding of student's expectations can help address retention issues among undergraduate students. Traditional-age undergraduate students who were classified as freshman, sophomores, and seniors in the College of Agriculture and Life Sciences (N=2889) were sampled. Participants completed a web-based survey to examine students' expectations of advisers and instructors as well as what students believe advisers and instructors can expect of them. The response rate was 45.03 (n=1301). Composite variables were computed to represent student expectations of advisers, student expectations of instructors, and what students believed faculty and staff could expect from students. ANOVAs showed significant different expectations of instructors ($F(2, 1076) = 3.40, p = .034$) and advisers ($F(2, 1060) = 4.89, p = .008$), based on classification. Post-hoc testing revealed that seniors had significantly lower expectations of their ad-

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visers than freshman and sophomores. In addition, students were asked what college faculty and staff could expect of them. ANOVA showed significant results ($F(2, 1064) = 10.109, p = .000$). Post-hoc testing revealed that when compared to freshman and sophomores, seniors felt faculty and staff should have significantly lower expectations of them. These results have implications for faculty and staff as they work with undergraduate students, specifically seniors. It seems that seniors work more independently of faculty and staff and rely less on them for guidance.

081

Does the Number of Post-Secondary Agricultural Mechanics Courses Completed Affect Teacher Competence?

A. Preston Byrd,* Ryan G. Anderson and Thomas H. Paulsen
Iowa State University

Preparing teachers to teach agricultural mechanics is a difficult task since many topic areas are covered. This study examines the effect of the number of college courses taken on a teacher's perceived competence to teach agricultural mechanics. Agricultural educators in Iowa ranked themselves according to their perceived, individual competence in 54 skill areas associated with agricultural mechanics curricula. These teachers also indicated the number of agricultural mechanics courses they completed in their teacher preparation program. Thirty-six (36) Iowa secondary agricultural education teachers indicated that they have not taken any college courses related to agricultural mechanics. Thirty (29%) Iowa secondary agricultural education teachers indicated that they have only taken one course relating to agricultural mechanics. Iowa secondary agricultural education teachers identified that they were most competent to teach structures and construction skills and least competent to teach electrification. The teachers who completed one or less courses had low to slight perceived competence while teachers who took two or more courses identified a moderate perceived competence in agricultural mechanics. Teachers indicating six or more classes completed exhibited a high-perceived competence. A positive correlation was identified between courses completed and perceived competence as the more courses taken the higher the self-perceived competence level of the teacher. To develop the competence of pre-service agricultural education teacher candidates it is recommended to examine the current agricultural mechanics curricula in teacher preparation programs. It is recommended that professional development be offered in areas identified as having low perceived competence.

091

Agricultural Students' Perspectives of International Experiences: Opportunities and Challenges to Meeting Students' Needs

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Texas A&M University

International experiences have the potential to drastically impact students both personally and professionally. The development of effective international experiences requires an understanding of students' perspectives. Therefore, the purpose of this study was to document agricultural students' perspectives of international experiences. Survey methodology was implemented and a total of 189 students completed the instrument. Findings revealed that 116 of the 189 students (61%) had participated in an international experience. Of the 73 students without an international experience, only 25 had no interest in pursuing an opportunity. The students preferred study abroad programs facilitated by their home university and international internship opportunities. They favored service learning and non-academic field trips hosted by their home institution over study abroad programs hosted by other universities. Additionally, students indicated that they preferred programs lasting three to six weeks. Australia and Italy were cited by more than 70 students as a highly desired country to visit. Strongest motivators for students to pursue international opportunities included an enhanced life experience, increased employability, and an improved resume. Cost was the most dominant factor related to program selection with the country, subject matter, and cultural attractions in the area also considered very important. As educators strive to provide international opportunities for students, it is important to be aware of students' perspectives. The results of this study indicated the need for colleges of agriculture to provide their own study abroad and internship programs for students. Additionally, careful attention must be made to program cost and destination.

100

Blogging about Turfgrass Weeds: A Strategy to Improve Students' Writing Skills in a Turf Weed Management Course

Speeding with Technology Workshop

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Mississippi State University

Blogging is a tool that is increasing in popularity among all ages and for many different uses. The use of blogging in the classroom is a unique tool to increase student comprehension and writing skills. Blogging in teams allows students to receive feedback from their peers to improve their writing. Students enrolled in Turf Weed Management at Mississippi State University were randomly assigned into groups of three to research, write, and publish a blog post on an assigned weed species. Students completed a brief questionnaire prior to working on the assignment to determine their familiarity with blogs. Of the 13 students in the class, 10 (77%) had never contributed to any blog. Following the initial blog posts, the instructor identified areas for improving the quality of content and writing ability. Spending more time initially helping students interpret appropriate information found on the Internet resulted in higher quality content in later posts. Also, going through line by line with students on each blog post has resulted in a more concise writing style. Students completed a questionnaire at the midpoint of the semester to assess how they were progressing with the assignment. Twelve students responded they were highly satisfied with the blogging portion of the course. The blogging component of the course has helped improve student writing skills and the ability to find reliable information about individual weed species.

104

A Review of Select Water Education Initiatives of the Last 40 Years

Alexandra Hill, Carl Igo* and Clayton Marlow
Montana State University

The Clean Water Act of 1972 brought public attention to the issues surrounding water quality and availability in the U.S. Although the Clean Water Act was not an educational initiative per se, it did provide the foundation and interest for education on water related issues. The authors reviewed and categorized select water education initiatives implemented in the last 40 years and exam-

ined their long-term efficacy. Educational efforts were examined in the context of historic and current environmental education theories and behavior change models. Water users were separated into three consecutive generations. Within the first generation, the authors looked at the Chesapeake Bay cleanup and the Lake Erie cleanup along with associated education efforts. The second generation was identified by emphasis on non-point source pollution and respective education efforts. The third, and current, generation has focused on technological advances and their impacts on water rights, use and mitigation. Environmental educators must strive to provide fast, fact-based information and to increase individual self-efficacy by modifying cultural and perceptual norms regarding historic water use. Agricultural educators should view themselves as a primary source of environmental and water resource education; they must also understand how to facilitate a dynamic learning environment with a focus on responsible water use and stewardship. Additional research is needed on impacts from and to specific demographic water users as well as the most effective content and contexts for water resource and educational programming.

105

Associations between Learner Interaction and Performance in an Online Course: A Longitudinal Study

Greg Miller
Iowa State University

Interaction is important for online learning and can be easily monitored within course management systems. The purpose of this five-year longitudinal study was to analyze student interaction and achievement in an online research methods course. The population included 117 students. Most were majoring in Agricultural Education (n=71) or Professional Agriculture (n=36). Groups of students who earned grades of "B+ or lower" and those who earned grades of "A- or A" were compared on the average number of times they engaged in nine different interactions. In 45 out of 54 comparisons, the average number of interactions for the "A- or A" groups exceeded the average number of interactions for the "B+ or lower" groups. Pearson correlations were calculated between "final percentage grade" and nine different interactions by year. Eleven of the 54 correlations had medium to large effect sizes based on Cohen's (1988) descriptors. It is important to note that the influence of specific interactions varied – sometimes dramatically – by year. Learner-content, learner-instructor, and learner-learner interaction all had a positive influence on grades. Interaction with course content had the greatest impact.

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Even so, instructors should not expect any particular amount or form of interaction to be an unqualified predictor of achievement. Students differ in the ways that they approach learning and in their need for different types of interaction. To accommodate a range of student needs and preferences, it was recommended that students be afforded a variety of ways to interact with course content, each other, and the instructor.

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Sustainable Service Learning: Lessons Learned from Five Years of Successful Partnership

Tammy J. Stephenson
University of Kentucky

Service learning (SL) promotes student engagement, improves critical thinking skills, fosters communication and teamwork, and enhances academic curriculum. Colleges of Agriculture have the unique opportunity to partner with Cooperative Extension programs and professionals to develop sustainable SL activities. The objective of this presentation is to provide practical, evidence-based, recommendations for not only developing, but sustaining, SL activities. Over the past five years, \$250,000 in grant funding has been secured from external sources and 340 undergraduate dietetics and human nutrition students have successfully engaged in the *Plate It Up! Kentucky Proud (PIUKP)* SL activity. Throughout the project, upper-level students have used their nutrition and food preparation knowledge to develop 188 healthy recipes using locally grown fruits and vegetables; 53 of those recipes have been fully developed as professional printed recipe cards with one million cards distributed throughout the 120 counties in Kentucky. Since 2009 the SL project has expanded to include experienced undergraduate students supporting the project as instructional assistants for the recipe development and testing component of the class, surveying market patrons and producers, representing the project at local and national professional meetings, spotlighting the project on radio and TV broadcasts, and developing a PIUKP mobile device App. In our experience, sustainable SL projects (1.) are student-driven, (2.) engage a strong community partner with a shared vision, goals, and understanding of higher education, (3.) are best supported by sustained grant funding (4.) incorporate a research component, and (5.) evolve based on faculty, student, and community partner feedback.

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Utilizing Poll Everywhere to Create Word Clouds

Speeding with Technology Workshop

Gaea Hock*
Mississippi State University

Audience response systems (ARS) in the higher education classroom are increasing in both popularity and usage. One such ARS is Poll Everywhere, which allows students to text in their responses to different question types (yes/no, multiple choice, short answer, etc). Word clouds are not a new teaching technique, but the ability to generate word clouds using a website allows for quick visual analysis of student responses. The more often a word shows up in the response, the larger it appears in the word cloud. One website that can be used to generate word clouds is Wordle. I have used Poll Everywhere and Wordle in several classes. An example of how this teaching strategy has been applied was asking students to attend a career fair and interview potential employers. One of the required questions was "What are the top five skills/traits/abilities you are looking for in future employees?" Students texted their responses into a Poll Everywhere poll then they were put into a Wordle to generate a word cloud to visually display the most prominent skills. This teaching technique has also been used to ascertain students' prior experience with youth organizations, the top skills youth should develop in agricultural leadership organizations, and traits youth organization advisors should possess. The Wordles are saved as pdfs and are uploaded to the course management system for the students to access. Wordle is free and Poll Everywhere is free for the first 40 responders. Students appreciate being actively engaged in creating the visual end product.

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The Evolution of Electronic Textbooks in Higher Education – What do our Students Think?

Speeding with Technology Workshop

Tammy J. Stephenson and Dawn Brewé
University of Kentucky

Electronic textbooks (e-texts) provide an economical, accessible, and engaging option for today's college student. Between 2009 and 2013, the percentage of textbooks sold as e-texts rose from 2% to 11%. Over the

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past ten years, e-texts have evolved from pdf copies of print textbook pages to e-texts that are interactive including highlighting, note-taking, and collaboration features. At this time, little is known about student usage of this technology. The purpose of this study was to assess student attitudes towards e-texts in a non-majors, distance-learning, high-enrollment course. All students (n=652) enrolled in the course were provided free access to the e-text; 75% of students (n=489) completed an end-of-semester online survey. Forty-seven percent of the students had used an e-text in at least one prior course with 38% of students agreeing that e-texts have become a part of their learning. Fifty-two percent of students found that using the e-text the first few times was difficult for them. Most (71%) reported they studied similarly with the e-book as they do with a paper textbook. Student and instructor highlights/annotations and instructor added material were the most useful features when studying. Despite the increased prevalence of e-texts, 76% of students indicated they prefer to read college textbook content in a print book, 12% on a computer, 3% on a tablet, and 1% on a smart phone. Faculty can use student feedback to better understand why and how their students are using e-books to design engaging and student-centered courses incorporating this evolving technology.

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Designing Experiential Learning Materials to Make the Best Use of Teaching Farms

Field-Based Learning Workshop

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University of Florida

Pablo Morales-Payan
University of Puerto Rico

Michelle Schroeder-Moreno
North Carolina State University

Geoff Zehnder
Clemson University

The use of teaching farms in higher education in the US is growing at land grant and other universities. Institutions that operate teaching farms invest significant resources in their maintenance and operation. The goal of this project was to develop materials about sustainable agriculture that faculty members can use to enhance the value of the teaching farm for students, faculty and the institution. The project had several components. We

started by developing an inventory of teaching farms and analyzed how instructors incorporate them into their courses. We followed with interviews with faculty members at a sample and used the information they provided to develop a typology of four approaches instructors use to incorporate teaching farms in their courses. We then developed teaching materials in for instructors whose use of farms focuses on developing higher cognitive skills. The materials are based on Kolb's experiential learning theory and Angelo and Cross's six teaching goal areas. Formal and informal assessments of learning were incorporated in the modules to help instructors determine if they are reaching their stated teaching objectives. The materials were evaluated in classes at multiple institutions to determine their effectiveness.

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Activating Learning for Agriculture Students: Strategies from the Design Studio

Sean Rotar and David Barbarash*
Purdue University

Active learning techniques seek to engage students more directly and to energize their learning processes. Techniques such as project-based learning, immersive and service learning, and short study design exercises are all potential components of an active learning classroom pedagogy. Current research emphasizes the effectiveness of these kinds of alternative teaching strategies in engaging and motivating students at multiple levels. The design studio sequence of any design curriculum asks students to apply assimilated knowledge, use judgment to analyze and evaluate information and potential solutions, and to think creatively as they develop solutions to specific problems. Successful studio environments use active learning methods to increase student engagement and improve learning outcomes. In addition, design studio relies heavily on students' ability to employ material from other courses and other outside experiences to inform their design work, a necessity that the authors observe is increasingly difficult for students to achieve. Realizing students' struggle to integrate knowledge from these several sources within the confines of a typical curricular structure, the authors have embarked on an innovative strategy to foster the connection of knowledge areas: the integration of several course topics in our junior-level curriculum through a single, encompassing, iterative project. This single project asks students to integrate knowledge from four different technical areas and involves the input of multiple faculty to create a project that is a seamless whole, replicating the process and iterative nature of a professional office setting. The authors are measuring the degree to

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which this method is effective in producing better student outcomes through a series of project reflective surveys. Results indicate a statistically significant increase in student perception ($\alpha=.05$) of their abilities to integrate these four topics into stronger design solutions. The authors have systematically engaged in introducing active learning techniques in the classroom and will discuss methods that have been found to be effective in design education, will relate the results of study of efficacy, and will offer perspectives on these methods' applicability for other educational settings in agriculture.

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Digital Natives in College: What Happens to Learning When the Power Shuts Down?

Jennifer E. Rivera, David Ngyuen, Geoff Habron, Karla Loebick, Kate Glanville and Felix K. Yeboah
Michigan State University

Electronic portfolios (ePortfolios) are growing in popularity across departments, colleges and universities. Despite the proliferation of these authentic assessment tools, not much is known about how these tools assist students in connecting the in-class learning with other experiences. Our qualitative study involved three parts: (1) a survey of all students within the Liberty Hyde Bailey Scholars Program, which is an academic program in the College of Agriculture and Natural Resources at Michigan State University with an emphasis on the Scholarship of Teaching and Learning (SoTL), (2) semi-structured interviews with students focusing on their origins of reflection and electronic portfolios and (3) semi-structured interviews with the program faculty who implemented this change to examine the theoretical and practical underpinnings of the decision to implement ePortfolio. Our study highlights three primary findings: (1) we should not make assumptions that students know and understand the concept of reflection; (2) meanings of reflection, authentic learning, and evidence of learning differs among faculty and students; and (3) there are challenges in changing the culture of learning with the integration of technology that focus more on meaning making than technology implementation. These findings have important practical and theoretical implications for future students and faculty. As educators, we must embrace technological innovations such as ePortfolios while simultaneously acknowledging that students need to be challenged and supported while they are participating in reflective experiences.

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Students as Stakeholders: Building an Undergraduate/Graduate Certificate in Environmental Education

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University of Georgia

Certificate programs have become popular, complimentary experiences for undergraduate and graduate degrees. While certificates provide opportunities for students to experience a subject without officially declaring a major or minor, the certificate program is typically developed by faculty. As the target audience for certificate experiences, empowering students to serve in an advisory role during certificate development seemed highly desirable. This presentation will: (1) describe the techniques used by students and collaborating faculty to develop the certificate proposal and (2) share suggestions for other universities interested in developing a certificate through direct collaboration with students. A team of eight undergraduate and graduate students were involved in all phases of developing the environmental education (EE) certificate proposal. These students contacted coordinators of existing EE programs at other universities, identified existing courses which could contribute to the certificate while proposing courses which were needed, and developed and administered a questionnaire campus-wide to assess student interest. Working with faculty, they analyzed the 152 completed questionnaires using SPSS and domain analysis and discovered that while the majority of students (93.6%) agreed that an EE certificate should be offered, freshmen, sophomores, and juniors specifically needed the most help understanding EE. When asked about the value of this experience and suggestions for others, the student stakeholders valued the ownership and power they were given to make a difference campus-wide and suggested that others (a) not be afraid to be different, (b) build on existing courses, and (c) encourage students to be part of every phase in certificate development.

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Describing Social Media Footprints of High-Impact Experiences using Instagram

Speeding with Technology Workshop

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Texas A&M University

Millennials are hyper-connected, digital savvy students seeking innovative engagement and interaction. High-impact experiences have become valuable educational tools offering unique, memorable learning opportunities. As high-impact learning is implemented in a digital age, how do we measure students' impressions of these experiences? This study describes the reach, scope, and impact of the footprint left by participants using social media by describing 1) what students shared, 2) how they shared it, and 3) the reach of shared interactions. Researchers studied images shared through Instagram by students and instructors in two high-impact experiences; a two-week study away from campus in the Southwestern United States and a study abroad program in Namibia. Participants in this study traveled 25,380 miles, shared 593 images, recorded 1513 "likes" and 200 comments from hundreds of users in 15 countries and 23 U.S. states. Researchers used process coding and content analysis to categorize the activities, themes, and locations shared in each image, offering a description of what participants shared. Frequency counts of features including tags, frames, and filters were used to describe how images were shared. Geographic locations of users who liked or commented on participants' posts were recorded to describe the reach of the shared experiences. Results indicate that Instagram is a powerful tool that can be used to share high-impact experiences, resonating with and engaging millennials. Further strategies and implications of measuring social media footprints will be shared to promote future research and best practices.

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Learning Runs through the Bailey GREENhouse and Urban Farm

Field-Based Learning Workshop

Madeline Judge, Laurie Thorp, John Biernbaum and Matt R. Raven
Michigan State University

According to the National Research Council (2010), large scale transformative change is needed in agriculture to sustain global food and ecosystem security. It was advised that colleges of agriculture should concentrate on shaping curricula around real-life issues related to the world's food systems. The Michigan State University (MSU) Bailey Residential Hall GREENhouse and Urban Farm (Farm) has adopted a strategy for accomplishing this goal by leveraging partnerships between sectors of the institution to provide students with experiential learning opportunities in order to develop a sense of community grounded in the context of sustainable food production. The Farm allows students to connect with their campus home in a tangible way through entrepreneurial organic food production. This includes composting of dining hall food waste, vermicomposting, marketing, management of a 70'x 30' hoophouse, edible landscaping and green roof. A series of interviews were conducted with freshmen residing in Bailey Hall early in the fall and in late spring to determine their sense of community and if involvement with the Farm impacted it. A series of open-ended questions focused on sense of community and experiences with the Farm were constructed. In between the interview sessions there were numerous workshops and engagement opportunities for students to work together in a space conducive to learning about food systems/agriculture and interpersonal relationships that make up a community. Content analysis was used to identify five key themes that contributed to sense of community: shared values, opportunities for experiential learning, ethic of care, service to the larger community, networking.

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Student Learning Outcomes: Qualitative Assessment Method used in a Civic Agriculture and Food Systems Minor

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Virginia Tech

Jenny Schwanke
YMCA at Virginia Tech

The Civic Agriculture and Food Systems (CAFS) minor at Virginia Tech responded to the National Academy of Sciences report, Transforming Agricultural Education for a Changing World, by implementing an experiential and community-based curriculum to agriculture education. Answering this call for agricultural literacy across the institutions disciplinary boundaries served both as a student recruitment and success measure for agriculture as a field of study and profession. The CAFS minor was strategically designed with programmatic goals and stu-

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dent learning outcomes (SLO) embedded into the curriculum. It is composed of four required core courses and electives that align course learning objectives with programmatic goals and SLO. This study assessed fulfillment of SLO through qualitative methods of data analysis. The common assignment across the core courses used to assess SLO was a critical reflective writing. A final reflection was completed in the last CAFS capstone course after students designed, implemented, and evaluated a community action project to demonstrate skills learned. The final critical reflections (n=10) from the Fall 2013 capstone course were imported into Atlas-ti where content analysis used constant comparative methodology. Content analysis results of student work revealed fulfillment of programmatic goals and SLO and included emergent themes. Application of these findings will be discussed and include how critical reflection writing assignments and corresponding assignment guidelines validated the integrative assessment process. The outcome of the study has resulted in a programmatic assessment plan embedded across the CAFS curriculum which can serve as a model for transforming agriculture education programs.

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Comparing Student Learning Styles and Learning Outcomes in an Online Distance Learning Class and an Equivalent On-Campus Class

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Kansas State University

Optimal student learning is dependent on several factors including the delivery mode for the lectures, the mode of teacher/student and student/student communication, and students preferred learning styles, study skills, personality traits and personal goals. The overall objective of this study was to compare the student learning styles and learning outcomes of an online class with an equivalent on-campus class (GRSC 602 Cereal Chemistry). Entire on-campus students taking GRSC 602 in Fall 2013, and distance education students taking GRSC 602 in Fall 2013 and Spring 2014 were selected as the research population. The online distance students were taught according to the same course outline, used the same textbook, covered the same lecture material, and took the same tests as the equivalent on-campus students. A common set of learning objectives, competencies and performance measures were used to gather data for course assessments. Approaches and Study Skills Inventory for Students (ASSIST), Kolb's Learning Style Inventory (LSI) and Myers-Briggs Type Indicator (MBTI) personality inventory were administered for assessing

student learning preferences, study skills and personality types. Total of 19 on-campus and 10 distance-education students responded to the ASSIST, LSI and MBTI. Out of 16 personality types, the most common one for on-campus students was ESFP (n=5) followed by ESFJ (n=3) and ESTJ/ESTP (n=2). The data for distance-education student were scattered across 8 different personality types. LSI data indicated minor differences between on-campus and distance-education students preferred learning styles. Majority of students were found to be divergers (on-campus: 84%, distance: 80%), followed by accommodators (11% vs 10%) and assimilators (5% vs 10%). Student responses to ASSIST were used to calculate the group scores on each of the three scales: Deep, Strategic and Surface. Distance education students displayed slightly higher scores in deep approach (55.9 vs 54.1) and strategic approach (72.5 vs 70.5) compared to on-campus students. The most significant differences were observed in "seeking meaning" in the deep-scale, and "achieving" in the strategic-scale. While the distance-education students expressed much lower scores in "lack of purpose", their "unrelated memorization" scores were significantly higher than that of on-campus students.

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Determining the Relevance of Adopting the Context-Specific Knowledge Domains for Writing Expertise to Teach Writing in Agriculture

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Agriculture is a complex science made up of multiple industries and disciplines. Moreover, the ability to write clearly and effectively is one of several skills these industries and disciplines seek in entry-level employees. The purpose of this study was to use Dudley-Brown's theory evaluation framework to determine which conceptual model of writing would be the most relevant to teaching writing in agriculture. Beaufort's conceptual model of the five context-specific knowledge domains for writing expertise emerged as the most relevant model. Each domain of the model—discourse community knowledge, subject matter knowledge, rhetorical knowledge, genre knowledge, and writing process knowledge—is unique but overlaps to create interdependence. The model discussed writing in the real world, incorporated the transition from university coursework writing to professional business writing, represented writing within a community, and described the complex knowledge domains that successful writers must draw from during the writing process. Applying this model to

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curriculum could provide students and instructors with an understanding of how dependent writing skills are on students' knowledge of discourse community and subject matter. Additionally, adopting the model as a guide to teach writing has the potential to produce career-ready students who can understand subject matter, identify audience needs (discourse community knowledge), recognize primary communication goals (rhetorical knowledge), and identify the appropriate communication tools needed to achieve those goals (genre knowledge). Therefore, the next research step would be to evaluate the effectiveness of using the model to teach writing in agriculture.

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Performance of Incoming Freshman Students with Different Admission Statuses

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At Sam Houston State University (SHSU), incoming freshman are classified as either a first-time freshman (FTF), first-time freshman with dual credit hours from high school (FDC); or as an incoming transfer student with a freshman classification (FTT; less than 30 transfer credits). The objective of this study was to determine which of these classifications of incoming freshman were most prepared for the college level classes and investigate the relationship between GPA over the first year at SHSU and standardized entry exams (SAT and ACT). Data were collected from 20469 students at SHSU over an eight year period. First semester GPA (GPA1), second semester GPA (GPA2), SAT scores, and ACT scores were compared across the three freshman classifications using the GLM procedure in SAS. Additionally, the relationship between SAT, ACT, GPA1 and GPA2 scores were correlated using the Corr procedure in SAS. For SAT, ACT, GPA1 and GPA2 scores, the FDC students had higher ($P < 0.01$) scores than other classifications. In contrast, the FTT students had lower ($P < 0.01$) scores than the other classifications with FTF being intermediate for all scores. However, across all classifications both SAT and ACT scores were poor predictors of either first semester GPA ($r = 0.27$; $r = 0.26$, respectively) or second semester GPA ($r = 0.30$; $r = 0.29$, respectively). This data illustrates that students who, in high school, actively prepared for college outperformed those who did not in college. Conversely, those students who transferred to SHSU as freshmen were not as well prepared academically as those who began their academic career at SHSU.

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Examining How Participants Reflect Within an Adult Agricultural Leadership Program Using Schon's Strategies of Reflection-on-Action and Reflection-in-Action

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Hannah S. Carter and T. Grady Roberts
University of Florida

Adult agricultural leadership programs encourage participants to gain understanding of issues and develop leadership skills to be effective leaders for their community and industry. Leadership skills are improved through the experiential learning process which includes reflection. Studies have shown that positive outcomes result from participation in these programs, but how participants are achieving these outcomes has not been examined. By studying one component of experiential learning, reflection, we can understand how participants are utilizing program information. This study sought to understand how participants reflected on program experiences using Roberts' model of experiential learning and Schon's strategies of reflection-in-action and reflection-on-action through individual reflection activities and group reflection. Evidence of both reflection-in-action and reflection-on-action were found on both the individual and group levels of reflection. However, participants tended to reflect-on-action more than they reported reflecting-in-action. What participants reflected on and the processes utilized to reflect were different between individual and group reflections and between participants reflecting-on-action and participants reflecting-in-action. The major finding of the study was that when participants reflected in action they tended to use personal experiences when reflecting at the group level and used their others' experiences when reflecting at the individual level. This implies that when participants framed their experiences using the situations of others, they were able to better understand their own obligations and responsibilities. The social construction created by others actions, which were well known by the culture, aided the participant in constructing their own knowledge.

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Comparison of Large- and Small-Scale Biodigesters as an International Learning Tool

Robert D. Shannon* and Tammy M. Bennett
The Pennsylvania State University

This project investigated interdisciplinary student learning about international environmental and sustainability issues as a function of scale, and made comparisons between large-scale agricultural issues in the United States vs small-scale family farm issues in Costa Rica. One case study to investigate issues of scale as an interdisciplinary learning tool exposed students to a large-scale biodigester (1350 cows, \$950,000) dairy farm in Pennsylvania, USA. Methane generated by the anaerobic decomposition of dairy manure was converted to electricity by a 200 kW generator and sold to the local power company, with additional heat recovery from the generator used to supply hot water to the milking parlor and to maintain the digester temperature at 100 degrees F. Students were also introduced to the complexities of constructing a large-scale biodigester, along with the costs and regulatory issues surrounding the construction and maintenance of the facility. In contrast, students were given the opportunity to assist in the construction of a small farm biodigester in Costa Rica (<20 cows, <\$500) as part of a community-based service learning project. Students were directed by student peers from EARTH University, which has constructed several thousand biodigesters throughout Central America. This hands-on, experiential learning component of the course was used to reinforce the concepts learned in Pennsylvania, and served to emphasize both the similarities and differences between large-scale and small-scale farm practices, as well as the environmental implications of these best management practices.

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Soft Skills Run through Us: Meeting Industry Needs in Agriculture Students

Chris Morgan,* Elliot Marsh and Nick Fuhrman*
University of Georgia

With the world's population at an estimated seven billion people and growing, meeting their food and fiber needs becomes increasingly difficult. Skilled agricultural workers will be needed to meet this challenge. Not only will these agriculturalists need to have technical skills, they will need to have "soft skills" as well, including abilities in time management, public speaking, problem solving,

and critical thinking. Indeed, agricultural sector employers consistently state that new graduates struggle with these and other essential career skills. To comprehensively identify the skills needed by agricultural employers, a Delphi study asked 33 agricultural employers in Georgia, "What skills do agribusiness students need to be successful in employment?" The results revealed that half of the skills desired by employers were soft skills. However, as we look at the curriculum within our academic programs, do we purposely teach these skills? Incorporating these skills into an already crowded program of study is difficult, but there is hope. By creatively including activities that build these skills into our current syllabi, we can provide students with elevated opportunities to practice, hone, and perfect the skills employers' desire of our graduates. This presentation will present the results of the Georgia study and provide examples of how current assignments can be modified to incorporate soft skills development.

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The Impact of Supplemental Recorded Lectures on Student Satisfaction, Attendance, and Performance

Caroline Glagola Dunn,* Brian Myers, David C. Diehl and Karla P. Shelnett
University of Florida

Anecdotal evidence indicates that faculty believes recorded lectures made available to students affect attendance. The purpose of this study was to evaluate the impact of recorded lectures on student satisfaction, attendance, and performance in a senior level nutrition science course. The instructor utilized existing classroom technology to record lectures and made them available through the online learning portal immediately after class. As part of course evaluation, students (n = 47) completed anonymous surveys at mid-point and semester end. Ninety-one percent and 97% of students reported having used the videos and ranked their usefulness as 5.02 and 5.17 out of 6, respectively. Students reported utilizing recorded lectures (at semester midpoint and end, respectively) to review material missed in class (100%, 68%), to review difficult material (91%, 68%), to study for quizzes (73%, 79%), to study for tests (64%, 79%), and to actively listen in class and take notes using videos (64%, 37%). Only one student reported using the videos so they could skip class. Average attendance calculated based on seven randomly selected days during fall 2013 was 84.5% compared to 82% for the same course in fall 2012. Students in the highest percentile of recorded lecture usage scored higher on exam one than those students in the lowest percentile (P = 0.032); how-

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ever, there were no differences for subsequent exams. These results suggest that making recorded lectures available is a highly accepted method of improving performance without affecting attendance in a high-level nutrition science course.

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What Does it Take to Produce “More Crop Per Drop?”: Assessing AET Systems in Jordan

Tom Hammett* and Kurt Richter*
Virginia Tech

The innovATE program, partnering faculty from Virginia Tech (VT), University of Florida (UF) and University of California at Davis, conducted a scoping study of agricultural education and training (AET) systems in Jordan to design programs that will improve agricultural water management. Average annual rainfall in Jordan is less than 10 inches. Finding crops and agricultural practices best suited to water conservation is imperative. The team conducted interviews, held focus groups, and gathered data on educational programs, curricula and infrastructure to identify where capacity can be improved and expanded. Primary data collection consisted of interviews with various AET stakeholders during a scoping assessment held in Fall 2013. These conversations were held with staff from governmental agencies and non-government organizations, agriculture students, and faculty members at agricultural institutions to acquire existing views and information regarding AET in Jordan. Observations and results will be presented focusing on water saving agricultural (WSA) activities recognizing institutional and industry demands on human resources, building competencies for training and specialization and gaps in workforce development. The team assessment of AET systems focuses on extension and advisory programs, closer collaboration with private sector employers, the need for a higher level of gender equity and expansion of knowledge and skills transfer. Positive institutional change and the pursuit of growing “more crop per drop” hinge on building stakeholder capacity. By expanding capacity for WSA education and training, Jordan can set an example for an increasing number of countries experiencing water shortages in the face of a shifting climate.

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Impacts of the Bioenergy Summer Bridge to College Program at Oregon State University

Adam C. Talamantes,* Ryan Collay, Jenny de la Hoz, Renee O’Neil, Micki Halsey Randall, Laia Robichaux, Darlene Russ-Eft, Jay Well and Katharine G. Field
Oregon State University

Oregon State University’s Bioenergy Summer Bridge to College Program (referred to as BRIDGE) aims to increase retention and graduation rates of first generation college students who come from underserved communities and backgrounds which are either rural, of low socioeconomic standing, or ethnic minorities. Part of a USDA-funded comprehensive bioenergy education program, the BRIDGE combines a Bioenergy-based academic curriculum with activities to connect students to campus resources. Activities range from an intensive bioenergy research project to a resource scavenger hunt and skills-focused outdoor activities. During the BRIDGE students gain a specific understanding of the challenges of college life and the resources that will help them succeed, while developing a supportive academic community. At the culmination of the BRIDGE students present their bioenergy research projects to their parents to showcase not only what they have learned, but also that they are ready for the rigors of college life. The pre-post BRIDGE assessment surveys conducted by an evaluation team indicate that students had significant gains in skills that have been linked to academic success, such as time management, goal setting, and maintaining positive self-outlook. Furthermore, in a separate six-month post BRIDGE survey, students reported that the experience and skills acquired in the program have played a role in their current academic success.

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The Cognitive Level of Online Class Discussions

Sara B. Brierton,* Elizabeth B. Wilson, Mark J. Kistler, David W.W. Jones and Jim Flowers
North Carolina State University

This presentation explores the cognitive structure of online class discussions via an experiment to reveal the Bloom’s cognitive level of discussion comments. Online class discussion can be asynchronous or synchronous; in this case, both were used and the resulting distributions compared. This study utilized an experimental research design, the independent variable is

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a/synchronous and the dependent variable is cognitive level. Participants were from the same graduate class and were randomly assigned to either group. All students were provided weekly course content online. Content related discussion questions were available to the asynchronous group and students had several days to craft their comments. The synchronous group did not have access until chat time and then provided their responses in real time. Transcripts of all discussion were analyzed against Bloom's Taxonomy and each comment was tallied at the appropriate level. Discussion over the entire semester was expressed by percentage of comments at each level. In asynchronous discussions the percentages were: 10 knowledge, 37 comprehension, 22 application, 25 analysis, 6 synthesis, and 0 evaluation. In synchronous discussions the percentages were: 51 knowledge, 42 comprehension, 6 application, 0 analysis, 1 synthesis, and 0 evaluation. While there is little prior research to suggest one distribution is better, if the goal of discussion is higher levels of thinking, asynchronous appears preferable. Comprehension, however, was more evident in synchronous. Course objectives might best indicate which format to use. Regardless of strategy, providing students with real-world content, prompts for open discussion, social interaction opportunities, and chances for reflection results in productive discussion.

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Litton Leadership Scholars

Jon C. Simonsen
University of Missouri

Developing the next generation of leaders is one of the many roles that higher education plays in society. Based on this responsibility, many college campuses are increasing the number of leadership opportunities available to students. The idea for the Litton Leadership Scholars (LLS) program was conceived in 2011. The overarching objective based on the idea was to develop a premier leadership academy for undergraduate students that would meet the unique needs of the scholars while adhering to the Jerry Litton Family Memorial Foundation mission. Each year approximately 18 College of Agriculture, Food and Natural Resources sophomore level students are chosen to be a part of the program. The program includes a year-long class framed around *The Student Leadership Challenge: Five Practices for Exemplary Leaders*. Throughout the experience, scholars interact with leadership, agriculture, and community experts. The relational aspect of the program works to develop scholars that possess the capacity to engage in individual and professional networking and mentorships. Scholars are involved in multiple activities that challenge

them to exhibit initiative, perseverance, cooperation, hard work, and a desire for leadership. These are qualities that Litton often spoke about and exemplified in his life. Students chosen are provided with a tremendous opportunity for growth and a responsibility to be productive citizens in the future. The academic and relational nature of the experience guides the scholars to become impactful change agents in the University of Missouri community and beyond while continuing to honor the legacy of Jerry Litton.

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Creatively Implementing Experiential Learning into the General Education Curriculum

Randall Violett *
Southern Utah University

The constant challenge of engaging students in general education courses has many obstacles to overcome such as, limited or no laboratory sections, large class size, students are required to take the course, and traditional lecture/discussion format. To attempt to resolve some of these challenges the author developed a creative schedule that would allow a portion of the class to attend on different days of the week to receive hands-on learning experiences. These activity weeks required the student to attend class only once during the week at the regularly scheduled time. This allowed the instructor to divide the class into smaller sections and be able to interact with the students on a more individual basis. Four activity weeks were scheduled during the semester and all of them were comprised of some sort of hands-on learning activity outdoors. Additional assigned readings and videos were posted on a campus network to supplement the activity of the week. Students were excited about the idea of not having to come to class every day of the week and did not hesitate to complete the extra assigned work. Evaluating the effectiveness of this method the instructor found that more material was covered and students responded well to the hands-on activities. Using the IDEA center course evaluation forms students rated the course as a 3.6 on a 1-5 scale before implementing the activity week. After the activity week was implemented the following semester the student evaluations rated the course as a 4.0.

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Building Perennial Legacies on Student Farms

Field-Based Learning Workshop

Patrick Certain,* Mac Burgess, Bill Dyer, Alison Harmon and Charles Holt
Montana State University

The student-run Towne's Harvest Garden, part of Montana State University's Sustainable Food and Bioenergy Systems BS degree program, is an integral part of students' experiential learning. However, the farm focuses almost exclusively on annual vegetable production, and students have few learning opportunities relating to perennial plants and permaculture. The objective of this new project is to inspire students to envision and develop a multifunctional forest garden that includes native and domesticated fruit, mushrooms, and wood products. Management of this forest garden will help students understand the resulting ecosystem services such as floral resources for beneficial insects, windbreaks, wildlife habitat, riparian buffers, and recreational opportunities. During the summer session, students will participate in all aspects of perennial plant community establishment and care, and use social media to document their management activities and personal reflections on the roles of permaculture in establishing a 'sense of place', building a legacy that we hope will provide motivation for future students. Students will take surveys before and after participating in the summer practicum course in order to assess interest in perennial agriculture and the impacts of experiential learning environments. We hypothesize the survey will show that students appreciate the inclusion of perennial systems as an enriching component of the Towne's Harvest experience.

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Incorporation of the Doceri Interactive Whiteboard App into the Classroom

Speeding with Technology Workshop

Dan Stein* and Ranjith Ramanathan
Oklahoma State University

The interactive whiteboard incorporated into the classroom, not only enhances teaching, it supports learning. Curriculum delivered by means of an interactive whiteboard, promotes all three learning modalities: visual, auditory, and tactile/kinesthetic. Doceri is an iPad interactive whiteboard app and screencast recorder which

connects wirelessly to a laptop (Doceri Desktop program) allowing the user to move freely about the classroom and not be restricted to the whiteboard at one location. The user can access and annotate over files on the laptop or work directly from the Doceri screen using an overhead projector. New drawings or changes made during a presentation are saved automatically. An audio voice-over can be added to an entire lecture or any portion of a lecture and saved as an MP4-video. Doceri iPad also incorporates a time-based platform allowing the presenter to prepare and record a presentation in advance. The Doceri app has been relatively simple to integrate into the classroom setting. Recorded lectures have been saved and made available to the students. Also, new material has been recorded for the students to review before coming to class – utilizing Doceri in a "flipped" classroom setting. Student feedback has been positive, focusing around the idea that the recorded lectures are in synchrony with any changes made to the presentation or any added material during lecture. The MP4-videos and presentations are being utilized by the students and seem to have a positive impact on their learning, making the Doceri iPad App a functional classroom delivery system.

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The NACTA Judging Conference: Past, Present and Future Directions

Kevin J. Donnelly
Kansas State University

The annual NACTA Judging Conference provides an opportunity for an active learning experience for students. This presentation highlights the history and current status of the event as a background for discussions at the 2014 Annual Conference intended to enhance the relationship between NACTA and the NACTA Judging Conference. The judging event is hosted by a different college each April, with contests generally offered in 8-10 content areas. Required contests are livestock, dairy, soils, crops, agribusiness and knowledge bowl. Separate competitions and awards are provided for 2-year and 4-year divisions. Typical participation includes about 500 students plus coaches. A sweepstakes award, sponsored by NACTA, is presented to a school in each division based upon team rankings across multiple contests. To compete, the school must be a NACTA institutional member. Elected officers and a constitution of the NACTA Judging Conference guide contest administration. The NACTA Judging Conference Liaison provides a formal link to NACTA and reports to the NACTA Executive Committee. The idea for a judging conference developed in the early years of NACTA, with the first event

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held during the 5th NACTA annual convention at Berea College in 1959. This model was discontinued after 1962, but in 1965 some NACTA schools started a Southern Regional Livestock, Dairy and Soils Contest. It officially became the NACTA Judging Conference in 1970, and this model has continued to present day. In addition to focused discussions at the 2014 NACTA Conference, the first NACTA Judging and Student Service Award will be presented.

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An Introductory Soils Course Hat Trick: Evidence-Based Teaching, Improved Post-Test Scores, and Reduced Post-Test

A. Hartshorn, A. Johnson, P. Santibanez and A. Pandey
Montana State University

While recent reports have celebrated the joys (and importance) of teaching soil science (e.g., Hartemink et al. 2014), others have called for evaluation of how best to teach soils. Unfortunately, there are too few case studies where students have been randomly assigned to a pedagogic intervention, and student learning outcomes measured before and after that intervention. Here we report on an experiment designed to explore the effects of peer instruction on student learning outcomes. Instructional interventions were conducted in Fall 2013 as part of a large-enrollment (~180 students) sophomore-level soils course. Students were randomly assigned to either control or treatment groups, and members of both groups completed pre- and post-tests. Control subjects followed standard procedures whereas treatment subjects were responsible for teaching the subject matter and procedures to their peers. Post-test scores for both the pilot and experimental studies were significantly higher than pre-test scores ($p < 0.05$), both for control and treatment groups, implying the standard procedure improved student learning. Gains (post-test minus pre-test scores), however, were ~20% greater for treatment groups, suggesting a greater return on the minimal additional time investment (~10 minutes within a 110-minute laboratory session). We also found that the post-test score variances for treatment—but not control—groups were greatly reduced: interquartile ranges decreased by ~60%. This could be an overlooked learning outcome benefit if one of the essential elements of effective teaching is addressing student misconceptions. This research provides a template for rapid and effective education interventions that promote improved learning outcomes.

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Evaluating Student Use of Google Maps™ as a Study Resource for Plant Identification Courses

Speeding with Technology Workshop

Matthew S. Wilson and Chad T. Miller*
Kansas State University

Horticulture plant identification (ID) courses expose students to numerous plant species with an expectation to learn the information within a limited amount of time. Technological advancements have led to increased incorporation of multimedia devices in classroom curricula. We integrated the Google Maps™ web application in the Landscape Plants Identification courses at Kansas State University as a study resource for students. We conducted a survey to obtain student feedback concerning the usefulness of the Google Maps™ application as a student resource and whether it could enhance student participation and learning. A survey instrument collected student evaluation data at the end of the fall semester in 2013. The student participants of this study ($n=49$) consisted of 26 sophomores, 12 juniors, 9 seniors, and 2 graduate students. The majority of the students were horticulture majors ($n=21$), followed by landscape architecture majors ($n=20$). Results indicated that 65% of the students used Google Maps™ at least once and they accessed the online maps an average of 3.2 times per week. When asked to rank usefulness of the maps on a scale from 0 to 6 (0=not at all useful; 6=extremely useful), 67.3% of all students indicated that the Google Maps™ resource was a useful to extremely useful study aid. Our findings suggest that the Google Maps™ web application is a useful resource for students to review plant materials in plant ID courses.

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Interdisciplinary, Research-Based Bioenergy Minor at Oregon State University (OSU)

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Oregon State University

The need for sustainable alternatives to fossil fuels is a major societal problem, requiring experts capable of integrating skills from diverse fields to create innovative solutions. We developed OSU's interdisciplinary Bioenergy Minor to address this need. The program outcome will be graduates capable of cross-disciplinary problem solving and innovation, to meet current and future needs

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of biofuels, bioproducts, renewable energy and related industries. Concepts and knowledge are provided by core courses and electives. Training in skills such as cross-disciplinary collaboration, communication, research, and project management is provided by participation in a significant mentored research project, seminar and thesis, as well as interdisciplinary team activities. New courses developed for the Minor cover bioenergy feedstocks and conversion, regional energy issues, sustainability, economics, business, innovation, and policy. The minor provides financial support, research opportunities, mentoring, and professional development for students from any OSU major. Graduate assistants in education and technical fields have assisted in development and delivery of courses, evaluation and assessment tools, and surveys of national bioenergy experts from industry and academia. New classes and educational modules developed for the program are available beyond OSU through websites and eCampus. Surveys of students in the bioenergy minor were initiated at the end of the second year of the program, and are focused on the specific objectives of the program. Survey data are being used to ensure the minor is meeting the program objectives within the changing bioenergy landscape, and to help create a framework for other institutions looking to develop similar programs.

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Self-Efficacy in a Natural Resource Field Studies Course

Field-Based Learning Workshop

Christopher M. Estep* and Bonnie J. Warnock
Sul Ross State University

Research has shown declining amounts of fieldwork utilized by natural resource science instructors in higher education. In addition, undergraduate students enrolling in natural resource management (NRM) programs increasingly possess little field experience. These factors are problematic as fieldwork is an integral part of developing professionally in NRM. This study was guided by social cognitive theory, more specifically self-efficacy. Self-efficacy is defined as an individual's perception of their ability to perform a certain task. Moreover, self-efficacy is an important predictor of performance, persistence, effort, achievement, and choice of tasks, and is heavily influenced by past accomplishments and failures. Therefore, theoretically, instructors and students who lack NRM field experience should exhibit lower self-efficacy for fieldwork tasks. The purpose of this study was to determine participants' perceptions of self-efficacy for natural resource field activities before and

after a natural resource field studies course. This census study included students and faculty enrolled in week-long NRM field studies course during the summer of 2013 (N = 13). A researcher created instrument measured self-efficacy on a 5 point Likert-type scale for 33 items related to the course activities. The pre-test was administered on day one and the post-test on the last day. Results of the pre-test showed that group dynamics, physical demands, and camping were areas of high efficaciousness while first aid, navigation, collecting field data, and identifying hazards were low. Post-test results were similar, however, efficacy increased for navigation. Recommendations for future classes are to focus more on first aid procedures and identifying hazards.

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How Does Learning Run through Collaborative Groups?

Wendy J. Warner and Meghan M. Wood
North Carolina State University

At last year's NACTA conference, Dr. Gary Moore gave a presentation on the success of small groups in an undergraduate course. We know he was pleased with the results, but what did the students think? Did they want to engage in collaborative efforts? What did they value in members of their group? Following Dr. Moore's recommendations, small groups were once again implemented in the same course (with a different instructor). At the conclusion of the first and second collaborative project, students were given the opportunity to decide if the class should continue with a collaborative project or revert to an individual project. There was overwhelming support for the continuation of collaborative projects. Students provided several different reasons as to why group collaboration should continue. Several students felt they learned more effectively and leaned more when engaged in a group. Additionally, students indicated their group worked well together and group members had the opportunity to contribute individual strengths to the overall project. Students had the chance to provide evaluations for the members of their collaborative groups and there were certain characteristics that were recognized in quality group members. This presentation will provide a more extensive analysis of students' opinions on collaborative projects and feedback provided through the peer review process.

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Teachers Connecting, Learning and Networking Online using Social Media

David W.W. Jones* and Wendy Warner
North Carolina State University

Jennifer Jones
Hello Literacy, Inc.

Face to face workshops, conferences and whole group professional development are great, and often give teachers the “shot in the arm” they need to go back to campus feeling inspired and armed with new tools and resources. But what happens when the inspiration wears off, and you have no one to bounce your new ideas off of? Social media takes over where conferences leave off. In addition, social media is the token economy of every college student. Participants will learn how using social media sites like Twitter, Blogger, Pinterest, Instagram, Vine, TeachersPayTeachers, Facebook, Remind101, Todays Meet, and LinkedIn, create real-time, real-life professional development and bring the world into your classroom. Learn the power of following others with similar research interests as you, and how you can have an impact and make a difference in those individuals that follow you. Learn how hashtags, edchats and webinars are tools that can be used on your schedule, when professional development works best for you. Learn the basics and benefits of each social media site and how each one has potential to enhance your teaching and impact the learning and lives of your students.

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Infusing Learning into a Campus Recruiting Event

L.A. Wolfskill,* Foy D. Mills, Jr. and John T. Mann II
Sam Houston State University

Most on-campus recruiting events aim to generate interest in attending the university and majoring in a particular program by showing students the campus and facilities, and perhaps a variety of experiences that a typical college student might encounter. As part of an interest-generating field day for high school agriscience students, the agribusiness program area at a regional southern university held a futures trading educational experience. The primary goal of the experience was not only to expose students to departmental resources and college life, but also to actually teach them in the process. For the trading game, students worked in pairs buying and

selling futures contracts using an open-outcry, pit-based system. The learning game was run in two 75-minute sessions, with approximately half of the students at each session. The students also experienced campus tours, a dining facility, and other student life activities. A pre-post survey measured changes in knowledge of how markets worked, as well as attitudes toward majoring in agribusiness and attending the university after graduation. Key research questions revolved around whether learning occurred, and if attitudes were altered through the experience. Engagement was measured by rate of trades students completed. T-tests revealed that students' familiarity with futures markets increased, and they were more likely to answer basic market questions correctly after the game. Using logistic regression, researchers showed that upperclassmen were more interested in attending the university than lowerclassmen. Additionally, it indicated that some variables were significantly affected by the events of the day.

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Enhancing Laboratory Awareness with Snapchat

Speeding with Technology Workshop

O.P. McCubbins,* Ryan Anderson and Trent Wells
Iowa State University

Safety is a priority in the agricultural laboratory environment. Post-secondary agricultural educators must be competent in laboratory management practices to ensure technical competence is gained by their students. They must also promote high quality, safe practices. The purpose of this study was increase the laboratory awareness of students in an agricultural mechanics teaching methods course at Iowa State University. The researchers desired an engaging method to create awareness and highlight safety concerns within a laboratory setting. Snapchat, a popular social media platform, is an application that allows users to take a picture or video and share it with friends, or as a story on their personal page. Individual pictures and videos shared with friends expire based on a timer set by the user, whereas pictures and videos included in a ‘story’ are viewable for 24 hours. These images and video can be saved into a gallery on a smartphone/ tablet. This innovative teaching method was field tested in the spring of 2014. The instructor and teaching assistant looked for any safety violations being committed by the students as well as staging potentially hazardous situations for students to recognize. A picture or video was taken of these violations and shared on the instructors ‘story’ for the students to view. Students (n=14) were then required to respond

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and identify the safety violations or potential safety concerns. Students' only complaints regarding this field test was pertaining to the screen size of their smartphone, and that it was sometimes difficult to view the pictures.

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Internationalization of Programming at New Mexico State University

Joshua O'Halloran and Brenda Seevers*
New Mexico State University

As globalization has increased, agricultural faculties have been encouraged to internationalize their programming efforts. The purpose of this study was to assess the attitudes of agricultural faculty at New Mexico State University towards globalizing their programming efforts. Current international programming efforts and barriers to participating in these efforts were also assessed. The survey instrument contained four sections, which included demographic information, current involvement in international activities, attitudes towards international issues, and barriers towards internationalizing programming efforts. The frame for this survey consisted of all agricultural faculty in the college of Agriculture Consumer and Environmental Science, including Extension and Experiment Station faculty (N = 231). One hundred and twenty-five responses were considered usable. The results showed that 85% of the respondents were involved in international activities within the past ten years. Many, however, have not participated in these activities within the past year indicating that it is not an ongoing component of their work. The mean attitude score of NMSU faculty towards global issues was 2.93 in a scale from one to four, with four being the most positive. Teaching faculty and faculty over the age of 50 reported more participation in international activities and a more positive attitude toward international issues than their colleagues. The primary barriers towards globalizing programming efforts were "Lack of Financial Support," "Lack of Time," and "Not a Programming Priority." These results were consistent with the attitude section, which showed that respondents did not consider it a priority that was rewarded or communicated effectively.

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Sustainability Matters: A Review of Student Knowledge and Awareness

Jessica England, Morgan Large, Leslie D. Edgar, Jefferson Davis Miller
University of Arkansas

Universities can foster sustainable growth globally in a number of ways, including "green" facility development, awareness programs, sustainability courses, and degree programs focused on sustainability. The key to facilitating more sustainable campuses is student initiative. To measure this initiative and foster it, student perceptions of sustainability must be described and gauged. At the University of Arkansas several sustainable projects have been undertaken, coordinated in part by the campus Office for Sustainability. This study assessed incoming and current students' perceptions and awareness of the Office for Sustainability and sustainability efforts at the University of Arkansas to provide a foundation for improving educational and communication activities on campus. Employing survey methodology with 2,969 students in 19 courses, this study described (1) students' perceptions of sustainability efforts at the University of Arkansas; (2) students' sustainability behaviors; and (3) students' preferred methods to receive sustainability-based information. Students' awareness of campus efforts was low, while their evaluation of the importance of sustainability was high. Additionally, students claimed to be practicing personal sustainability practices, yet careers related to sustainability and courses focused on sustainability were not profoundly popular among students. Recommendations for the University of Arkansas include increasing campus communications promoting careers and academic courses or degree programs in this field. Further opportunities for similar research exist on other campuses and with other campus audience groups, including administration, faculty, staff, and campus vendors. These findings will assist other universities with course and programming development in sustainability.

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Arkansas Cooperative Extension Service and Higher Education Personnel Perceptions of Web-Based Technology Training and Dissemination

Hayley G. Jernigan, Julie C. Robinson and Leslie D. Edgar
University of Arkansas

Implementation of distance learning has continued to grow in higher education. Post-secondary education faculty at the University of Arkansas collaborated with the Arkansas Cooperative Extension Service to implement technology and professional development training via distance education. Perceptions of learning via distance education were assessed using post-lesson surveys.

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Extension personnel participated in a lesson covering an orientation to a newly implemented web development platform. The convenience of learning via distance education was a strong factor in participant satisfaction, which was consistent with in-service training research. Participants were willing to learn via distance education, but did not show high interest in using distance education to teach their target audiences. However, research showed the importance of technical expertise training for post-secondary education personnel. Despite their unwillingness to teach via distance education, 53% of participants rated themselves as “Intermediate” (will try most technology but not proficient in some), 25% as “Advanced” (will try most technology and proficient in most), and 16% as “Expert (knowledgeable and people come to me for assistance). Efforts should be made to provide professional development and technology-based training via distance learning for higher education personnel to improve program effectiveness, expansion, and educational reach. Some participants noted a lack of knowledge of the newly implemented web development platform, but expressed a willingness to learn. Further research should be conducted to determine if initial perceptions of learning via distance education could have been effected by participant perceptions of the web development platform. Lessons learned should be shared with post-secondary educators.

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Students’ Perceptions of Using a Course Management System to Supplement Face-to-Face Advising

Kelsey Hall and Taylor Adams
Utah State University

Universities are determining the appropriate tools needed to provide for students’ advising needs. A few universities have adapted their course management systems (CMS) to serve as an advising tool. Little to no research has explored students’ experiences with using a CMS for supplementing face-to-face advising. This study used focus group methodology to discover students’ perceptions and experiences with using Canvas, a CMS, as an advising tool to supplement their face-to-face advising at a land-grant university. Student researchers under the supervision of a faculty mentor conducted eight focus groups. The 40 participants represented every college department and have used the Canvas advising tool for two semesters. Several participants indicated that students were unaware of Canvas’s advising features, thinking the tool was used primarily to send notifications and respond to students’ e-mail messages. Some participants liked the idea of the Canvas advising tool because

it was convenient and could be more efficient in getting accurate information any time. Participants enjoyed receiving information about club activities, internships, and important deadlines for their academic program. Participants requested fewer notifications that were more tailored to their academic major, such as reminders about class scheduling, scholarships, and career fairs. Furthermore, participants requested more resources, such as online scheduling for advisor meetings, online degree plans, a discussion board, and student forum. These findings offer useful information for how faculty and advisors can use their university’s or college’s existing CMS to interact with students and helping students make more informed academic and professional career decisions.

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Learning by Pinning: Assessing Higher Level Thinking through Pinterest

Speeding with Technology Workshop

Kelsey Hall
Utah State University

One learning outcome of higher education is students’ ability to critically think; however, research has discovered that agriculture students have insufficient ability to think critically. One suggestion for how to incorporate critical thinking into courses is to have students use social media tools, such as blogs, YouTube, Facebook, wikis, and Twitter, to communicate about course topics. Few studies have discovered how students could use Pinterest, a social media tool for sharing pictures and video clustered together by topic, to apply and assess what they are learning. The purpose of this study was to assess students’ ability to achieve higher-order thinking through their use of Pinterest. Students enrolled in an agricultural communications course learned the principles of design for creating promotional pieces through reading assignments and lectures. Afterwards, students created a Pinterest account to complete two assignments. For the first assignment, students pinned 10 logos, and students pinned 15 brochures, newsletters, or fliers for the second assignment. With each pin, students had to note the designer and write a reflective comment evaluating how the example violated or followed one or more principles of design learned in class. Data were gathered from 450 pins, and analyses of students’ reflective comments showed that the majority of students could use Pinterest to connect learned information to real life examples. Several students suggested how they would change the promotional item or use an element of the item for their own design project. Further research

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will discover the students' perceptions of using Pinterest in the classroom.

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Instruction for Change: Creativity, Data, & Whole Systems

Rebecca Bott
South Dakota State University

Matt Spindler and Rebecca Splan
Virginia Tech

Christine Skelly
Michigan State

Kathleen Anderson
University of Nebraska

There is growing urgency for academic reform among agricultural colleges within higher education. The escalating rate of global change has created mounting pressure to solve complex societal challenges linked to the world's food, energy and environmental resources. These solutions require whole system approaches, multidisciplinary data collection and creativity. New, cross-cutting learning programs are needed which promote systems approaches, scientific inquiry, creative and critical thinking, discovery-based problem solving, leadership, and communication skills, all in a manner that challenges students to make connections across disciplines. To explore the extent to which the aforementioned ideas are integrated into instructional practice within agricultural disciplines, project collaborators carried out a descriptive survey study to create information about the agricultural course experiences of students at four different land grant universities. The findings indicate that: 1) a majority (68%) of the 362 participants were majoring in an agricultural discipline; and 2) slightly more females participated (56%) in the study. The findings reveal that for a significant majority of students, thinking creatively, whole systems approaches, and interactive problem solving were seldom part of their course experiences. The findings also illustrate that most of the students did not have frequent opportunities to address authentic challenges, learn through experiential means, or relate their learning to research or external project ideas. It is recommended that teaching faculty and instructors work with agricultural education specialists to improve the design and implementation of instructional experiences that focus on exercising creativity, collaborating effectively, utilizing real data, and recognizing how components interact within whole systems.

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Agricultural Literacy and Student Policy Preferences

Kyle W. Ferrell, Ashley Stephens, Foy D. Mills, Jr., Mark Anderson and Jessica Francis
Sam Houston State University

Political gridlock caused by opposing policy views was recently observed in a two year delay before final passage of the 2014 Farm Bill. Though the delay is attributable to a number of factors, how much of the interruption was due to varying levels of agricultural literacy among stakeholders? As future agricultural leaders enter and complete a university education, how agriculturally literate are these students and does literacy impact their views towards farm policy? Students enrolled in an introductory agricultural sciences course and students enrolled in an upper-division agricultural policy course at a large regional public university were selected for comparison. Agricultural literacy was measured by the National Food and Fiber Systems Literacy exam (FFSL). Student policy preferences were captured from a survey originally developed to determine taxpayer preferences for various programs supported by the USDA. Students were asked to identify the most important role of USDA. Students were randomly assigned to two treatment groups, one with and one without USDA budget information. Students were asked to allocate \$100 across six major USDA budget categories. The study found that advanced students scored significantly higher ($P < .05$) on the FFSL. However, no significant difference was found between the two student groups regarding the most important role of USDA or how the groups allocated dollars across the USDA budget categories. Conversely, students with and without information allocated dollars differently to Farm Support ($P = .05$), Food Assistance ($P < .01$), and Food Safety and Inspection ($P < .01$). Therefore, among these students, agricultural literacy did not impact agricultural policy preferences.

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Educational Impact of Student-Developed Material for Animal Science

Heather Dunn, Brian Bolt, Johanna Johnson and Cynthia Deaton
Clemson University

In an effort to enhance student learning in Animal Science, this study measured the educational impact of the student developed Ruminant Anatomy: A Photo Atlas as

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supplemental instructional material. Impact was assessed during the fall 2013 semester in the freshman level course titled "AVS 1500: Introduction to Animal Science" at Clemson University. The text *Ruminant Anatomy: A Photo Atlas* is a full-color 209 page photographic atlas including diagrams, histological images and labeled photographs developed over eight months with Animal & Veterinary Science undergraduates. The objective of this study was to determine if the introduction of this student developed material could enhance student learning, comprehension and interest in large animal science. Seven assessments were administered during the semester to a total of 168 students enrolled in two sections of AVS 1500. On average, 109 of the 168 students completed each assessment resulting in a 65% response rate. Surveys included both qualitative and quantitative items, were administered pre- and post-intervention, and measured impact on student interest in course concepts, book quality, ease and frequency of use and relevance of material. Preliminary quantitative data analysis demonstrates that greater than 85% of respondents rated both importance of text activities for learning and the text's ability to facilitate interest in the concepts as either good or excellent. Qualitative trends suggest that students found the text particularly relevant for the anatomy portion of AVS 1500, relevant for other Animal Science courses, helpful for understanding the material and studying, and appropriate due to the student-focused approach.

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Poster Presentations

001

Students, Sprinklers and Pipes: A Research Methodology Practicum

Kiumars Zarafshani, Bahman Farhadi, Amirian Sohayla, Maneshti Mohammad-javad, Azizi Mohammad and Pirmoradi Amir Hossien
Razi University

Maleki Farzad
Tarbiat Modares University

Moazeni Mohammad-Rasoul
Gilan University

Students in College of Agriculture at Razi University are continuously criticizing delivering mode of college courses. Students are asking for and demanding more hands-on experiences. A member of faculty in Water Engineering Department at Razi University responded to this need through practicum course. Practicum courses have the capacity to bridge the gap between knowledge gained in a classroom and application in the world of work. Students in the Department of Water Engineering at Razi University enroll in two credit hours of Designing Pressurized Irrigation Systems as a part of their curriculum (one credit theory and one practice). For the past few semesters, this course was mainly delivered as a theory with limited attention to the practice. During spring semester 2011, a faculty member and a class of undergraduate students conceptualized the practice part as Practicum. The purpose of the practicum was to engage students in scientific research; including, conducting a literature review, designing the most appropriate sprinkler system for a small scale in College of Agriculture campus, implementing the system, and evaluate the efficiency of sprinkler system. Student responses to the experience were positive. They appeared to enjoy working in the field. Students perceived the value of well-organized experiences that made other college professors aware of their experiential mentality.

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Seeing is Believing: The Impact of Inter-Island Tours in Agriculture Education in Hawaii

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Christopher Jacobsen
Hawaii Community College

College-level academic tours are important for students' education and faculty collaboration. Students interested in tropical agriculture can supplement their education with experience in plant bioscience and production agriculture through tours to colleges and farms in different Hawaiian Islands such as Kauai, Oahu and Big Island. Thus, an academic tour of fifteen students enrolled in Plant Biology and Tropical Agriculture (PBT) program at Kauai Community College (CC) (Kauai) to Leeward CC (Oahu) was organized in Spring 2013 (Spring-tour). Similar academic tour for another group of fifteen Kauai CC students to Hawaii CC (Big-island) was organized in Fall 2013 (Fall-tour). In the Spring-tour, students were involved in DNA extraction, Shade House grown plants observation, Hawaiian plants identification and field grown near-isogenic corn lines comparison. The Fall-tour was focused on showing of methods of mushroom cultivation, field and greenhouse-based crop and vegetable production, flower and pot-plant production, aquaponics, student research, and the low cost greenhouse construction. The participation of native Hawaiian student was 20% in the Spring-tour and 33% in the Fall-tour. Ninety-three percent Spring-tour's and 87% Fall-tour's participants responded that they have learned DNA extraction method as well as overall plant bioscience, and production agriculture, respectively from the tour. As an impact of both tours, students' enrolment in PBT program at Kauai CC had formed a college level agriculture students' club. It is suggested to include inter-island tours in agriculture course curriculums in Hawaii through inter college faculty collaborations.

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003

Pre-Course Agriculture & Turf Equipment Operations Experience of University Students

Edward A. Franklin
University of Arizona

Agriculture technology and education students at the University of Arizona complete a course of agriculture and turf equipment operation skills and management as part of their technical agriculture course requirement. Historically, the typical student enrolled in this course lived on a farm or ranch, came from a production agriculture background, was engaged in FFA or a 4-H program, and was skilled in many areas of the course curriculum. Does this student profile exist today? The objectives of this presentation is to reveal findings of a pre-course survey of students to determine their perceived pre-course experiences related to the operations of tractors, forklifts, utility carts, two-stroke engines, four-stroke small engines, and diesel engines. Due to the hands-on nature and facility limitations, the maximum number of students enrolled in this course is 24. On the first day of class, twenty-three (N=23) students were invited to complete the online pre-course survey. All 23 students (100%) completed the survey. Findings reveal the majority of students have minimal or no previous experience with operating wheel tractors (none, 44%), crawler tractors (none, 61%), utility carts (none, 44%), calibrating field equipment (none, 57%), riding turf mowers (none, 48%), operating a forklift (none, 70%), operating two-stroke engine powered equipment (minimal, 44%), and previous experience with diesel engines (none, 52%). Previous agricultural education experience included FFA membership (34%), 4-H membership (30%), high school agriculture courses (48%), and community college agriculture courses (22%). Two students indicated having a family farm experience. Findings provide direction for designing hands-on experiences to provide for career preparation.

004

Dividing the Work, Doubling the Experience: The Development of a Study Away Experience between Two Universities

Courtney Meyers*
Texas Tech University

Shannon Arnold*
Montana State University

Study away experiences are very positive and effective learning opportunities for college students. However, organizing these types of experiential learning experiences can be daunting. This presentation discusses how colleagues at two universities partnered to organize a week-long study experience to Washington, D.C. for 22 students in agricultural communications and extension. The objectives of this presentation are to discuss the benefits and challenges of partnering with another university to provide a collaborative learning experience. The presenters will share their experience and advice. The key findings were: The professors collaborated to develop the course syllabus, assignments, rubrics, schedule of meetings, guidelines, and more – thereby improving the rigor of the course and subsequent experience. Having two universities involved allowed for the use of resources and connections at each institution. Taking students from both universities lowered the costs for all involved. Students said they learned a great deal from being on the trip with students from another university: “I think it was a beneficial learning experience to bring the two groups together. Not only did we get to learn from the organizations, but we were also able to discuss issues with other young agriculturalists.” Recommendations included more student preparation on current issues, a service learning project, smaller teams, additional free time, a stricter selection process, and informing the organizations about students. Based on student feedback and professors’ evaluations, this collaborative educational experience will be offered again. This presentation will provide advice for others who want to partner to create innovative study experience for students.

005

Improving Written Communication Skills through Service Based Learning

Scott L. Schaake,* Teresa L. Douthit and Mishelle R. Hay McCamant
Kansas State University

Developing skills for critical thinking and written communication are essential to the success of students who enter a career after (upon) graduation. Potential employers encourage undergraduate students to engage in activities and courses to better improve these skills and enhance career opportunities. One possible avenue to achieve this is to involve students with a faculty mentor to construct and develop an instructive teaching publication for youth exhibitors and their parents that is circulated through the Kansas State University Research and Extension program. Student authors are able to use a combination of personal knowledge from their own 4-H

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or FFA member experience, knowledge garnered in the college classroom and industry guidelines to assist in the development of the publication. Such publications, for example, would include a selection guide for the market steer project, breeding heifer project, and beef showmanship. Also similar publications involving other species such as sheep, horse, swine, and goat selection and showmanship have been or are being developed. Each publication is reviewed by peers who are members of the communication program at Kansas State and a faculty mentor. Student authors are able to receive college credit for this experience and are graded based on content, grammar, sentence structure, organization of material, and ability to meet deadlines. The faculty mentors concluded that students not only showed an improvement in written communication skills, but the project provided students with a service-based learning opportunity.

006

Building a Rain Garden: Working with Multiple Stakeholders in Academic Service-Learning

Jennifer D. W. Britton
Montana State University

With colleges and universities increasing their commitment to foster collaborative, service-learning opportunities it is crucial agriculture curriculum, specifically pedagogy in landscape design/architecture, apply “real-life” projects in student education; yet realities of permitted construction pose considerable obstacles in successful implementation within a school term. In an effort to overcome this dilemma this investigation focuses on one case study, the design and construction of a green infrastructure pilot project at a new campus facility. As a collaborative effort between faculty, staff and students from Montana State University’s Environmental Horticulture program and Montana State University’s department of Facilities, Planning, Design & Construction (FPDC), the shared program goals were to 1) undertake a design/build service-learning assignment, and 2) create a demonstration rain garden that protects and maintains local water quality in compliance with the National Pollutant Discharge Elimination Systems (NPDES) program and Municipal Separate Storm Sewer System (MS4’s) permit regulations. In light of the partnership’s positive outcome with recognition from Montana’s Department of Environmental Quality as a successful demonstration of responsible storm water management, this presentation outlines the teaching approach, challenges, accomplishments, and lessons learned in approaching the design review process, implementation and maintenance.

007

Bringing the Beef Cattle Industry to the Classroom: An Experiential Learning Opportunity in Animal Science

David A. Nichols, Angela C. Vesco, Twig T. Marston and
Mishelle R. Hay McCammant
Kansas State University

Animal Sciences and Industry students, at Kansas State University, consistently gave feedback in senior exit interviews that though they liked the science based beef cattle courses, they wanted the department to offer a direct experience course that is focused on the beef industry. Faculty assessment of the undergraduate curriculum concurred with student feedback that students with a desire to work in the beef cattle industry needed more experiential learning opportunities within the beef industry prior to graduation. The course was then developed and structured with one hour of seminar a week and five hours of field experience a week. The course focuses on the beef industry from conception to consumption including allied industries. Guest speakers are brought in during the seminar time to discuss financial management, generational transition, branded beef programs, herd health, feedlot health and economic outlook. Weekly field experiences include tours within Kansas and Nebraska to commercial cow/calf operations, seed-stock operations, stocker operations, feedlots, packing plants, animal health suppliers, food service and trade organizations. Students are then required to submit a final project which requires them to create a business plan for a beef cattle operation of their choice. The course has been successfully taught each Spring semester for the last seven years. High enthusiasm and class participation indicate students are engaged and want to be in the class. End of semester evaluations reflect high approval in course content and final projects for the course indicate a strong understanding of the industry.

008

Determining Satisfaction of Graduate Students in College of Agriculture towards their Graduate Advisors

Kiumars Zarafshani and Fateme Sasani
Razi University, Iran

For post-secondary students to excel in academic achievement, academic advising is very imperative. Uni-

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versities are mandated to provide students' needs in academic advising. Studies show that students are not satisfied with the performance of their advisors. The purpose of this descriptive correlational study was to determine the performance of graduate advisors in College of Agriculture at Razi University. Using Krejcie and Morgan table of sample size, 171 graduate students across different discipline participate in this study. Stratified random sampling technique was used to select the participants. Data was collected using researcher-made questionnaire. The research instrument was tested for validity and reliability. Results indicated that students were generally satisfied with the performance of their advisors. The students were most satisfied across Animal Science and Agronomy departments while Irrigation and Plant Pathology departments were least satisfied. Moreover, students were most satisfied with academic competence of their graduate advisor and least satisfied with advisors' interrelation with their students. The result of this study has implications for agricultural higher education. First, training courses for advisors in areas of human relations is suggested. Finally mentoring program is suggested for younger advisors.

010

Using Constructive Alignment for Course Goals, Learning Objectives, and Assignments to Create Teaching Efficiency and Achieve Concrete Learning Gains

Ann Marie VanDerZanden
Iowa State University

Well-defined course goals and learning objectives should be the underpinnings for developing a new course or redesigning an existing course. Based on the course goals and specific learning objectives, course assignments, assessments, and evaluation approaches can be developed. Further, appropriate teaching strategies can then be identified and implemented to support the assignments and assessments. When this type of constructive alignment is employed in course development, the course becomes a cohesive whole and students will have suitable opportunities to demonstrate their mastery of course content. In 2012 the syllabus for Horticulture 481, Advanced Garden Composition at Iowa State University was redesigned to align all of the course components. As a result of this careful realignment, numerous changes were made to the types of assignments and assessments used in the course, and new teaching strategies were implemented to facilitate student learning. Student feedback through mid-semester formative evaluation and end of semester teaching evaluations in

2012 and 2013 showed a positive correlation between many of these changes and student satisfaction with the course. Specific examples of constructive alignment and the individual learning gains reported by students will be discussed.

011

Recent Experiences with Forestry Master's Fellowships Designed for Underrepresented Groups

Pete Bettinger* and Jacek Siry
University of Georgia

The School of Forestry and Natural Resources at the University of Georgia received two fellowship and training grants in 2012 to support the career goals of underrepresented groups in forestry. The objective of this presentation is to describe the outreach process used to attract applicants, the selection process, the qualifications and demographics of the selected Fellows, and their progress and accomplishment within the fellowship and training program. Outreach efforts were aimed at southern natural resource programs, 1890 land-grant universities, and natural resource professional organizations, and involved several different media. Each selected Fellow represented one or more characteristics of underrepresented groups in the forestry profession. Fellows within this program have been given opportunities to become leaders in the forestry profession by delivering oral presentations at national conferences, moderating technical sessions at regional conferences, networking with corporate and governmental leaders, developing content for extension programs, and acquiring an advanced degree at one of the South's most highly perceived forestry programs. While the program has recorded a number of successes, expected levels of academic and professional performance have periodically been challenged due to a number of issues. While it is hoped that the fellowship and training program will be successful in advancing the career aspirations of underrepresented groups in forestry, more time is necessary to measure the overall success of the program. One Fellow has recently begun working as a forester for the Georgia Forestry Commission, and the other has accepted a second summer internship with Weyerhaeuser.

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012

Evaluation of Motivation of Curriculum for Agricultural Science Education (CASE) Lead and Master Teachers

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Curriculum for Agricultural Science Education

Rebekah B. Epps*
University of Kentucky

Curriculum for Agricultural Science Education™ (CASE) is an instructional system of support that provides professional development, curriculum, and assessments to agricultural educators. Through the CASE model, two CASE Lead or Master Teachers facilitate professional development, known as a CASE Institute. CASE Lead and Master Teachers are nominated and apply to participate in the Lead Teacher Program, which offers twenty hours of professional development in andragogy, delivering CASE Institute programming, and teaching strategies. The purpose of this study was to assess the learning outcomes of the CASE Lead and Master Teacher Program, specifically the motivation factors related to professional development. This study utilized pre and post-test surveys to describe the motivation for CASE certified teachers. Data were collected based on a study by Mergener and included seven motivation factors: Competency-Related Curiosity, Interpersonal Relations, Agricultural Education Professional Service, Escape from Routine, Professional Advancement, Compliance with External Influence, and Finances. The survey statements based on these factors including mean, standard deviation, and number of responses (N) during the pre-Lead Teacher Orientation pre-test and the post Lead Teacher Orientation post-test. Of the seven motivation factors, participants indicated through the surveys that the strongest influence in their participation in this program was Agricultural Education Professional Service (mean=3.9532 and 3.9500), followed by Competency-Related Curiosity (mean=3.6277 and 3.7188), Professional Advancement (mean=3.1702 and 2.8917), and Interpersonal Relations (mean=3.0638 and 3.0429). The least influential of the seven factors were Compliance with External Influence (mean=2.0691 and 2.0375), Escape from Routine (mean=2.2468 and 2.1400), and Finances (mean=2.7074 and 2.6400).

013

Teaching a Class: Contemporary Issues in Global Food and Agricultural Systems

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Kansas State University

The Department of Agricultural Economics at Kansas State University has developed a course to improve our largely rural and production agriculture focused undergraduate students understanding of the breadth of opportunities and challenges facing U.S. and global food systems. In the process of developing the class we found that it is unique to agricultural economics curriculums in the U.S. This poster will display how and why the course topics are presented. The course is a survey of contemporary economic issues affecting U.S. and world agricultural systems. These include, but are not limited to, demand and supply market issues, food production and processing, population growth, poverty, trade, globalization, natural resource and environmental policy, agricultural policies, and technological adoption. The overarching theme of this class is the challenge of agricultural production, processing, and delivery systems feeding the world at affordable prices by 2050 given expected world population growth and increasing constraints on the food system from consumers and policy makers. These constraints or challenges include declining availability of land and water, policies to protect the environment, consumer and producer perceptions of organic and natural foods versus conventionally produced foods, food production technologies such as chemicals and genetically modified organisms. Issues related to food quality, animal welfare, globalization and trade restrictions and poverty are also included. In summary, we will present how we introduce multiple opportunities and constraints facing the U.S. and global food systems that teachers of agricultural courses will be interested in for the long run benefit of their students.

016

The Influences and Adaptation of Technology in Recruitment Efforts

Lynn Hamilton* and Zoe Sanchez
Cal Poly, San Luis Obispo

The Cal Poly Agribusiness (AGB) Department is interested in understanding why and how AGB freshmen are motivated to choose AGB as their major. All entering AGB freshmen (n=166) were surveyed during Fall 2013 regarding the factors that influenced their application to

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Cal Poly Agribusiness. We also investigated their perceptions of the major and careers in agribusiness, as 60% of AGB majors are from urban and suburban backgrounds. The results of the study suggest that while universities invest heavily in social media and their on-line presence, freshmen were most influenced by one-on-one interaction from teachers, coaches and on-campus visits. This study indicates the importance of using a variety of recruitment techniques, both traditional and technology-driven. A follow-up survey at the end of fall quarter 2013 showed a significant change in students' understanding of the agribusiness industry – most students thought of small, family farms as representative of agribusiness at the start of the quarter, but expanded their perceptions to include marketing, sales, and finance by the end of the term. Freshmen recognized the apparent job demand for graduates in these fields. The survey also showed that students gained interest in agribusiness as a major and career area in a variety of ways; more than 70% of entering freshmen had indirect experience with agriculture through family or work experiences, even though they may come from urban backgrounds.

017

USDA/ARS Scientists and UA MACLab Professors Sow Pre-College Seeds for America's Future

Marshall Logvin, Deborah Adams and James Dalton
South Mountain Community College, AZ

The USDA/NIFA A-UBET Grant provides Hispanic and non-Hispanic high school student's access to college biosciences and rich experiences that prepare them for university. A noteworthy success of the USDA/NIFA A-UBET Grant is its volunteer summer internship program. Beginning with three scientists and three interns three years ago, it has grown to nineteen scientists and twenty-six interns today. How does a program where interns complete 240 hours of lab and field work and an independent project in a Phoenix summer succeed? We do it by leveraging resources and meeting each other's objectives. Both ARS and UA MACLab have community service and dissemination in their mission. They also promote diversity in the workplace and value high quality bioscience education in public schools. The A-UBET Grant helps meet these objectives by recruiting and preparing a diverse cohort from inner urban and suburban secondary schools for internships. The interns receive mentoring by the scientists and professors and they become ambassadors for their mentors and host institutions as they present their research at public forums. Interns receive college credit for their internship. ALARC

and UA receive 6,240 intern hours (12,480 since inception). Interns discover the life and passion of scientists and they learn how to become one. Not all interns pursue agriculture careers, but many do. All twenty-six past interns successfully completed the internship and it made a lasting impression both on their lives and their mentors. We extend sincere appreciation to ALARC and UA Mac Lab for their generosity and commitment to student success.

019

Outreach Efforts to Attract Underrepresented Hispanic Students into Agriculture and Related Careers at the University of Puerto Rico

Felix R. Roman,* Winston Dela Torre and Oscar Perales
University of Puerto Rico-Mayaguez

The Center for Education and Training in Agriculture and Related Sciences (CETARS) is a multi-institutional project that brings together five Hispanic serving institutions lead by University of Puerto Rico Mayaguez (UPRM). It is an interdisciplinary effort (agriculture, engineering and arts and sciences students) aimed to provide innovative, high impact research and educational training to students and faculty from underrepresented groups in agriculture and related areas of critical importance to USDA. The program also seeks to increase the interest in agriculture and related careers through the involvement of students and faculty in research projects including outreach activities at 20 participating K-12 schools. Outreach activities presented important issues about agriculture as well as environmental protection, which included hands-on experiential learning activities. These were divided into three components, the Crops Gardens, water and soils assays and coloring book activities. CETARS students from different disciplines visited at minimum once a month during the semester with K-12 students and teachers to construct and maintain a crop garden, teach water and soils assays, and provide workshops. Students also received instruction on seed development, plant growth and management, and food nutrition. A coloring book was designed to introduce kindergarten and early grade students (K-3) to agriculture. CETARS students programed coloring activities to explain the role of agriculture and related activities. A total of 223 kindergarten students participated in coloring book activities, 214 students attended the crops gardens program and 477 participated of the soils and water quality assays for a total of 914 K-12 students, thus generating great enthusiasm among students and teachers.

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020

Incorporating Community Engagement into the Dietetics Curriculum

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Our innovative teaching approach integrated community engagement into three undergraduate dietetics classes over a three-quarter time frame. The objective was to provide students with a high impact learning experience while encouraging Latina women in the community to adopt healthier eating habits. Dietetic students participated in the following ways: conducted focus groups with the women in Spanish, modified traditional Latino recipes, developed culturally appropriate nutrition lessons, and taught nutrition and cooking classes. The USDA-funded Estudiante de Dietético (ED) program students conducted three focus groups in Spanish. The focus group results were used to inform USDA of the Latina's dietary concerns, obtain diet and food patterns, and recipes. Dietetic students in Experimental Food Science class (class #1) modified six traditional recipes to reduce fat and sodium and increase fiber. Students in the Service Learning Nutrition Education class (#2) provided six lessons on healthy cooking techniques to the Latina women and created a Spanish recipe booklet using the modified recipes. Service Learning ED trained Community Nutrition students (class #3) then presented the lessons in Spanish to Latina participants. At the end of each intervention, students that had participated submitted anonymous student satisfaction surveys describing their experience. The dietetic students (n=43) reported increased knowledge and confidence working with this population, and felt that they gained valued additional experience since their classwork involved "real" people. Integrating a community intervention in the dietetic curriculum appears to be a successful way to provide students with valuable real-life experience while providing a community health promotion research program.

022

What Writing Factors Help Students Become Better Communicators, Critical Thinkers and Knowledge Creators?

Holli Leggette*
Texas A&M University

Every agriculturalist—from social scientist to bench scientist—has the obligation to provide consumers with

accurate information and advocate for a stronger, more efficient food and fiber supply. However, some agriculturalists are not prepared to be communicators, critical thinkers, and knowledge creators within their industries. The purpose of this study was to identify writing factors that can be incorporated into course content to help students become better communicators, critical thinkers, and knowledge creators. Research studies (a review and evaluation of theories and conceptual models of writing and interviews with students, faculty, and administrators) were conducted to identify the writing factors that contribute to a more prepared workforce in the social sciences of agriculture. Twelve writing factors were identified: applying writing to real-world scenarios; developing a strong argument; having content knowledge; having knowledge of society; presenting and defending a topic to a variety of public audiences; reading industry-related material; receiving rich, timely feedback; researching and understanding how ideas and concepts are connected; understanding grammar and mechanics; understanding when to be brief and when to elaborate; using writing to apply relevant information to evaluate problems; and writing repetition. The writing factors are not specific to certain courses but can help students develop skills that transfer between courses, across writing tasks, and into the workforce. More research should be conducted to refine the writing factors, understand the relationships between the writing factors, and provide evidence of how the writing factors impact students' ability to communicate, think critically, and create knowledge.

023

Exploring the Experiences and Perception of Local Food Running Through the Classroom

Kyle C. Flynn* and Jennie Popp
University of Arkansas

Studies suggest that with increased access to local food and agricultural education, students are more likely to practice healthier eating decisions. As the number of farms in the US continues to fall, the average individual becomes further removed from agricultural production. As a result, many students gain the majority of their knowledge of farming in a classroom setting. This presentation's objective is to offer a better understanding of how gender plays a role in differing experiences, perceptions, and knowledge of local produce and agricultural practices as well as produce consumption among students in Northwest Arkansas. Eleventh grade students (n=50) from three school districts were asked to answer a survey regarding their local produce and agricultural experiences, perceptions, and knowledge. The research found that young men were significantly

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($p=.01$) more likely to have taken an agriculture class in high school and were significantly ($p=.02$) more likely to correctly identify the average farm-to-plate distance of produce. Furthermore, it was determined that young women were more likely to have positive perceptions of local foods, whereas young men were significantly ($p=.04$) more likely to believe there are disadvantages to local foods. However, neither young men nor young women met CDC's recommendations for fruit and vegetable consumption. This analysis can serve as a starting point for high school and college educators who are interested in 1) exploring their own students' perceptions of and experiences with local foods and/or 2) expanding their classrooms' curriculum to further encompass local foods.

024

The Relationship between Time Management and Academic Achievement among Students in the College of Agricultural and Natural Resources at Razi University

Lida Sharafi, Milad Zhooldideh and Kiumars Zarafshani
Razi University

Time is a valuable resource for college students to succeed. However, students do not use it appropriately. Therefore, college students' time management has been a concern for administrators, academic advisors, and parents. The main purpose of this quantitative survey research was to investigate the relationship between students' time management and academic achievement in College of Agricultural and Natural Resources at Razi University in Iran. The statistical population comprised of students majoring in diverse agricultural fields ($N=1844$). A stratified random sample of 318 students was selected for this study. Time Management survey instrument designed by Britton and Tesser (1991) was back translated and used for the study. Results indicated that PhD students managed time more effectively than their master level and undergraduate counterparts. Results also revealed that there was a positive and significant relationship between time management and academic achievement. The result of this study has implications for higher agricultural education system as well as business prospects in Iran. Students will learn to cope with academic stress and achieve business success in their future career.

025

Teacher Perceptions of the Quantity of Agricultural Mechanics Preparation Received at the University Level

Taylorann Smith,* Ryan Anderson and Thomas H. Paulsen
Iowa State University

The purpose of this quantitative study was to determine the amount of preparation Iowa in-service secondary agricultural educators received at the University level. A paper-based instrument was distributed to secondary instructors at the Iowa agricultural educators' convention. Using a five-point Likert-scale, the survey collected perceptions of the agricultural mechanics skills and training the teachers received at the University level. Five constructs comprised of 5-19 items gave a total of 54 skills that were presented for the teachers' scaled response ($n=130$). The scale was collapsed into two categories representing usable respondents ($n=101$) that received little to no training and strong to very strong training. Safety, welding and construction were skills teachers indicated to have received the most at the University level. It was noted that though welding safety received the most training, the overall mean score was 2.99 on a five-point scale indicating only moderate training. Teachers received the least amount of training in surveying, technology, and tractor skills. Differential and profile leveling received the lowest overall mean scores of 1.56 and 1.59 respectively. The implications for this study noted that a safe and effective agricultural mechanics laboratory is key to providing hands-on learning for students enrolled in agricultural mechanics courses. The lack of high quality instruction in agricultural mechanics at the University level may lead to inexperienced and underprepared educators. In addition to providing safe environments for students to learn in agricultural mechanics courses, time spent developing agricultural mechanics skills must also be taken into consideration.

026

RISE: Pathways to Diversity in Food Science Careers

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University of Puerto Rico

Undergraduate and graduate programs in Food Science in the United States and abroad are experiencing declining enrollments. Some reports have estimated that, as a

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result, approximately 2700 U.S. positions in Food Science and closely related disciplines each year remain vacant. The summer workshop RISE: Pathways to Diversity in Food Science Careers provided “problem solving” learning experiences to students and K-12 educators interested in Food Science with the objective of increasing the number of highly qualified Hispanic students that pursue advanced degrees in Food Science Careers. Modules in: Food Microbiology, Food Fermentation, Food Chemistry and Sensory Analysis were developed. The workshop provided undergraduate students with the opportunity to learn Food Science skills and methodologies, to develop enhanced critical thinking skills and to approach a problem using the scientific method. Graduate students had the opportunity to interact with RISE participants and serve as role models for undergraduate students. Through the workshop all participants demonstrated interest in pursuing advanced degrees in Food Science, and K-12 educators were eager to introduce a lecture laboratory experience on Food Science topics at their schools. RISE is a well-rounded learning experience to increase the number of Hispanic students that attain graduate degrees in the Food Science, facilitating the skill and professional development in order to be competitive for jobs in the food/agriculture sector and at the U.S. Department of Agriculture (USDA) and other federal agencies.

027

Increase Student Retention and Graduation Rate by Offering a Pathway Certificate Toward CA in Agripharmatech

Ingelia White*
Windward Community College

The Certificate of Achievement (CA) in Agripharmatech was approved by the Board of Regents in May 2012 and commenced in Fall 2012. The CA in Agripharmatech has two specializations: the Plant Biotechnology, and the Ethnopharmacognosy. Students are able to complete the CA (30 – 31 credits) in 3 semesters, with coursework flexible enough to prepare them for employment in agricultural biotechnology or pharmacognosy, for entrepreneurship in agribusiness or plant-based product manufacturing, and for seamless credit transfer to higher degree institutions for the study of agriculture, horticulture, plant/microbial biotechnology, ethnobotany, pharmacognosy, pharmacy, nutrition and health-related sciences. A total of 19 CA Agripharmatech diplomas have been awarded. To stimulate and retain incoming second-semester students to continue taking plant science classes, as well as to increase the number of CA graduates, a Certificate of Competence (CO) in Plant-Food Produc-

tion and Technology (PFPaT) was developed and offered in Spring 2014. The CO (9 credits) serves as a leading pathway certificate toward the CA in Agripharmatech and at the same time prepares students for immediate employment, or after having completed one or two semesters in the program, to receive industry internships. The internship salary can be used to pay tuition. Thus, receiving the CO PFPaT should encourage them to continue taking the additional 21 more credits to fulfill the requirement for the CA in Agripharmatech. In Fall 2014, a total of 24 CO graduates will receive certificates in PFPaT. 75% of these CO graduates (18 students) have declared a major in Agripharmatech.

028

What Makes an Effective Coach?: The Relationship between Coaching Behaviors and Team Performance

Jeremy M. Falk,* Douglas T. Masser* and Haylee Palmer
University of Idaho

Daniel D. Foster
The Pennsylvania State University

Graduates from all disciplines in the agriculture industry need to enter the industry with critical thinking, problem solving, and collaboration skills. While classroom instruction can provide a foundation for these 21st century skills, competitive events can provide a motivating, educational opportunity to build industry-relevant skills. FFA Career Development Events (CDEs) provide the opportunity for high school students develop skills in an area of interest. At the postsecondary level, judging opportunities allow students to hone their skills in the animal science industries. The purpose of this study was to describe the coaching behaviors of the 2013 National FFA Parliamentary Procedure team coaches and their relationships with team performance. Survey research methods were used to describe the 41 head coaches at the national event. Each coach was asked about their coaching behaviors and their coaching experience. The top coaching behaviors were providing positive feedback, social support, and training and instruction to the members. There was a relationship between how often coaches that displayed social support and training and instruction behaviors during practice and team performance. As coaches increased these behaviors, the higher the students test scores and overall team rankings. Years of teaching and coaching behavior had a negligible relationship to performance. The researchers suggest that coaches continue to use competitive events as an extension of the classroom and not to be discour-

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aged by a lack of experience. Further research on the behaviors of college-level coaches is recommended.

029

The Impact of Implementing Interactive Exam Review Strategies on Student Satisfaction and Exam Score

Douglas T. Masser,* Jeremy M. Falk,* Amin Ahmadzadeh and Carrie Stark
University of Idaho

Engaging teaching techniques increase student satisfaction and performance in college courses. The purpose of this study was to investigate the relationships between student personality, course review strategy satisfaction, and exam scores. The population consisted of 53 students enrolled in an animal science course. The Real Colors Personality Indicator was administered to describe student personality and a researcher-created questionnaire was used to measure student satisfaction of the review type (four-point summated scale). For Exam 1, half of the students were assigned to the quiz bowl strategy (QB) and half to a lecture review style (LR), both facilitated by the course instructor. The groups were switched for Exam 2. For the final exam, students chose the review session they desired to attend. Overall, students were more satisfied with the QB review ($M = 3.24$, $SD = 0.74$; $M = 3.52$, 0.45) than the LR style ($M = 2.50$, $SD = 0.35$; $M = 2.64$, 0.32) for both Exam 1 and 2, respectively. Also, students who attended the QB review scored greater on Exam 1 ($M = 79.47$, $SD = 13.63$) than the group of students who attended neither review session ($M = 62.41$, $SD = 14.66$). When exam scores of the four personality groups were compared, students with a green personality scored highest on all three exams. It is recommended that college of agriculture professors incorporate interactive review strategies like quiz bowl into their classes and that further research continue to focus on improving college teaching methods.

030

A Faculty Tool Kit for Teaching and Assessing Intercultural Knowledge & Global Competence Embedded Learning Outcomes

C. Calahan, P. Ebner, T. Nennich and M. Russell
Purdue University

We will share a website "Faculty Tool Kit" <http://www.purdue.edu/cie/learning/global/toolkit/> for facilitating and assessing Intercultural Knowledge & Global Competence. The objectives of this presentation are to share the university-wide strategy and examples of active learning methods for faculty who implement study abroad experiences. Our core curriculum consists of two levels of learning outcomes: foundational and embedded. Because it is expected that embedded learning outcomes are facilitated and assessed within discipline-specific programs and majors a faculty continuing education course "Intercultural Learning 101: Study Abroad" is being developed by a university-wide committee to address the concern that discipline-based faculty have for their confidence to teach and assess these outcomes. The initial step is this "tool box" of ideas to assess learning global learning objectives of intercultural openness, intercultural curiosity, global cultural worldview, empathy, and verbal/nonverbal communications. Activities include short sentence reflections, selfie photo colloque, progressive guided journaling, story matrix 4x3, critical incidences short response, etc. If faculty are to be competent and confident in leading and assessing embedded learning activities, the administration must provide them with the tools and training/education to develop the needed competencies to provide a deeper level of knowledge and experiences within our disciplines and departments. We will share examples of material ideas and study abroad courses in which these activities have been utilized.

http://issuu.com/ciepurdue/docs/intercultural_learning_101

031

Does the Learning Really "run through it"? Reflective Narrative Journaling Assesses Learning Outcomes

M. Tucker,* P. Ebner, T. Nennich and M. Russell
Purdue University

The objective is to share a method of assessing learning outcomes that utilizes students' reflective journal responses intentionally tied to specific learning outcomes. We have utilized this facilitative, reflective, self-assessment, narrative method in three different on-campus and group study-abroad courses. An example of the final prompt is "While specifically referring to four different writing assignments, how has your intercultural competence as a writer changed to address different audiences and cultures?" Combining the content analysis of the final reflections allows the instructor to assess self-perceived growth in a particular outcome based on their reflection of how they have changed. We will share

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examples and methods of using content analysis to compare initial, formative, and summative responses to similar prompts regarding student competence and confidence concerning the specific learning outcomes. It is critical to the success of experiences/courses which aim to develop these soft skills to use methods that effectively assess students' learning in the specific stated learning outcome. We hope to stimulate discussion of how to assess, in qualitative and quantitative ways, these types of experiences and outcomes.

032

Using Peer-Review to Improve Writing Assignments in an Undergraduate Turfgrass Science Course

Steven J. Keeley*
Kansas State University

The process of writing about a subject forces the author to grapple with their understanding of the subject matter. Additionally, turfgrass professionals often need to communicate turfgrass management principles to their clientele. Therefore, newsletter articles have been a major part of the course requirement in a senior-level turfgrass science course for the past ten years. The dual objectives of the newsletter article assignments are to increase learning of subject matter, and prepare students to effectively communicate with clients in written form. In 2014, a peer-review system was implemented with the goal of improving newsletter article quality, as determined by final grade and number of spelling and/or grammar errors. Each newsletter article was worth 60 points, and was completed in three stages: Students first submitted an initial draft worth 20 points; they then completed a blind-review of a classmate's initial draft worth 10 points; finally, they revised their initial draft based on feedback from the review process, and submitted a final draft worth 30 points. The instructor also provided a blind review of the initial draft. Students were required to participate in the review process in order to receive feedback on their initial draft. The first-year sample size was small (n=6), but initial results indicate the peer-review process improved newsletter article quality. The mean grade for peer-reviewed articles in 2014 was 93%, compared to 78-83% from 2009-2013 (n=10 to 23, with mean n=15). Furthermore, spelling/grammar errors were reduced to <0.5/article, compared to >5/article from 2009-2013.

033

Utilizing the Tuning Protocol to Develop Student Teacher Confidence in Lesson Planning

Taylorann Smith,* Thomas H. Paulsen and Ryan Anderson
Iowa State University

The purpose of this qualitative pilot study was to determine student pre-service teacher utilization of peer feedback when facilitated by a time managed tuning protocol implemented during a midterm professional development session. The tuning protocol was used during two distinct phases of the student teaching experience. The tuning protocol consisted of five phases of peer reflection and discussion. Guided by two questions, student teachers were asked to reflect on the experience: What are your perceptions of utilizing the tuning protocol? Do you have suggestions for further implementation of the tuning protocol? Reflections were collected in blog format via an online community of practice website. Feedback was provided from agricultural education pre-service candidates (n=9) from Iowa State University. Each response was copied to a word document to be kept anonymous during open coding of each response. Responses were coded by recurring themes that emerged regarding the benefits, drawbacks, structure and format, and recommendations for future implementation of the tuning protocol. One student teacher explained how the protocol allowed users to view lesson designs and determine how students can be better served. Another student teacher appreciated the timed parts of discussion, idea generation, and questions while using the tuning protocol. This study depicts student teachers' perceptions of receiving peer feedback and how it works to encourage improvement of lesson plan design, implementation, and the impact of teaching. Upon further implementation of the tuning protocol and peer evaluation, teacher education programs will be able to assist pre-service teachers in building confidence in lesson plan and activity design.

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034

NIFA National Needs Fellowship Program: Translating Forest Science for Global Practitioners

Thomas Kolb,* Peter Fule, Peter Friederici, Paul Beier, Carol Chambers, Ching-Hsun Huang, Annette McGivney and Kristen Waring
Northern Arizona University

This poster will present the goals and progress of a USDA NIFA-funded National Needs Fellowship program established in the School of Forestry at Northern Arizona University in 2011. The program goal is to train graduate students to effectively communicate research results to forest managers (i.e., research translation). Four masters and one doctoral student were recruited as Fellows for the program; two are female and two are Native American. Curricular innovations include required courses in science writing and video communication taught in the School of Communication, and a course in evidence-based systematic review taught in the School of Forestry. Fellows worked in teams to interview land managers to identify important forest science translation needs. Projects of Fellows include translation of a bark beetle identification guide into Spanish for Mexican foresters, research and communication to forest managers in the southwestern US about best post-fire rehabilitation practices and woodland reference conditions and classification, and two projects focused on Native American forest management practices. An international research travel award received as part of the grant supported travel by one Fellow to Mexico to work with Mexican foresters at the Sierra Gorda Biosphere Reserve, and travel by one Fellow to University of Granada, Spain to study post-fire management. Three of the masters Fellows will graduate after four semesters in the program, one will graduate after five semesters, and the doctoral Fellow anticipates graduating after six semesters. Three Fellows have already pipelined into the professional workforce of the USDA Forest Service.

035

Evaluation of Student Collaboration in a Capstone Agriculture Course through Social Network Analysis

Guang Han,* Thomas H. Paulsen, O.P. McCubbins and Lawrence Caudle
Iowa State University

Student collaboration encourages the articulation of thought, helps create effective learning environments, and promotes numerous learning outcomes. Collaborative decision making has been identified as a critical component of capstone courses. However, literature has provided limited information on the evaluation of student collaboration. This study was implemented to determine if collaboration between and among students in an undergraduate capstone farm management course changed after implementing specific assignments and activities tailored to improve collaboration. Social Network Analysis (SNA) was used to measure student collaboration. Each student was asked to list the name(s) of other student(s) with whom they have collaboratively worked/consulted, for projects, study, assignments, and problems related to the capstone course. The instrument was administered twice, at the midpoint and at the end of the semester. The survey yielded a 96.3% response rate (n=50). Data were input into UCINET, a SNA statistic and graphic software package. The overall density improved from 0.252 to 0.352 (39.6%); the total number of ties increased from 617 to 862 (39.6%); and the average degree of centrality increased from 12.3 to 17.2 (40%). The results show that from the midpoint to the end of the semester, student collaboration was significantly enhanced. These results also provide a course benchmark to determine the effectiveness of teaching strategies and class activities regarding engagement in student collaboration. Further interventions should be developed, implemented, and evaluated to identify best teaching practices to enhance student collaboration in a capstone farm management course.

036

Identifying Critical Thinking Skills in a Capstone Agriculture Course

Lawrence Caudle,* Thomas H. Paulsen, O.P. McCubbins and Guang Han
Iowa State University

Critical thinking calls for a deeper investigation of ideas, being unbiased and broad-minded on various viewpoints, and having the ability to make decisions for one's self. Unfortunately, some educational coursework does not challenge students to think critically. Gubbin's Matrix of Thinking Skills identifies several components of problem solving and decision making—two primary outcomes of agricultural capstone courses. Students must be able to identify problems, formulate solutions and decisions, and implement those decisions. A capstone agricultural business management course at Iowa State University utilizes a student managed farm which allows senior level students each semester the opportunity to foster criti-

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cal thinking skills by becoming the managers of a diversified farming operation. The purpose of this study was to analyze various activities and assignments performed by the students to measure how problem solving and decision making are derived from these activities. The State of the Farm and the Strategic Issue assignments are exemplary in developing problem solving and decision making skills. Activities require the students to review and evaluate previous class documents to determine the current state of the farm. They must define and understand issues related to the farm, determine goals to facilitate the financial and physical well-being of the farm, formulate various alternatives, and develop plans to implement decisions. Through these assignments students analyze, calculate, and evaluate each decision the class makes in determining how to efficiently manage the farm. Further integration of critical thinking skills in class assignments to enhance student attainment of course outcomes is recommended.

039

How do Clemson University Students in the School of Agriculture, Forest and Environmental Sciences (SAFES) Learn?

H. Valdetero,* E. Vincent and T. Dobbins
Clemson University

Learning styles can affect the way in which students take in and process information. Instructional methods directed at specific learning styles can increase long-term retention of material and facilitate lifelong learning as opposed to a traditional Westernized educational system primarily targeting short-term memory capacities. The VARK questionnaire is a widely used online assessment to determine whether or not a participant's preferred learning style is visual, aural, read/write, kinesthetic, or a multimodal combination of any or all four types. The purpose of this study was to determine if the VARK questionnaire is a valuable assessment tool for college students in improving retention and application of course material, and if it has the potential to be a valuable tool for instructors to improve creative delivery styles for their curriculum content in accordance with how their students learn best. Students (n=38) in the School of Agriculture, Forest, and Environmental Sciences (SAFES) at Clemson University were given the VARK to determine their learning preferences. 47.4% were found to be multimodal (VARK), and 21.1% were found to be kinesthetic. Given the hands-on approach of many agriculture related majors, it is expected that students will be strongly kinesthetic. Preliminary information will be expanded upon to include a larger sample of students. Results will be used to determine if there is a correlation between learning

style and selection of major, and to improve course delivery. Further analysis will examine if students are drawn to instructional methods based on the best way in which they process information.

040

A Feeder-Packer Simulation Provides an Experiential Learning Opportunity for Students in Animal Science

Scott Schaake, John Unruh, Terry Houser, Dave Nichols, Carrie George-Erins and Mishelle Hay-McCammant
Kansas State University

The beef feedlot and packing industry are major contributors to the economic well-being of Kansas agriculture. As the enrollment of non-traditional Animal Science student's increases, the need for experiential learning opportunities also increases. Kansas State University students enrolled in a Livestock and Meat Evaluation course participate in an interactive simulator of the fed cattle market and packing industry. Students are randomly assigned into groups and experience both feedlot and packer operations. Feedlot operators have the opportunity to purchase feeder cattle through private treaty and competitive bidding. Various breed types, sexes, ages and weights of cattle are offered through the auction. Breakeven values are calculated by both feeders and packers. Cattle are merchandised at either 130 or 160 days on feed. Feedlot operators sell cattle to packers at a negotiated settlement on a live basis for cattle fed 130 days and a carcass basis for cattle fed 160 days. Packers purchase cattle from the feedlots, process them, and sell in a wholesale market. The wholesale market changes with supply and demand. Upon completion, students submit a summary report for both feedlot and packer transactions. Effects of initial weight, genotype, days on feed, yardage, interest rates, death rates, average daily gain, feed efficiency, yield grade, and quality grade are incorporated into the simulation. Student grades are based on profit/loss margins, accuracy of work and group interaction. Semester evaluations reflect high student approval for this activity and an increased understanding of the cattle feeding/packing industry.

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041

Assessment of a Food Science Program Using Core Competency Questions Administered to Freshman and Seniors

John A. Unruh,* Daniel Neely and Mary Houser
Kansas State University

The objective was to develop a tool to assess the knowledge student learning outcome of the Food Science and Industry Program at Kansas State University. A total of forty multiple-choice questions including ten questions covering each of the four core competency areas of Food Chemistry and Analysis, Food Safety and Microbiology, Food Processing and Engineering, and Applied Food Science as described by the Institute of Food Technologists (IFT) were developed. The questions were administered in the required Food Science Freshman Orientation and Senior Seminar courses. Within each class, the Science (an IFT-approved curriculum) and the Food Business & Operations Management (FBOM) options were analyzed separately resulting in Senior Science (n=20), Senior FBOM (n=13), Freshman Science (n=11), and Freshman FBOM (n=7) comparisons. For the Food Chemistry/Analysis and Food Safety/Microbiology areas, Senior Science students had ($P<0.05$) the highest percentage of correct answers and Freshman (Science and FBOM) students had ($P<0.05$) the lowest. For Food Processing/Engineering, Senior Science students had ($P<0.05$) the highest percentages and Freshman FBOM students had ($P<0.05$) the lowest percentages. For Applied Food Science, Senior (Science and FBOM) students had ($P<0.05$) the highest percentages and Freshman FBOM students had ($P<0.05$) the lowest percentages. For Total Questions, Senior Science students had ($P<0.05$) the highest percentages and Freshman FBOM students had ($P<0.05$) the lowest percentages; and Senior FBOM students had ($P<0.05$) higher percentages than Freshman Science students. The questions developed and first year's data provide a baseline that can be used to assess future knowledge student learning outcome components.

042

Reflections of Plant Science Graduate Students Engaging K-12 Students While Utilizing Learner-Centered Teaching Strategies

Melissa Leiden Welsh and Neil A. Knobloch
Purdue University

Industry, academia and societal pressures are influencing the training of future research scientists to acquire teaching skills beyond traditional university teaching assistant positions. As such, graduate students ($N = 24$) studying to become plant scientists were taught Learner-Centered Teaching strategies to disseminate their research to K-12 audiences. Graduate teams planned, assembled and facilitated lessons on the following topics: DNA basics, genetic traits, urban forestry, plant disease and plant disease resistance, plant parts and functions, GMOs, plant origins, bioinformatics, agronomy and Mendelian genetics. Lessons were taught in grades 3 through 12 at urban, sub-urban and rural school sites in a Midwestern state. Upon completing the teaching experience, graduate students assembled a reflection essay and self-evaluated using retrospective LCT and comprehensive teaching assessment rubrics. Graduate students self-reported higher ratings on both the LCT and comprehensive teaching assessment rubrics. All self-reported rating differences for both rubrics had large effect sizes ($d \geq 0.8$). Reflection essays detailed the graduate students' enjoyment of facilitating plant science research lessons, the challenges and benefits of using LCT strategies versus their embedded lecture habits and the creation of plant science engagement tools. International students expressed fascination with observing learning environments in American schools. All graduate students conveyed a passion to share elements of their research and motivations for career exploration in plant sciences. Graduate students with previous TA responsibilities noted professional development differences when engaging with a K-12 audience. Graduate students valued this experience as a part of their preparation to become plant scientists.

044

Coming Full Circle: Linking a University Animal Science Class to a Primary School Agriculture Education Program

H.M. Cunningham, D.C. Penrice, F.E. Robinson and M.J. Zuidhof
University of Alberta

The opportunity for elementary school children to learn about agriculture and where their food comes from is a valuable one. Introducing children from urban areas to fundamental agricultural concepts as early as primary school allows them to generate questions about an aspect of life that is not often talked about in their daily lives. In the Animal Science 200 class (Principles of Animal Agriculture), students apply lecture material to a presentation-based project called "There's a Heifer In Your Tank", answering questions about agriculture that

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members of the public may have. In 2005, university students from Animal Science 200 visited elementary schools and helped primary school children create a "There's a Heifer In Your Tank" of their own. The elementary school children researched and formulated their own agriculture-based questions, and created a presentation including their answer with the help of the Animal Science 200 students. Teaching agricultural concepts to the primary school children gave the Animal Science 200 students an opportunity to synthesize the course material in an interactive fashion. A detailed description of the program and a testimonial will be given from a student that participated in the elementary school agriculture education program in 2005, and nine years later became a student in the Animal Science 200 class. This presentation will discuss how being introduced to agriculture in a classroom setting at an early age influenced undergraduate life as well as academic program selection.

045

Building on Partnerships, Projects and Purpose: Producing Webinars to Enhance Learning in Agricultural Education Classrooms

Jaclyn F. Tweeten* and Thomas H. Paulsen
Iowa State University

One of the latest developments in information communication technologies that can be used as a learning method is the use of webinars. Webinars include presentations, lectures, workshops, or seminars which are broadcasted via the Internet. Webinars allow users to communicate for business meetings or educational purposes. Since webinars allow users to communicate for educational purposes Iowa State University has partnered with Eastern Iowa Community College district to create a series of free webinars on the latest research regarding agricultural bioenergy. This project is designed to build from prior experiences with research scientists, industry leaders, and development programs in agricultural science. The project is also designed to improve the quality of agricultural education by bringing emerging research to the classroom. In order to achieve these goals, the project consisted of developing three to six professional webinars per year. Lastly this webinar project consisted of developing science and inquiry based activities for agricultural education students in high school and community colleges. The learning activities are available for use by agricultural education teachers. This presentation will share how agricultural education research in the areas of wind energy, biofuels, solar energy, agricultural policy, bioenergy, biochar, and weather extremes were developed for use by secondary and post-secondary teachers. As of March 2014, the AgEn-

ergy modules and lab activities have had over 16,400 downloads. This exceeded the expected outcome of having at least 100 faculty download the curriculum.

046

Perceptions Regarding Importance and Frequency of the Use of Communication Tools by Iowa Cattle Producers

Jaclyn F. Tweeten* and Thomas H. Paulsen
Iowa State University

New communication technologies have affected the agricultural industry in the 21st century. Communication technology has been shown to be beneficial to farm operations in obtaining information. Understanding cattle producers' perceptions and usage of communication tools will allow beef industry partners and beef breed associations to communicate better with producers. The objective of this study was to determine Iowa Cattle Producers' perceptions regarding the importance and frequency of use of selected communication tools. The innovation decision process served as a theoretical framework for this study and is the progression through which individuals gain knowledge of an innovation prior to its adoption or rejection. The population consisted of Iowa Cattle Producers who received the Iowa Cattlemen's Association electronic newsletter (N=3021), from which a random sample (n=974) was taken. An electronic questionnaire was distributed to producers and framed into three constructs: traditional media, electronic media, and social media. The constructs measured producers' perceived importance and frequency of use regarding personal and beef industry information. Construct means and standard deviations were calculated using Predictive Analytical Software Statistics 18. Respondents utilized electronic media for beef industry purposes, but did not prefer social media for obtaining personal or beef industry information. One could imply that Iowa Cattle Producers are in the knowledge stage of the innovation decision process and have not yet formed an attitude about adopting social media. It is recommended that the Iowa Cattlemen's Association use electronic forms of communication such as websites to promote the importance and use of social media.

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048

Student Survey of a Flipped-class Model in a Sensory Evaluation of Foods Lecture

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University of Illinois at Urbana-Champaign

The flipped class model promotes student engagement and learning through group activities and discussions by moving traditional lecture instruction outside of the in-class setting. This model was implemented in a Food Science and Human Nutrition course on the Sensory Evaluation of Foods. This model involved two methods of student learning: online video lectures and in-class group discussions and assignments. Students viewed two online video lectures, approximately ten minutes each in length, before attending class. Online PowerPoint-based video lectures were prepared in two manners: 1) only audio recording over slides and 2) lecturer-embedded video in the slides through Personify program. During in-class activities, online video content was used to spur discussion and guide group assignments. Upon course completion surveys assessed student perceptions regarding the flipped class structure, in-class activities, and online video lectures. Participation was measured by tallying the number hand-raises per lecture. Surveys indicated students appreciated the time spent engaging in lecture discussions and preferred online videos with the lecturer-embedded over audio-only videos. They saw videos as a useful tool for understanding and reviewing lecture concepts. Flipping the class afforded students a deeper understanding of the course material through in-class discussions. On average, 19 hand raising events occurred per class indicating a high participation in a course of approximately 50 students. Modifications to in-class activities and online video lectures can be made based on survey feedback. The flipped class model can successfully be used in the lecture setting to increase student engagement and deepen understanding of course material.

050

The HYMAX Academy: Learning in and About Agriculture Runs through It!

Robin Peiter Horstmeier*
University of Missouri-Columbia

Agriculture leaders believed Agriculture could be more positively promoted, as the public agricultural literacy was declining. In 2011, Missouri's State FFA Advisor retired after many years of service to youth and the agri-

culture industry. Numerous individuals made donations to honor him, resulting in establishing the HYMAX Academy (Helping Youth Maximize their Agricultural eXperience). The purpose of this Academy is to strengthen the agriculture industry by challenging outstanding sophomores to explore leadership, communication, agricultural literacy, and personal and career development. The end product is strong AGvocates who positively educate the public in their community, state and nation. Objectives include: 1) strengthen youth leadership capacity; 2) build on enthusiasm of first year FFA members to strengthen their future FFA experiences; and 3) challenge youth to serve their local community. Using both quantitative and qualitative methodologies, youth reflected the impact of HYMAX. A few responses include: "I learned a lot and can't wait to go back to my chapter and share what I learned." (Joe); "All the speakers were amazing. Very educational and inspirational!" (Susie); "I loved my group and wish I could come back next year. I know I will use what I've learned throughout my Ag career. I love FFA." (Kelsey). HYMAX challenges youth from the opening session to think broadly. Critical and creative thinking skills are encouraged through small groups, where both pros and cons of a controversial agriculture topic are presented in 8-10 minutes. The synergy resulting in the small groups has led to entertaining, educational presentations; which highlight the HYMAX Academy.

051

Effects of an Applied Agricultural Calculations Course at Clemson University: A Longitudinal Study

P.M. Fravel and Chelsey Francis
Clemson University

The need to improve pre-service agricultural educators' mathematics abilities has long been recognized. This study at Clemson University focused on how an applied agricultural calculations course has improved the mathematics abilities of pre-service agricultural educators. In this applied mathematics course, students were exposed to various agriculturally related mathematics problems, broadly ranging from turf grass to animal feed analysis. The purpose of this course was to expose students to mathematics in a context they can incorporate into their future classroom and teach to high school students. The applied agricultural calculations class can be broken down into five main areas of application: conversions, measurement, applied calculations, geometry and finances. The overall gain in each of the five main areas, as well as year to year variation are important factors in determining the effects of the class. The test population included students majoring in agricultural education, ag-

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gricultural mechanization and other majors within the College of Agriculture, Forestry and Life Sciences (CAFLS) at Clemson University. All participants were students at Clemson University and ranged from freshmen to graduate students. Data was collected from the fall semesters between 2006 and 2012. Over the seven consecutive year period, 95 students participated. Students completed a 78 question pre- and post- test at the beginning and end of the semester to measure their abilities. The average pre-test score was 36.29 points and the average post-test score was 52.27 points, both of the 78 possible points; producing an average gain of 15.98 points.

052

Factors of Adolescents' Civic Engagement in the Learning Process

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The Pennsylvania State University

Pat Dolan
National University of Ireland Galway

This research identified factors related to civic engagement in rural adolescents, ages 10-18 years old in both Ireland and Pennsylvania. To understand civic engagement an understanding of the factors shaping adolescents' civic engagement is necessary. Personal characteristics, obstacles, social support, social networks, and the role of community as factors either shaping or inhibiting civic engagement were explored with an emphasis on identifying obstacles to civic engagement. If adolescents see the benefits of civic engagement at an early age, they are more likely to stay involved throughout their life; including through college. Learners at all levels experience barriers to civic engagement, thus educators need to understand these barriers to improve students' learning outcomes. Surveys were administered to 210 adolescents. Data was analyzed through frequencies, bivariate, and multivariate analysis. Nine factors to adolescents becoming civically engaged were defined in this research. Five had a positive relationship (friends items, community, too much to do for school, have a part time job, and don't see an identifiable role for you in organizations), four had a negative relationship (intimidated by others, not located near enough, taken seriously by adults, parents wouldn't approve). Recommendations were made for policy and programming, use of technology, use of social media to encourage social networking, incorporating opportunities into the academic setting and ensuring students obtain the learning outcomes. Attention should be given to assure sufficient variety of activities to attract a wider range of participants and to offer

both online activities and those that provide adult human contact (mentors, advisors).

053

Factors Influencing Choice of Food Safety Related Career Path -- An Online Focus Group Study

Joan Hegerfeld-Baker,* Sanjeev Anand and Elizabeth Droke
South Dakota University

Prasanthi Pallapu
Upper Iowa University

Trained professionals with science, technology, engineering, and math (STEM) backgrounds are needed by industries and government to maintain the safety of the food supply. Information regarding the influential factors encouraging students to major in a STEM food safety related career path is lacking. Four online focus groups (N=20 students) discussed questions related to their career decision to major in a food safety related field of study. Social Cognitive Career Theory guided the development of five questions. Students were required to answer each question and respond to two other students within their group. Using focused coding, the data was read line-by-line and assigned descriptive labels that were tracked for frequency. Meanings were applied to the descriptive labels. Themes were then constructed from the focused coding associated with career path decisions and potential impact on the safety of the food supply. Passion for career was the identified as the most influential factor in choosing their major while financial stability was referred to in a subtle manner. High school agriculture classes and FFA programs were identified as influential in directing participants to a chosen career path. Forty-five percent of the students identified the unique experience of growing up on a farm as an influential factor. The focus group process provided insight regarding factors influential to choosing a career path related to food safety. This information, when used with other research, is useful for development of student recruitment strategies to food safety related majors.

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055

An International Comparison of Agricultural College Students' Views on Natural Resources

Ashley Sutton,* Dale Layfield, Thomas Dobbins and Paula Agudelo
Clemson University

Food security, environmental sustainability, and population increase are topics that frequent newsfeeds on a daily basis. These topics are intertwined and collectively dependent on the status of available natural resources. Undergraduates enrolled in Colleges of Agriculture are often well versed on these issues and recognize that our planet is a closed system impacting the ways we function. However, students often struggle to conceptualize the impact(s) of their personal and/or their country's actions on a global scale. Three focus groups were held with agricultural college students from Colombia, Russia, and the United States. The objective of this research poster presentation is to display insight into young agriculturalists' perspectives on international agro-environmental relations and identify differences, if any, between the three cultures. This exploratory research project was designed to bring understanding across borders and provide recognition to culturally different views and opinions regarding natural resource use on both local and global scales. A review of findings indicated that in each country some issues were similar, including: the value of natural resources and the need to conserve and use them wisely; the push for more sustainable use of natural resources; governments' responsibility for regulating sustainable use of natural resources, and education's role in creating awareness of the responsible use of those resources. Some of the common themes identified in the focus groups were the impact of corporate capital allowing for greater preservation of natural resources and the role between local and federal governments in programs focusing on preservation of natural resources.

061

Multiple Perspectives on Service Learning in Agricultural Communications

Courtney Meyers* and Erica Irlbeck*
Texas Tech University

Recently, more emphasis has been placed at the post-secondary level to use active learning techniques to strengthen student engagement and cognition. One of these techniques is service learning. The presentation

will discuss the integration of service learning in two agricultural communications courses at a southwestern university. One course is a public relations writing course for agricultural communications majors in which students work individually with clients to develop items for a media kit. The other is a senior-level course where students work in teams to address an identified need for a shared client through the creation of a communications campaign. The presentation will summarize and connect the perspectives of the various groups involved in the service-learning experience in agricultural communications. First, students in both courses are required to reflect on their service-learning experience. These reflection papers serve as the unit of analysis for their perceptions of service learning. In addition to the students' perspectives, the individual clients who serve as community partners are surveyed using a researcher-developed instrument to assess their satisfaction with the experience and to identify necessary improvements. Finally, the instructors reflect on their experience and provide lessons learned and suggestions for future service-learning projects that could apply to various disciplines. Overall, students, clients, and faculty agree the integration of service learning in agricultural communications courses is an effective way to enhance learning, encourage community engagement, and revitalize the instructors. This presentation will help inform others who would like to integrate service-learning in their classes.

062

Enhancing Regulatory Compliance among Florida's Farm Labor Supervisors

Fritz M. Roka,* Paul F. Monaghan, Carlene A. Thissen, Maria C. Morera, Sebastian Galindo-Gonzalez, J. Antonio Tovar-Aguilar and Cesar Asuaje
University of Florida

The Farm Labor Supervisor (FLS) Training program is administered through the University of Florida /IFAS Cooperative Extension Service and targets supervisors of migrant and seasonal farm workers. The training objectives are to concisely and succinctly teach employers the rules and regulations that keep farm workers: fairly paid; free from discrimination and harassment; safe from pesticide exposure and other hazards; transported in well-maintained vehicles and, if applicable, safely and comfortably housed. The objective of this presentation is to discuss how both educational content and teaching methods have evolved since the program began in 2010. Advisory committees and participant feedback guided us in adjusting the program content to best fit location specific needs and challenges. For instance, the use of licensed crew leaders among tomato growers near Im-

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mokalee, Florida is common, while not prevalent among strawberry growers near Plant City. Labor supervisors in both areas, however, face similar compliance issues with respect to wage and hour regulations. In addition, teaching methods have evolved to more effectively engage an underserved clientele (i.e. crew leaders), many of whom have limited formal education. During the 2013 training season, case studies and interactive exercises replaced much of the PowerPoint/lecture format that was originally developed in 2010. Pre- and post-test results indicated that, on average, participant knowledge increased 33% in 2012 and more than 40% in 2013. The presentation ends with an outline of how the FLS program will continue to evolve and develop into a professional certification.

063

Agriculture Majors Perceptions of Alternative versus Conventional Agriculture Paradigms

G. Cameron Jernigan, Donna L. Graham and Donald M. Johnson
University of Arkansas

This study examined the perceptions of 526 agriculture students at the University of Arkansas on the alternative and conventional paradigms (ACAP) of agriculture, using the ACAP scale (Beus and Dunlap, 1999). Conventional agriculturists promote agriculture as large scale, industrialized production that is capital intensive, highly mechanized, using synthetic fertilizers and pesticides. Alternative agriculturists view agriculture as smaller farm units, reduced use of chemicals and energy, greater self-sufficiency and resource regeneration. Significant differences were found by college majors with horticulture and environmental science majors holding more to the alternative paradigm while other majors were more conventional. Female majors in environmental sciences and horticulture held a more alternative viewpoint of agriculture than males in these majors. Significant differences in pre-college residence were found where students from farms were more conventional, while those from the country, non-farm, were more alternative. Students whose parents have college degrees had more conventional perceptions and were significantly different from students whose parents had less than a high school education with alternative perceptions. Defenders of the conventional agricultural system feel current problems can be solved by scientific and technical progress while alternative agriculturists believe a complete revamping is needed to solve the ecological, economic and social problems associated with agriculture. Agriculture graduates who will shape policy for the future will need knowledge and skills to work with these opposing groups. Faculty viewpoints and curriculum review is

needed to determine if colleges are influencing student viewpoints of agriculture's impact on the environment and the sustainability of practices and policies.

064

What Makes a Manuscript Publishable in the NACTA Journal?

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In 2006, the NACTA Journal switched to electronic submissions through the FastTrack system. Between 2006 and 2012, 429 manuscripts were submitted. Of these manuscripts, 141 (33%) were rejected. The seven-year history of reviews from rejected manuscripts was studied to analyze and categorize reasons for rejection in an effort to help reviewers, authors and to review submission guidelines. Most (96%) of the manuscripts studied were rejected with a resubmission requested, giving the authors a chance to revise and resubmit. Fifty (35%) of the authors that were given a chance to revise and resubmit did not resubmit. Of the 85 (60%) that chose to revise and resubmit, 62 of these were accepted and published, while 23 were rejected. Only six manuscripts were rejected outright on first submission. An analysis of the reviews from these rejected manuscripts provides helpful insights into what contributes to a publishable manuscript. Some of the most common problems with manuscripts included: nothing new, not a significant contribution; no statistics to support use of the word "significant;" conclusions not supported by literature or research; repetitive content; inconsistencies within the manuscript; failure to connect to education or the improvement of teaching; typos, grammar and spelling; overly inflated with words; lack of focus; lack of details; limited, outdated or poor literature review; poor use of tables or graphics; and lack of meaningful content. All of the reviews from the 141 rejected manuscripts were combined into one document and used to create a word cloud. Also, based on this analysis more helpful tips were added to a revision of the NACTA Journal Instructions for Authors.

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065

Experiential, Collaborative Learning in Undergraduate Agricultural Science

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The objective of this study was to determine the impact of using a collaborative livestock feeding trial between undergraduate agricultural courses to apply basic principles of livestock nutrition and experimental design. Data from students in animal nutrition (n=43) and in agricultural research (n=45) were surveyed to determine perceived ability and experience after participating in a collaborative livestock feeding trial. Agricultural research students applied principles of experimental design to setup the trial. Animal nutrition students managed the trial, including daily feeding management and feed adjustments. Animal nutrition students were paired and then teamed with paired students from the experimental design course, creating peer mentor groups. Using a pre- and post-trial survey, students identified their level of ability or experience using a 5-point Likert scale (1=no knowledge/experience, 5=very knowledgeable/experienced). Data were analyzed using Kruskal-Wallis one-way ANOVA. Improvements ($P<0.05$) were reported by nutrition students pre- and post-participation in the trial in nutritional management and research concepts. Improvements ($P<0.05$) were reported by research students pre- and post-trial pertaining to perceived ability in areas of statistical analysis and interpretation; however, these differences did not necessarily translate into perceived differences in experience pre- and post-trial. Student groups demonstrated increases ($P<0.01$) in perceptions of ability and experience in mentoring peers. Experiential, collaborative learning in the form of a shared livestock nutrition research project appears to improve perceived ability and experience levels of students in agricultural courses.

066

Relationships between Home Community, Major Choice, and Current Residence for Rural and Non-rural Graduates in the College of Agricultural, Food and Life Sciences at the University of Arkansas

Hanna Estes, Stuart Estes, Donald M. Johnson, Leslie D. Edgar and Catherine W. Shoulders
University of Arkansas

Rural states must increasingly face the effects of the migration of rural youth to more urban areas. Using institutional data for 2007 and 2008 College of Agricultural, Food and Life Sciences (AFLS) graduates (N = 650) at the University of Arkansas, this study described relationships between home community (rural or non-rural), major, and the community (rural or non-rural) where students lived 6-7 years after graduation. Chi square goodness-of-fit tests were used to determine significant associations ($p < .05$) by major. Overall, 347 rural students (53.4%) and 303 non-rural students (46.4%) graduated from the college of AFLS. Of the rural students in the college, 60.5% returned to rural communities after graduation. Rural graduates in poultry science returned to rural communities at a significantly higher rate than the college (83.3%). Rural graduates from environmental, soil, and water science and food science returned to rural communities significantly less compared to the college (36.5% and 20.0%, respectively). Of the non-rural graduates enrolled in the college, 87.8% returned to non-rural communities. For non-rural graduates, there were no significant differences between major and where the graduates lived after college. Based on this data, rural students who desire to return to rural communities after college should consider poultry science as a major. Rural students who plan on majoring in environmental, soil, and water science or food science should be prepared to live in non-rural areas after graduation. Future research should determine how important area of residence after graduation is as a factor in choice of major.

067

Impact of Virginia Tech Summer Academy on Student Intended Major

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Virginia Tech

The Virginia Tech Summer Academy (VTSA) began in 2012 and is based on the Pennsylvania State model. This program, designed for accepted first-year or transfer students, aims to ease the transition from high school to a large university while offering students the opportunity to become familiar with campus life and academic expectations. The 2013 VTSA had 240 students enrolled in 25 academic tracks. All tracks consisted of two discipline-specific classes. This study focused on students enrolled in the five tracks within the College of Agriculture and Life Sciences (CAL S). The objectives of this study were (1) examine the factors influencing the students' participation in the VTSA program, (2) examine the factors influencing students' choice of CAL S, and (3)

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determine if the VTSA classes impacted student choice of intended major. At the conclusion of the summer program, 42 students were asked to participate in an online survey and 23 responded. Results indicate the predominant factors motivating students to attend the VTSA included: the opportunity to begin their college experience early, family encouragement, participation in smaller classes, and lessening first semester workload. The CALS specific classes had an influence on intended major for 28% of participants. Two focus groups (n=5) were conducted to further develop the themes identified in the survey analysis. Focus group results indicate that the VTSA either confirmed intended academic major or made students aware of unknown major options. Encouraging students to participate in a summer bridge program with discipline-specific classes could impact participation within a specific major.

068

Improving Hispanic Student Success through Experiential Learning Opportunities

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Hispanics are largely underrepresented in careers that focus on food and agricultural science because these careers often require an advanced degree. Recent efforts at Texas A&M University-Kingsville, a Hispanic Serving Institution, have been implemented to improve not only retention and graduation rates in the animal science program, but also to increase interest in obtaining an advanced degree. Consequently, the objective of this project was to improve academic success of underrepresented students through experiential learning opportunities. Total undergraduate animal science program enrollment has increased 77% and Hispanic undergraduate student enrollment has increased 111% since the initiation of the project. In 2013, cohorts of seven undergraduate students (86% Hispanic) were selected to work on research projects to better understand the expectations of graduate school. Survey results indicate that prior to working on their project, 57% had a high interest in obtaining an advanced degree whereas 43% had an above average interest in obtaining an advanced degree. After nine months of working on their respective projects, 86% had a high interest in obtaining an advanced degree whereas 14% had an above average interest in obtaining an advanced degree. This data suggests that students participating in undergraduate student research increase their already strong desire to attend graduate school. Participation in professional development activities and level of self-confidence was also improved. Continued efforts with undergraduate

student research will result in successful Hispanic graduates who are competitive for careers requiring advanced degrees in the food and agriculture sector.

069

A Broad-based Strategy for Study Abroad Programs: The Ghana Experience

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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 summer 2103, ten 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. They earned one or three credits in courses 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 village producers. The main features of the mission were interdisciplinary, team guiding and teaching approach by the interdisciplinary faculty, to facilitate interaction among the varied backgrounds and majors of students. The management of the mission for a multidisciplinary / multi-institutional group involved a strategy that enabled participation of each specialization in the discussion from their perspective. The pre-trip and post-trip surveys of the students indicated that the strategy was successful and helped students understand key characteristic features of agricultural development in countries in-transition. Students' knowledge was assessed in three broad areas of international agriculture, culture and history, and personal development and all the metrics showed improvement. Student experiences encompassed agricultural policy development, implementation, and its influences on market creation for businesses and market access for farmers. 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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072

Leadership Assessments within Agricultural Business Students

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Leadership is a process that builds overtime. As a process, leadership skills can be cultivated within the classroom over the course of a semester. This study is designed to evaluate students enrolled in an agricultural sales course offered at a Southern land-grant university to determine if the course content influenced their leadership skills as related to sales. For the purpose of the study, 57 students were administered a series of assessments as a pre-test at the beginning of the semester to assess personal strengths (StrengthsFinder assessment), introversion vs. extroversion, and task vs. relationship orientation. Students were then given a post-test two weeks before the end of the semester with the same assessments. Once information was coded, frequency, means and averages were calculated and comparisons were made between the pre- and post-tests results. While a total of 57 students were enrolled in the course, only 53 pre- and post- assessments were returned. Overall, students showed signs of becoming more extraverted and relationship oriented towards the end of the semester as they gained sales skills. The StrengthsFinder assessment results widely varied. The conclusions of this study demonstrated a slight shift in students' leadership skills and personalities towards characteristics and traits beneficial in sales. Further research could determine if these aspects of personality and leadership strengths can be taught or influenced by certain situations or course content.

073

College Choice and the Rural Brain Drain: Evidence from One Land-Grant University

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University of Arkansas

Rural communities increasingly see negative effects of out-migration of youth in search of postsecondary education and subsequent careers. This study identified relationships between home community (rural or non-rural), college of enrollment, and the type of community (rural or non-rural) where graduates lived six or seven years after graduation using institutional data for 2007 and 2008 University of Arkansas bachelor's degree

graduates (N = 6204). Chi square goodness-of-fit tests were used to determine if significant ($p < .05$) differences existed between the university as a whole and its six undergraduate colleges. Overall, 44.0% of graduates were originally from rural areas; Agricultural, Food and Life Sciences (AFLS) and Engineering had significantly higher percentages of graduates from rural areas (53.4% and 50.9%, respectively). Business had a significantly lower percentage of graduates from rural areas (40.0%). Overall, 29.2% of graduates currently live in rural communities. AFLS and Engineering had significantly higher percentages of graduates living in rural communities (38.0% and 34.7%, respectively); Business and Arts and Sciences had significantly lower percentages of graduates living in rural communities (26% and 27%, respectively). Overall, 52.3% of graduates from rural communities returned to rural communities; AFLS had a significantly higher percentage of rural graduates returning to rural communities (60.5%). Overall, only 11.0% of non-rural graduates were currently living in rural areas; there were no significant differences by college. Rural AFLS graduates were more likely to return to rural areas than were other graduates. These findings should be communicated to parents, students, educators, and leaders in rural communities.

074

Preparing Hispanic Students to be Leaders in Their Communities

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The United States (U.S.) is in transition, changing in cultural and population diversity. Texas has the second largest population in the U.S., of which 38% are Hispanic. Hispanics make up 24% of the state's university graduates but only 20% obtain a degree in Science, Technology, Engineering and Math (STEM). As a consequence, there is a shortage of Hispanic professionals to support the development of their communities. The United States Department of Agriculture- National Institute of Food and Agriculture (USDA/NIFA) Hispanic Serving Institutions (HSI) Grant: STEP UP to USDA Career Success involves five South Texas educational institutions working with the objective of improving the graduation rates of Hispanic students. The programs offered include (1) placing students in summer internships at USDA and other agricultural institutions, (2) recruiting and financing graduate student work-study programs, (3) assisting in the transference of students from two-year institutions to four-year colleges, and (4) offering summer camps to promote the programs of Texas

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A&M University-Kingsville (TAMUK). The first two years of the project resulted in one hundred twenty one students participating in summer internships. Seven graduate students were supported by the work study program. Seven students transferred from two years institutions (Texas State Technical College and Del Mar College) to TAMUK. Two summer camps were organized at the TAMUK campus. The project suggests the need to promote the training of faculty and staff to better understand the Hispanic cultural context to train Hispanics students and improve their role in their communities.

075

Soft Skills Self-Assessment of Agricultural Communications Undergraduate Students

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Texas Tech University

Research shows it is important for college graduates to possess not only discipline-specific skills, but also skills that are important in any job field, often called soft skills: communications, leadership, teamwork, public speaking, fluency in a foreign language, and a high degree of character, to name a few. Some employers have claimed they will not only hire, but offer higher salaries to, new employees who exhibit these skills. Following a professional development in agricultural communications course at Texas Tech University, a course focusing on job and internship readiness, students took a voluntary soft skills self-assessment. The survey consisted of questions including knowledge of languages, degree of character, and the students' leadership, internship, and job experiences. Nine of the 16 students completed the assessment. Seven students had leadership positions in a campus organization, and five had participated in community service or volunteer activities. A third of the students claimed to have "excellent" teamwork skills. The students also rated themselves to be high in the following character traits: trustworthiness, respect for others, responsibility, fairness, and caring for others. Although some of these skills are difficult to teach, it is beneficial for students to understand how important these skills are to their future employability. Instructors can incorporate team-based assignments to encourage leadership. The instructor required the students to apply for a job or internship, and encouraged participation in on-campus activities. At the end of the semester, all of the students that took the assessment had an internship or part time job.

076

Gender Differences among College Students' Expectations of Instructors, Advisers and Themselves

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Recent reforms in undergraduate higher education have led colleges and universities to focus on retention of students. Understanding student expectations of themselves, their instructors and advisers can lead to improved communication of realistic requirements and demands, hopefully leading to increased student success and overall retention. Undergraduate students classified as freshmen, sophomores and seniors (N = 2889) enrolled in the College of Agriculture and Life Sciences were sampled to examine their expectations in three categories. Participants completed a 64-question, web-based survey. The response rate was 45.03% (n = 1301). Survey questions were placed into categories, including student expectations of college instructors, student expectations of academic advisers, and students' views of what faculty and staff can expect of students and composite variables computed. When asked about their expectations of college instructors, female students reported higher expectation scores (M = 40.47, SD = 3.93) than male counterparts (M = 39.14, SD = 4.43, $t(1077) = -5.20, p = .000$). Similar results were self-reported for students' expectations of advisers (females: M = 54.58, SD = 5.67; males: M = 51.92, SD = 5.94, $t(1061) = -6.87, p = .000$) as well as their view of faculty and staff expectations of them as a student and advisee (females: M = 55.39, SD = 4.43; males: M = 52.98, SD = 5.94, $t(1065) = -7.59, p = .000$). These data suggest that expectations of undergraduate students differ based on gender, with female students reporting higher expectations of themselves, their instructors and their advisers.

077

Motivating Factors for Student Choice of Major

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The purpose of this study was to identify the factors that influence students' choice of major when enrolling in the Agricultural Mechanization & Business and Agricultural Education programs within the College of Agriculture, Forestry, & Life Sciences (CAFLS) at Clemson University. Specific research questions were developed to de-

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termine: 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 that influenced the student's decision. The population for this study consisted of 66 purposely selected freshman and transfer students in the Agricultural Mechanization & Business and Agricultural Education programs which were enrolled in the freshman introductory classes during Fall 2012 and 2013. This study used a qualitative research method. A panel of experts developed the questionnaire. Survey Monkey was employed to collect responses. The findings indicated the most influential individual when choosing a major was the parent/guardian followed by a tie with the high school agriculture teacher and CAFLS faculty. The most important factor motivating the student was the career opportunities available after graduation and the reputation of the program. Furthermore, students are making their final decisions during the second semester of their senior year. The findings suggest that recruiting efforts need to target and communicate with agriculture teachers and parents as early as possible to increase enrollment of high school students.

080

Utilizing Dexterity to Determine Future Performance of Participants in a Welding Training Program

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Iowa State University

This study examined the use of dexterity to indicate future performance of beginning welders to select participants for welding training programs. With a high demand for welders, it is imperative that welding training programs be efficient, which can be time consuming. With a need for skilled laborers, finding a more efficient way of training has become a necessity while maintaining a high level of quality. The time required to train certified welders is one of the obstacles training programs face. Many occupational fields have tried to predict a student's future performance before admitting them into a training program by analyzing their dexterous ability. This study utilized the Complete Minnesota Dexterity Test (CMDT) to examine participants' dexterity during a welding training program. At the end of the training program, participants performed test welds that were evaluated by a certified welding instructor (CWI) who visually inspected each weld who indicated if the weld passed or failed. A

bivariate correlation was calculated using the recorded times and visual pass/fail rates. Effect size was evaluated by calculating Cohen's d. All three dexterity tests were found to have statistical significant relationships with the visual pass/fail rates of the participants for basic shielded metal arc welds (SMAW). It can be concluded that dexterity had a large effect on pass/fail ratings of basic SMAW welds. This implies industry personnel can use dexterity to select people to enter welding training programs that use basic SMAW welds.

082

Utilizing the Agricultural Marketing Resource Center (AgMRC) Website to Increase the Critical Thinking Skills

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Trent Wells
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The need for an agriculturally literate populace is apparent as consumers attempt to navigate their way through a myriad of food, feed, and fiber choices. As agricultural markets have globalized, traditional producers must understand how to adequately address issues regarding the distribution of their products in an increasingly difficult and evolving marketplace. This plight is not lost solely on adult producers and consumers. The forthcoming generation is facing a similar predicament: lack of awareness in and about the agricultural industry. To combat this predicament agricultural education teacher educators are able to utilize the AgMRC website to supplement current curriculum to teach value-added practices. The website is available free-of-charge and is designed to give students the opportunity to learn how to start and maintain value-added practices. The AgMRC website allows students to successfully integrate value-added agriculture practices into an existing operation by teaching how to identify niche markets, create business plans, track market trends, and the correct production practices. Currently, 110 worksheets incorporating data-seeking questions have been developed. The worksheets require students to seek out information to answer various questions pertaining to value-added agriculture. The AgMRC website has the ability to affect the adoption of value-added production through post-secondary agricultural students by assisting both teachers and students by generating ideas set up value-added agricultural projects. The researchers recommend that AgMRC workshops and teacher training be conducted at both state and national agricultural education teacher

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conferences to increase awareness of this effective teaching tool.

083

Using Review Sessions to Promote Student Learning

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Student-centered review sessions (RS) prior to exams provide students an opportunity to better understand the main concepts of the subject. The objective was to determine if students attending question- and answer-based review sessions would perform better on exams and require less time to complete exams than their peers who did not attend the review sessions. Data were collected over 2 semesters from students (n=107) enrolled in a sophomore level Reproductive Physiology course at a major land grant university. Prior to each of the three lecture exams, students had the option to attend a RS the evening (1700 to 1900 hrs) before the exam. Review session attendance was correlated to the exam outcome and time needed to complete the exam. Results from the 2 semesters were analyzed by ANOVA and significant differences between scores and time utilized to complete exam of students attending and their peers who did not were determined by $p < 0.05$. Student attendance at RS averaged 30% for exam 1, 29% for exam 2, and 34% for exam 3. Overall, students who attended the RS performed better ($p = 0.0003$) on the exams than those who did not (76.1 ± 0.98 vs. 69.6 ± 0.98 percent, respectively). Additionally, students who attended the RS took more time ($p = 0.024$) to complete the exams than those who did not attend (65.5 ± 1.3 vs. 62.0 ± 1.3 minutes, respectively). Students who attended RS demonstrated a higher level of learning on the exams and spent more time writing their answers.

084

Impact of Bonus Clicker Points on Final Course Grades

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"Clickers" have been recommended as a tool for increasing student engagement, revealing student misunderstanding, and increasing attendance and accountability. When linked to grades, a recommended practice is to build leeway into the grading system to avoid penalizing students for potential technical problems and to allow for

occasional human failures such as forgetting to bring the clicker to class, responding to questions incorrectly or being absent from class due to illness or extenuating circumstances. Offering more clicker points (i.e., bonus) during the semester than needed for a perfect clicker score is one way to address this recommendation. The objective of this study was to evaluate the impact of bonus clicker points on final course grades. Retrospective data from an undergraduate course taught by the PI for 7 years (2007-2013) were analyzed to determine the number/percentage of students earning A's, B's, C's, etc. when their grades were calculated without/with clicker bonus points. Ninety-one of 991 students (9.2%) improved their grade by a half letter grade from points they earned beyond those required for a perfect clicker score (maximum bonus points: 10). The most frequent improvements were seen in students who went from: A- to A (21; 2.1%), B+ to A- (23; 2.3%), and B to B+ (23; 2.3%). Except for four students (0.4%), there was no grade improvement among students with initial grades of C or lower. These data suggest that providing bonus clicker points improves the final grade for a small percentage of students who are already performing relatively well.

085

Undergraduate Student Perceptions on the Scope of Employment Dynamics within the Equine Industry

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Sam Houston State University

Horses are becoming an increasingly significant segment of the animal industry. As a result, new employment opportunities such as marketing, sales, management, and finance continue to increase in number. The objective of the current study was to evaluate student perceptions on the greatest percentage of industry jobs, which segment they find the most appealing, as well as which courses they believe has been the most successful in preparation for employment. An opinion survey (n=39) was administered to students enrolled in equine science courses. Overall, students (69.23%) indicated they plan to pursue a career within the industry, and they perceived the greatest percentage (38.46%) of available jobs align with training of horses. However, the American Horse Council reported as many as two-thirds of prospective careers have minimal daily contact with horses, but still require a working knowledge of the horses and their industry. Students also specified equine nutrition and health as the most appealing (41.03%) for employment, and stated the current curriculum best prepares

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(66.67%) them for a position in the nutrition and health sectors. The majority of student responses also determined the introductory equine science course was the most beneficial (41.03%) for success in the industry. In contrast, business, management, marketing, and sales had minimal student interest (0 to 5.13%) to be included as part of curriculum as well as potential employment opportunities. Therefore, institutions may need to not only educate and train students to work with horses, but also increase their knowledge of dynamic changes in the equine industry.

086

Creating a Class in Leadership for Agriculture and Rural Communities

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Virginia Tech

The faculty of Virginia Tech's Agricultural Technology Program developed a leadership course specifically for an Associate's Program in agriculture. Faculty identified the class as a need prior to fall 2013 semester. With funding from the Virginia Tech Center for Instructional Development and Educational Research (CIDER), they formed a Faculty Study Group with faculty from CIDER and Agricultural and Extension Education. The group began discussion, planning, and implementation of the course to begin Spring 2014. The group believed the course needed to be specific to agriculture and maintain Ag Tech's commitment to highly applied learning with real-world skills. The group also believed the course should enable and encourage students to take up leadership roles in their home rural communities. The Leadership in Agriculture and Rural Communities class was formed as a Special Study for spring 2014 with 11 second-year students enrolled. It emphasizes increasing students' abilities and willingness to serve in leadership roles in three areas: business, government, and community and industry organizations. The course began with helping students assess their leadership qualities through StrengthsQuest and KAI. The class also featured on guest speakers who are leaders in agriculture and rural communities. In addition, the students traveled to a conference where they met with many leaders in business, government, and industry organizations. The students were then guest speakers in another Ag Tech class and shared what they learned at the conference. The faculty plan to continue to offer the course and evaluate and improve it for future students.

087

Retention, Persistence, and Completion Strategies: A Comparison of USDA-HSI Grant Students to the General Hispanic Student Population

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Texas State University

Recruitment and retention of Hispanic students in agricultural and related sciences has been historically challenging due to a variety of factors. Perceptions of these fields, prior knowledge levels, family background, and various social and academic elements all contribute to the overall effectiveness of institutions in retaining Hispanic students. Efforts to create new and innovative strategies to entice this ever increasing population into degrees and careers in these fields have been a growing point of focus for educational institutions across the country. This project aims at determining what retention practices employed by USDA-NIFA HSI grant funded students are most successful in helping students persist through completing a four-year degree and comparing the results to other Texas State students who are not part of the grant. Multiple focus group sessions were conducted with grant students where qualitative responses were used to generate a quantitative survey instrument that could then be distributed to other Texas State students. This instrument served to compare different factors affecting Hispanic students' willingness and ability to persist to graduation and what elements are most significant in contributing to student success. Results from these data can be used as a model for other institutions of higher education wishing to achieve outcomes of effective Hispanic student retention in agricultural and related science degrees.

088

Innovative Teaching Approaches for "Wicked Problems"

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Climate change is considered to be the most challenging global issue we will ever need to address. It is a political issue, an information/uncertainty challenge, and an agenda item for public discussion. With this backdrop, our objective is to understand preferred innovative teaching methods and practices that graduate students,

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researchers, and instructors can incorporate that simultaneously deal with science-based research and value-laden perspectives. Sorting through approaches for such a platform has been the thrust of the Graduate Education in the Economics of Mitigating and Adapting to Climate Change Program. Two pathways are pursued for presenting economic thinking to undergraduate students. The first is an undergraduate module for an introductory course on Environmental and Resource Economics (developed by NNF fellows), where the course title does not explicitly contain the words "Climate Change". This broader approach is used to explain many of the challenges of modern developed and developing economies facing resource constraints. Thus climate change is presented as a continuum for environmental and resource challenges we as a society have addressed. A second undergraduate course on Climate Change Economics and Policy has been developed, where the title features "Climate Change" in a very prominent way. The focus is on climate change policy development, while the economics is secondary. Each course has two common learning outcomes, so the comparisons are with respect to data that will be collected regarding course enrollment, diversity of majors, and student self-assessment of learning with respect to climate change.

089

Increasing Learning about and Enrollment in Horticulture through the Floral Plant Giveaway Project

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North Carolina State University

Recruiting horticulture students has been a nationwide challenge recently. Enrollment in Horticultural Science at NC State dropped from 190 in 2007 to 130 in 2012. Low enrollment in horticulture programs is likely the result of misconceptions held by students regarding horticulture and a lack of knowledge concerning this field of study. In the fall of 2012 and 2013, the Floral Plant Giveaway Away Project (FPGAP) was implemented to grow awareness of horticulture and career options in the discipline through the distribution of plants to freshmen who were undecided as to their major in the First Year College (FYC) program. Horticulture students gave a short presentation on the department and their career plans before giving plants to FYC students. FYC students were surveyed at that time and at the end of the semester about how they perceived the effects of the plant and whether it impacted their interest in horticulture. Survey results show many students in the FPGAP visited the department's website, developed interest in taking a horticulture course, and decided to pursue a horticulture

certificate, minor, or major. Tracking of how many FYC students enrolled in courses or programs in the department is underway, but 11 more FYC students took horticulture classes in spring 2013 than in the spring 2012 prior to the start of the FPGAP. As we continue to collect and analyze data and repeat the FPGAP, we hope to more strongly establish the influence it has on FYC students' awareness of and participation in horticulture.

090

Growing a Canoe Plant Garden for the Elementary Students and College Students; Connecting Food, Culture, Health and Environment into the Hawaiian Cultural Framework of "Ho`Ozulu," the Active Process of Growth in All Areas of Ecological Literacy

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Pattie Andrade-Spencer, Debra Cheever-Follett
Hilo Union School

BIG IDEAS, proposed by Pollan examined four essential values for developing alternative pathways in education K-12. The four values of food, culture, health and environment bring forth fundamentals that support and encourage ecological literacy. Through the Alaskan Native and Native Hawaiian Serving Institutions grant, UH-Hilo founded and supported three projects that help develop these concepts of Ecoliteracy. We have initiated these projects under the theme Ho`oulu, which in Hawaiian means to actively grow. Demonstrated much like a plant, it starts as a seed, sprouts roots, and thrives. To plant the seed we started working with the Hilo Union 4th and 5th grade social science and health classes. These classes built and cultivated a garden to grow canoe plants, while exploring the origins and production of food. As these seeds sprout roots, we expanded our project to the Hawaiian speaking dormitories at the University, working to shape a garden that incorporates food plants and medicinal plants to encourage interaction between language and culture. In the cultivation of strong roots, supported through culture, develops the plant, the UH-Hilo Agriculture Club. This diverse cohort, all with different specialties within the Agriculture Program produced a business plan and is cultivating one acre of land to establish a farm that relies upon the accumulated knowledge, skills, and principles gained from the college. In a collaborative effort Ho`oulu encompasses holistic practice, to implement traditional knowledge and sustainable methodologies to grow the land and its farmers.

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In full circle, each project embodies the BIG IDEA of Ho`oulu.

092

Investigating Factors that Influence Achievement Goal Orientation in Undergraduate Agricultural Students

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University of Tennessee

Goal orientation can aid in explaining/predicting behavior in academic settings. This inquiry sought to determine the influence of academic efficacy, academic self-handicapping, and skepticism about the relevance of school for future success on achievement goal orientation (mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance). The Achievement Goal Questionnaire–Revised and the academic efficacy, academic self-handicapping, and skepticism scales from the Patterns of Adaptive Learning Scales were completed by 303 undergraduate students in a college of agriculture at a southern land-grant university for a 24% response rate (N = 1,286). The sample was skewed towards females; therefore, the data were weighted based on the population parameter. Also, a Tobit regression was used. Parameter estimates for academic efficacy ($\beta_{AE} = 0.36$, $p < .05$) and self-handicapping ($\beta_{SH} = -0.15$, $p < .05$) significantly predicted mastery-approach. Additionally, parameter estimates for academic efficacy ($\beta_{AE} = 0.27$, $p < .05$; $\beta_{AE} = 0.29$, $p < .05$) significantly predicted mastery-avoidance and performance-approach, respectively. Skepticism was not a significant predictor of achievement goal orientation. Consistent with goal theory, academic efficacy positively influenced achievement goal orientation. Instructors should be cognizant of this and that self-efficacy mediates achievement gains. Therefore, instructors should judiciously provide academic feedback that supports achievement motivation and skill acquisition. Moreover, self-handicapping negatively influenced mastery-approach. This indicates handicappers focus less on mastery learning and more on normative competence. Instructors should also consider this when providing achievement feedback. However, the knowledge base regarding how instructors positively or negatively influence self-handicapping is sparse. Thus, future research is warranted and should seek to reduce the behavior.

093

New F.A.C.E.S. (Fostering Agricultural Communication and Extension Students) – A USDA-HEMSP Supported Project at Cornell University

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Cornell University

The Cooperative Extension system delivers research-based knowledge from universities to a very diverse public. Unfortunately, traditionally underrepresented groups are even more underrepresented in extension education positions. There is need to train high quality multicultural agriculture-related extension educators. Thus, the overarching goal of this project was to increase the diversity of extension personnel and professionals working in extension-related roles in American agriculture and agri-business. Specific objectives were to: (1) recruit 11 transfer students from underrepresented groups into one of Cornell's Food Science, Agricultural Sciences, Viticulture and Enology, Agribusiness, and Food Industry Management undergraduate programs; (2) provide academic advising, career mentoring and personal counseling to ensure these scholars successfully complete a BS degree; and, (3) assist graduates in securing professional positions in extension education. The scope of this project matches the USDA-HEMSP purpose "to provide scholarships to support recruiting, engaging, retaining, mentoring, and training committed, eligible multicultural scholars ... that would lead to a diverse and highly skilled work force..." in food, agriculture and related science disciplines. We assembled a multidisciplinary mentoring team to offer an outstanding education integrating scientific research, experiential opportunities, and soft-skills development, while providing a supportive academic environment. Currently, four students are supported, with active plans to recruit more for fall 2014. All four are female, one Hispanic, one Native American and two African American; two in Food Science and two in Agricultural Sciences. Two students are conducting undergraduate research and three have secured internships. Overall, students are making progress both academically and professionally during the first year.

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094

Agriculture Undergraduate Interns Reflect on Their Research Internship Experiences

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University of Maryland Eastern Shore

F. Eivazi
Lincoln University

Undergraduate research internships can help students develop research, disciplinary, and soft skills as they prepare for the job market and graduate schools. As such, agriculture majors at the University of Maryland Eastern Shore and Lincoln University were engaged in research through two funded grants to improve their skills in sustainable agriculture and preparation for graduate school. With the goal of assessing students' perceptions of these programs, we surveyed interns who had completed their two-semester paid internships with faculty mentors and received 13 responses. The survey of 14 questions, including one for open ended comments, was related to skills and knowledge in communication, critical thinking, workforce preparedness, and research and the duration of and willingness for unpaid internships. On a scale of 1-5 where 1 was strongly disagree and 5 strongly agree, the interns strongly agreed that working with a mentor helped them develop their skills; agreed they had improved their skills in communication, critical thinking, workforce preparedness, and research; and were neutral to agreeing that two semesters were adequate for their internship or that they would still participate if unpaid. Their most common comments were that the techniques and workforce preparedness skills helped them find other internships and jobs, and their communication skills and self-confidence increased. The implications from this survey are that agriculture majors are benefiting from these research internship programs and; therefore, these programs should be continued in order to prepare more agriculture students to compete in the global market.

095

Investigating Soft Skill Development in an Agricultural Leadership Course

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Mississippi State University

Leadership courses are recognized as beneficial to students' soft-skill development. Soft-skills include: leader-

ship, communication, decision making, problem solving, self-management, professionalism, and teamwork. Crawford, Lang, Fink, Dalton and Fielitz (2011) identified seven Soft Skills Clusters. The seven clusters include the skills listed above and "Experiences." Each cluster has seven specific items under it for a total of 49 individual soft skills. Students in the agricultural leadership course "Professional Presentations" course were asked to complete a questionnaire to assess their perception of the soft skills they developed in the course. The instructor developed the questionnaire that was administered at the end of the semester as an evaluation tool to investigate the concepts students were identifying as learned and those that should be further enhanced. Qualtrics was used to collect student responses (who were given extra credit for completing the instrument). Students responded to the following question: "Reflecting on only this course, indicate how well it developed your skill level in each of the following characteristics." On a scale from 1 = strongly disagree to 5 = strongly agree students rated all of the seven cluster areas with a mean of 4.17 or higher. The highest rated cluster was Teamwork Skills (M= 4.40). All the areas were very high and may not truly reflect the actual skills gained in the course. The survey will be administered again at the conclusion of the spring semester of the course. There are also plans to administer it in additional agriculture courses.

096

Summer Enrichment Programs: A Tool to Increase Enrollment in Agriculture at Virginia State University

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Virginia State University

In an era of complex challenges for higher education and traditional Departments of Agriculture at land-grant institutions, enrollment in Agriculture is increasing at Virginia State University (VSU). Summer enrichment programs (SEPs) have become an important tool at VSU to recruit rising high school juniors and seniors to the Department of Agriculture. Program details are being shared so that other institutions might incorporate some aspects successfully into their own academic programs. The SEPs have evolved from one to two cohorts of the five-day program to now accommodate up to thirty students. The program now includes an overnight stay on campus to more fully expose participants to college life. Participants are exposed to the various concentrations offered in Agriculture at VSU: Agricultural Business & Economics, Animal Science, Pre-Vet Medicine, Aquatic Science, Environmental Science, Plant Science, Horticulture, and Agricultural Education. The students are exposed to

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classroom, laboratory and on-farm activities, field trips, and team-building exercises. The SEP includes interactions with a diverse set of faculty and undergraduate students, along with faculty/staff from Cooperative Extension and the Agricultural Research Station. The SEP has financial support from the College of Agriculture and grants, so students attend free-of-charge, and several are awarded modest scholarships to offset tuition at VSU. Participants gain an enhanced understanding of how relevant agriculture is to their daily lives, and how agriculture relates to economic, social and environmental issues. Just as importantly, many develop an appreciation of the diversity of agriculture-related areas of study and career opportunities.

097

Women and AET: A Review of the Literature

Matt Spindler, Althea Whitter-Cummings,* Amy Vu,* Courtney Vengrin,* Donna Westfall-Rudd and Rick Rudd
Virginia Tech

The lives of women are manifested within multiple personal, familial and societal roles. It is clear that efforts aimed at resolving the challenges faced by women in performing one or more of their roles will fail if the inequities, barriers and challenges that women face are not fully understood and addressed. Given the key role of women in the global agricultural sector, improving their condition means advancement for the sector and social justice simultaneously. A systematic review of the existing literature regarding women and Agricultural Education and Training (AET) was carried out in order to distill knowledge from past experiences while gleaning the most robust recommendations for future work. Since women play a critical role in the agricultural industry, over the past two decades much research has been intentionally concentrated on the acknowledgement and liberation of women in agriculture. The efforts have been primarily placed on identifying and removing gender barriers and or biases in an attempt to recognize and establish women in agriculture as scientists, teachers, extension/program agents and global agents of change. Across the globe, though women continue to play significant roles in agriculture, they face more severe constraints than men in access to productive resources. However, as the agriculture sector has been reinvigorated as a vehicle for sustainable development, women have become more visible within AET systems and it is critical that social justice for women is included as a critical facet within agricultural subject pathways.

098

Assessing Morale of Agriculture Education Teachers at the State Level

Marcus Stephen Pollard
University of Georgia

Teacher shortages are a real concern for all fields, but particularly for agriculture education. Kantrovich identified many teachers leave prior to when they reach retirement. While many school systems focus on recruitment of highly qualified teachers, the focus should be on retention of current teachers. The Human Capital Theory states that teachers build up capital within their job and that the more capital a teacher has, the more likely they are to remain in their current position. Capital is comprised of family commitments, job expectations and relationships with co-workers. This study uses Hoy's Organizational Health Survey to measure morale of agricultural education teachers in Georgia in an effort to contribute to understanding relationships with co-workers. In this presentation, participants will: (1) learn how to assess morale for agriculture education teachers and (2) how to use morale scores to help with teacher retention.

099

Inter-Institutional Interest in Developing an Online Commodity Merchandising Certificate Program

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University of Missouri

Haluk Gedikoglu
Lincoln University

A key motivator to develop collaborative programs is the presence of inadequate resources within a single institution. As the field of agricultural economics has exploded into many subfields of study, teacher critical mass in traditional learning areas has eroded. This has been especially true for the loss of commodity merchandising courses, and there is likely to be an enormous demand for commodity merchandisers due to the aging cohort now serving that role. This research reports on methodology for assessing inter-institutional teacher interest in developing a joint, online commodity merchandising certificate program, within the Great Plains Interactive Distance Education Alliance (IDEA) platform. We concluded the importance to explain the Great Plains IDEA collaboration platform, to assess the availability of courses at

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each institution, and to collect opinions on what resources each institution will have available in the upcoming 5- and 10-year intervals. We also assessed whether teachers found the Great Plains IDEA as overstepping institutional boundaries, or as an opportunity to better serve student and industry needs.

102

Distance Learning can Increase Multicultural Experiences for Undergraduate Students

Kevin Gibson, Tamara Benjamin, Bridgett Chapin and Chris Oseto
Purdue University

Enrollment in study abroad has increased substantially during the last few decades; however, minority participation in study abroad has not kept pace with this growth. To address this need, we delivered a synchronously taught undergraduate course on sustainable agriculture to students at Haskell Indian Nations University and at Purdue University for three semesters in preparation for a two-week field trip in Costa Rica. Students participated in three lectures, reciprocal campus visits, and a project in which each student interviewed two to three adults about their perspectives on the sustainability of U.S. agriculture. Quantitative and qualitative data were used to determine student engagement and program assessment. As measured by the number of comments and questions posted during the lectures, Native American males were particularly engaged by course content. The interest of Native American males in working in multicultural groups also increased significantly during the semester although no differences were detected for Purdue males or for women at either institution. Students emphasized the importance of the reciprocal visits and projects for getting to know each other outside the classroom. Our results suggest that students from culturally diverse institutions can be engaged during synchronously taught courses using distance-learning technologies.

103

Development of a Community-Based Companion Animal Curriculum

Amy Fischer
Illinois State University

The American Pet Products Association estimates that Americans will spend \$58.5 billion on their companion animals this year; this annual figure has steadily increased in the face of other national economic setbacks.

Undergraduate students who are exposed to companion animal-related programs will be well-suited to explore career opportunities within this diverse and growing industry. The incorporation of companion animal species into traditional Animal Sciences departments is a relatively recent endeavor. While many departments typically have production animal species available on campus for teaching purposes, few have companion animal species that are available to the students. To creatively address this challenge, the University of Illinois Animal Sciences Department has woven a network of community teaching partners into its curriculum. Through formal relationships with local humane organizations, students are offered a rich array of experiential learning opportunities. Examples of such opportunities – including internships, field trips, laboratory activities, and faculty-guided student outreach - will be shared as a model for other departments that may be interested in expanding their own companion animal programs.

106

Using Student Temperaments to Impact the College of Agriculture Planning and Advising

Ashley L. Powell,* Carl Igo and Shannon Arnold
Montana State University

For years, institutions have been concerned about student retention. However, no studies had been conducted on what significant ways student temperament could be used to positively impact the retention of first-time, full-time freshmen students within the College of Agriculture at Montana State University. The purposive sample for this study included only students who met the study's specific criteria. Descriptive quantitative in design, inferential and descriptive nonparametric statistics were used to explore the data set for relationships and statistical significance between pre-college scores and the two study instruments—the Beginning College Survey of Student Engagement and Real Colors®. Results showed that Orange was the largest primary, and equally Gold and Blue secondary were the largest temperament groups. Gold and Green students were concerned about making friends. Concern in engaging with instructors and paying for college was present in the sample. Males were concerned with time management skills. The expectation was to spend 21-30 hours preparing for coursework each week. Temperament was not correlated with retention to the second fall semester in college. Recommendations were that retention programs and course study groups focus on gathering students struggling in a course or multiple courses. Scholarship and other financial services that assist in paying for college should be well publicized to students. Instructor and ad-

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visor should be aware of the different ways in which different temperaments perceived first-year course load. Instructors should keep course assignments practical; relate course material to industry jobs; provide hands on activities; and encourage big picture thinking.

107

Innovative Products to Support Instruction and Retain Students in Soil and Environmental Sciences

April Ulery,* Barbara Chamberlin, Sheila Cassidy and Jeanne Gleason
New Mexico State University and Wexford, Inc.

ScienceofSoil.org includes free learning modules designed specifically to enhance science and math concepts important in soil, plant and environmental sciences. The animations, video modules and interactive tools address specific topics that are frequently misunderstood by students. Deficiencies in STEM-related skills (science, technology, engineering and math) deter many students from completing coursework in math and science-intensive agricultural and environmental majors, thus decreasing the number of potential graduates in these fields. Interviews with agricultural faculty and employers in STEM-related fields generated a list of challenges facing new graduates and the learning objectives needed to address student deficiencies. The team created several educational animations and modules, testing the modules with learners throughout the process. The modules address unit conversions, graphical interpretation, working in three dimensions, and understanding the interconnectedness of coursework to STEM majors. An interactive module demonstrates how to read dose-response graphs, and then has the student answer questions about plant response to varying levels of salinity, boron and nitrogen. To address confusion about dimensional analysis and unit conversions, an animation shows how the three dimensions in soils relate to units. An animation and an interactive module help students understand why log scales are used, how to read log scales, and how to calculate logs. We also produced video interviews of alumni, managers and scientists to encourage students facing common challenges in college. The multimedia learning products have been integrated into coursework at NMSU; pre- and post- tests assessed changes in content knowledge of the students after using in courses over a semester.

108

Student Perceptions of Food Animal Agriculture Issues Before and After Interactive Discussions on Challenging Topics

Daniel H. Poole and Jeannette A. Moore*
North Carolina State University

A new lab on Contemporary Issues was created for the Intro to Animal Science Lab (n = 50 students), and pre- and post- surveys were used to evaluate efficacy and student perceptions. Students had two pre-lab reading assignments outlining challenges related to food production and the increasing human population. In class, pictures and a controversial video were used to stimulate discussion on food animal welfare, current issues in animal agriculture, and food production. Students worked in small groups to discuss these topics and their summaries were presented to the rest of the class for open discussion. Answers to questions were "not at all" (score 1) to "very much" (score 5). Four topics increased in score ($P < 0.05$): "How concerned are you about our ability to feed the growing human population?" (3.8 pre to 4.1 post), "How aware are you of current issues facing animal agriculture?" (3.0 to 4.1), "Can you describe the differences between Animal Rights and Animal Welfare?" (3.6 to 4.5), and "Do you consider the U.S. food supply to be safe, wholesome, and nutritious?" (3.3 to 3.8). At the end of the lab period, students indicated their understanding of what is considered poor animal husbandry changed (3.7, $SD = 0.90$) and they had a better understanding of how animal agriculture interacts with the environment (4.3, $SD = 0.68$), antibiotic usage in animal agriculture (4.3, $SD = 0.65$), and hormone usage in animal agriculture (4.3, $SD = 0.73$). Instructor interpretation of the assessment is that the new lab was successful in stimulating student understanding of important issues facing animal agriculture.

109

Assessing Students' Awareness of Academic Misconduct Policies & Procedures

Timothy Bradford Jr.* and Gaea Hock
Mississippi State University

Research has shown that academic dishonesty is a growing trend that threatens the integrity of many universities. Implementing an Honor Code is one way to deter academic misconduct; however, dissemination of this information to the student body is fractured and sometimes ineffective. Currently, Mississippi State Uni-

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versity is the only public university in Mississippi that has an Honor Code. The Honor Code at MSU was enacted in 2007 to discourage academic misconduct among students. Academic misconduct according to MSU includes, but is not limited to: cheating, fabrication, falsification, plagiarism, and complicity. The objective of this study was to gain a sense of student awareness and perceptions of the Honor Code. A presentation on the Honor Code was given to 51 total students in two undergraduate courses in The School of Human Sciences. After the presentation, students were asked to identify three things they were not familiar with concerning the Honor Code prior to the presentation. Each student's responses were transcribed and grouped into major themes. These major themes were: an unawareness of Honor Code implementation, what academic misconduct consisted of, what could and could not be cited, what percentage of the student body violates the Honor Code the most, and how to correctly cite information. Student responses indicated an increased awareness of violation sanctions, strategies to avoid academic misconduct, and student resources available on campus for improvement of their writing. Further research should be conducted to determine the best strategies for disseminating information on the Honor Code to the student body.

111

Methods for Effective Undergraduate Research: Case Study

Brian J. Pearson* and Kimberly A. Moore
University of Florida

Undergraduate research facilitates the development of analytic and critical thinking skills and positively influences academic achievement and retention. However, differences in benefits gained from research experiences are dependent upon program structure and student involvement. Guidelines vary among departments and universities. We have found that to maximize achievement of learning outcomes resulting from undergraduate research, greater focus on skill development through a learner-centered approach is necessary. Research experiences should emphasize development of synthetic thinking, enhancement of written and oral communication, and the ability to work as a member of a peer-based team. To achieve these goals, a sense of project ownership and independence should be instilled at the commencement of the research project. Students should be responsible for all research related tasks, not simply those requiring labor. Collaborative efforts involving inter- and intra-departmental faculty and graduate students should be utilized to foster written and oral communication skills while providing for enhanced under-

standing and appreciation of a peer-based team research approach. Synthesis of research results leading to development and dissemination of research findings at a professional meeting should be used to further enhance communication skills and provide students with a perspective of the scientific process not easily visible from the laboratory.

113

Evaluation of Method to Measure Student Ability to Prioritize New Information on Bioenergy Crops

Eric Anderson and D.K. Lee
University of Illinois

A course in bioenergy crops was developed and offered from 2009 to 2013 at the University of Illinois, and this subject area was believed to be largely new to the students. Prior to taking a midterm exam, students were asked to identify ten specific topics they felt were central to the content presented up to that point and therefore would likely be the subjects of questions on the exam. Their topics were then compared with the actual exam questions and the percentage of content overlap (overlap) was calculated. The goals of the study were to measure the students' ability to categorize and prioritize new information, and determine correlations between that ability and the outcomes of evaluation methods. The overlap ranged from 10 to 68% with a mean of 36% with no trend over the 5-year time span. Pearson product-moment correlation was conducted between the overlap and the midterm and final exam scores and the overall semester grade. The overlap was positively correlated with the midterm exam grade ($R=0.4077$, $P=0.0004$) but was not correlated with the final exam grade ($R=0.1400$, $P=0.2477$). There was a 5% improvement from the midterm to the final exam on average with a range of +35 to -14 with no trend over the 5-year time span. There is a high level of variability among students' ability to organize and prioritize new information. The overlap-styled assessment will not likely accurately predict student comprehension and retention of new information without repeated practice.

114

Predicting Instructor Quality in Undergraduate Agriculture Courses Using the IDEA Survey

M.J. Anderson, J.L. Lucia, K.J. Stutts, M.M. Beverly and S.F. Kelley
Sam Houston State University

The Individual Development and Educational Assessment (IDEA) survey is a mechanism that uses student feedback to assess and improve teaching, learning, and the higher education process. The IDEA survey contains questions pertaining to course objectives, teaching methods and styles, and descriptions of the course with the goal of determining the quality of the instructor and overall course. The objective of this study was to determine which survey questions were most important when predicting the quality of the instructor in undergraduate agriculture courses. A step-wise regression analysis was performed on data from 1,081 courses spanning a six-year period. Thirty-five of the 43 questions on the survey were included in the analysis. Eight questions were not included in the analysis because they involved students' preconceptions that could not be affected by the instructor during the course. This analysis indicated that 15 of the 35 questions entered into the model were significant and these questions had an r^2 of 0.8322. The top questions with positive relationships towards predicting the quality of instructor were: 1) the instructor explained course material clearly and concisely, and 2) the instructor displayed a personal interest in students and their learning. Additionally, five questions had negative relationships when predicting the instructor quality. These questions should have positive relationships based on the manner in which the questions are written. Therefore, reevaluating those areas that students view with negative or strong positive relationships can aid instructors in improving their overall teaching quality.

115

Predicting Overall Course Quality in Undergraduate Agriculture Courses Using the IDEA Survey

M.J. Anderson, J.L. Lucia, K.J. Stutts, M.M. Beverly and S.F. Kelley
Sam Houston State University

The Individual Development and Educational Assessment (IDEA) survey is a mechanism that uses student feedback to assess and improve teaching, learning, and the higher education process. The IDEA survey contains

questions pertaining to course objectives, teaching methods and styles, and a description of the course with the goal of determining the quality of the instructor and overall course. The objective of this study was to determine which survey questions were most important when predicting the quality of an undergraduate agriculture courses. A step-wise regression analysis was performed on data from 1,081 courses spanning a six-year period. Thirty-five of the 43 questions on the survey were included in the analysis. Eight questions were not included in the analysis because they involved students' preconceptions that could not be affected by instruction during the course. This analysis indicated that 10 of the 35 questions entered into the model were significant and these questions had an r^2 of 0.7483. The top questions with positive relationships towards predicting the quality of a course were: 1) that students gained factual knowledge, and 2) the instructor involved students in hands on projects or real-life case studies. Additionally, four questions had negative relationships when predicting the quality of a course. These questions should have positive relationships based on the manner in which the questions are written. Therefore, reevaluating those areas that students view with negative or strong positive relationships can aid instructors in improving their overall course quality.

116

Relationship between IDEA Scores and Grade Distribution in Agriculture Classes

M.J. Anderson, M.M. Beverly, S.F. Kelley, J.L. Lucia and K.J. Stutts
Sam Houston State University

The IDEA survey uses student feedback on questions pertaining to course objectives, teaching methods, and descriptions of courses with the goal of determining the quality of the instructor and overall course. However, it is commonly believed that the grade a student earns in a course will affect their evaluation of the course and their instructor. Therefore, the objective of this study was to investigate the relationship between excellent teacher score (Tscore), excellent course score (Cscore), and the grade distribution in agriculture courses. To achieve this, two statistical techniques were used. First, correlations were run between Tscore, Cscore, and the course GPA. Secondly Tscores and Cscores were categorized in 0.5 point increments. The percentage of As, Bs, Cs, Ds, and Fs were then compared across these 5 distinct groups (2.5-2.9; 3.0-3.4; 3.5-3.9; 4.0-4.5; and 4.5-5.0) for both Tscore and Cscore. GPA was not strongly correlated with Tscore ($r=0.20$) or Cscore ($r=-0.04$), indicating that GPA was not a key factor in either evaluation. This is

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further seen when comparing the grade distribution across Tscore and Cscore categories. For Tscore, differences were detected across the different categories. However, the lowest Tscore group (2.5-2.9) was not different ($P>0.1$) when compared to the highest Tscore group (4.5-5.0) in the percentage of As, Bs, Cs, Ds, or Fs. The same effect is seen when comparing the highest and lowest Cscore groups. From this study we can then conclude that there is not a consistent relationship between grade distribution and student evaluations of the course and their instructor.

117

Identifying Graduate Student Needs through a World Café Discussion

Caroline Glagola Dunn* and Jessica Holt
University of Florida

The purpose of this study was to evaluate the needs of graduate students within a College of Agriculture and Life Sciences as they relate to student experience, satisfaction, and career readiness. Students and faculty members ($n=24$) participated in a World Café discussion session at a Teaching Enhancement Symposium held in August 2013. Participants seated in interdisciplinary groups took part in two separate discussions. The first discussion focused on needed resources to enhance graduate student experience and preparation for professional life. Participants rotated to create new groups and contribute to a second discussion focused on balance between personal and professional activities. Notes and transcripts from the session were collected by trained research staff and were analyzed for common themes. These themes included increased need for financial advising and counseling, a desire for increased inter- and intradepartmental collaboration, a need to increase awareness among faculty advisors about the importance of a balanced career and personal life, a need for organized outside activities and social opportunities, and a desire for increased experiential learning through immersion opportunities. These findings suggest a need for intentional, well-publicized activities within departments to assist graduate students as academicians and future professionals. These interdepartmental programs could focus on time and money management, organized socialization, and encourage interdisciplinary collaboration, research, and extension. Based on these findings, it is our recommendation that more research be conducted into the needs of graduate students in large Colleges of Agriculture, as well as into the current academic and social environments in which they work.

119

When and Why do Students Decide to Major in Agriculture?

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University of Tennessee

Knowledge of when and why students choose college majors can help universities in their recruitment efforts. To examine the factors that influence students when choosing a college major and career path, a questionnaire was administered in August 2013 to 128 freshman students who are majoring in agriculture at the University of Tennessee at Martin. Responses were summarized and Fisher's exact test was used to determine if relationships among variables were significant. When asked what factor most helped them in choosing a major, 27% of respondents indicated that family was most important. This was followed by a career that was personally rewarding (20%) and FFA/4-H experience (19%). Overall, 55% of respondents grew up on a farm and 60% are female. Gender was related ($P < 0.0001$) to career choice, primarily due to the high percentage of females (85%) who would like to become veterinarians or veterinary technologists. Thirty-nine percent of students decided on their college major in their senior year of high school, but 25% of respondents had decided on their major in junior high. There was a relationship ($P < 0.0001$) between planned career path and when students decided on their major. Of students in the veterinarian or veterinary technologist group, 50% had made their decision while in junior high. Within other career groups, the majority of students had not chosen their major until they were seniors in high school. Therefore, family, past experiences, and career aspirations continue to be important factors when students choose their college majors.

121

Academic-Related Perceptions, Beliefs, and Strategies of Undergraduate Agricultural Students

Christopher N. Boyer* and Christopher T. Stripling
University of Tennessee

Studies have shown students' academic-related perceptions, beliefs, and strategies are critical in their academic success; however, little is known about these personal factors in undergraduate agricultural students. The objective of study was to describe undergraduate students' academic efficacy (AE), academic self-handicapping

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(SH), and skepticism about the relevance of school for future success (SR). Three scales from the *Patterns of Adaptive Learning Scales* were used to measure AE, SH, and SR. All scale items asked respondents to rate their level of disagreement or agreement (1=*strongly disagree* to 5=*strongly agree*). A total of 303 usable responses (N=1,286) were collected for a response rate of 24%. The distribution of the sample was skewed towards females; therefore, the data was weighted based on the population parameter. The weighted-averages were 4.17 for AE, 1.67 for SH, and 2.01 for SR. Correlation coefficients were calculated to determine how the constructs were related. AE was negatively ($p \leq 0.05$) related with SH and SR, and SH was positively ($p \leq 0.05$) related to SR. Students believe they are capable of doing their academic work, do not self-handicap themselves, or doubt the relevance of their degree. The rising popularity of agricultural degrees and the shortage of agricultural scientists may explain the lack of skepticism about their degree. These findings are also promising since social cognitive theory postulates personal factors influence behavior and environmental events. Therefore, instructors are encouraged to move beyond typical lecture-based instruction and challenge their students at higher cognitive levels that allow students to realistically explore the complexities of agriculture.

122

Impact of Background Experiences on Student Performance in Introductory Animal Science Management Courses

E.L. Karcher,* M. Ladoni and K.S. Chambers
Michigan State University

An increasing number of undergraduate students are enrolling in the Animal Science (ANS) major with limited interaction with agricultural animals. The background experiences of students may impact performance in introductory animal management courses and provide information to assist in course development and design. Therefore, the objective of this study was to determine if previous experiences impact student performance in introductory ANS management courses. A survey was developed and administered in Fall 2013 to 236 students enrolled in at least one of five introductory management courses (dairy, horse, swine, avian, and companion animal). The 18 item survey included demographic variables and evaluation of previous experiences related to agriculture. Instructors submitted final course grades at the end of the semester. Females comprised 78.6% of survey respondents. Freshman and sophomores represented 62.3% of the students and 64.6% identified their major as ANS. The remaining 35.4% had either not yet

declared a major or did not identify ANS. The majority, 78.5%, did not take agricultural courses in high school and only 34.5% grew up on a farm. A limited number of students (30.7%) had taken previous animal science courses. Not surprisingly, senior students received higher scores compared with freshman students (85.7 vs. 79.7%; $P < 0.0001$). Hometown, number of previous ANS courses, and high school agricultural courses were significant, but had limited practical importance. Overall, student backgrounds does not appear to impact performance in introductory ANS management courses.

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Demographic Profiles and Critical Thinking Ability of Undergraduate Students Enrolled In Introductory Animal Science at a Hispanic Serving Institution

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New Mexico State University

Like many programs, the Animal Science department at New Mexico State University has witnessed changes in the typical student enrolling in the program. Previous animal experience is shifting away from traditional live-stock, as many of our students grow up in urban areas. Understanding the type of students entering the program is essential to their success and establishing future direction of our department. This study aimed to establish a demographic profile of animal science students enrolled in Introductory Animal Science and ascertain a baseline critical thinking score for each student utilizing the Watson-Glaser Critical Thinking Appraisal (WGCTA) exam from Pearson. Students (n=164) enrolled in Introductory Animal Science were given a questionnaire and WGCTA exam during the first week of classes in a fall semester. Students were primarily female (73 %), freshman (68 %) and Hispanic (64 %). Most students (87 %) indicated experience with small animals, 60 % of students indicated experience with large animals, and 6 % of students indicated no previous animal experience. Average WGCTA exam score for all students was 45.8 ± 7.9 on an 80 point scale. Findings indicate that gender, age, and previous animal handling experience have no correlation to critical thinking ability ($P > 0.37$). Higher student classification and greater high school GPA are positively correlated to critical thinking ability ($P < 0.03$). Since they often differ from a historically traditional student, a better understanding of the current students entering the animal science program is essential to direct the future of our department and curriculum.

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Chemistry Preparedness of Animal Science Undergraduates Enrolled In Animal Metabolism

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Many students lack conceptual understanding of crucial scientific processes needed to be successful in obtaining an animal science degree. Ultimately, many students do not grasp important chemistry concepts during high school, or fail to gain those skillsets during large, gateway chemistry courses that act as a filter for students. We intended to determine chemistry preparedness of undergraduate students enrolled in an animal metabolism course (inorganic chemistry is a pre-requisite). Students completed an instructor designed pre- and post-test to determine pre-requisite chemistry knowledge. The test consisted of 29 multiple choice or short answer questions covering chemical nomenclature, atomic structure, bonds and bonding, Lewis dot structure, chemical reactions, stoichiometry, inorganic and organic chemistry. The majority of students were females majoring in animal science, with similar numbers of Hispanic and white students. Thirty eight percent of the class earned a final grade of A or B and 24 % of students did not successfully complete the course, earning an F, W, or I. Findings indicate that students were poorly prepared in chemistry concepts tested. Students correctly answered 40 ± 5.6 % of pre-test and 47 ± 5.2 % of post-test questions. Organic chemistry and atomic structure test questions receiving a correct response increased ($P < 0.03$) from pre- to post-test on average, but correct responses to questions about bonds and bonding decreased ($P < 0.05$). Many students did not possess prior chemistry knowledge and related skills crucial to be successful in a course that utilizes chemistry components.

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Perception of the Post-Graduation Value of Study Abroad by Undergraduate Agricultural and Natural Resource Majors

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Students are encouraged to participate in study abroad experiences as part of their undergraduate program in the College of Agricultural Sciences and Natural Resources (CASNR) at the University of Nebraska-Lincoln. The benefits of Study Abroad Experiences (SAEs) are promoted as increased employability, promotability with-

in an organization, preparation for a global marketplace and a worthy investment of time. The purpose of this study was to determine if traveling internationally had an impact on the students' perception of employability, career benefit after graduation, travel recommendations to other students and if scholarships had any impact on the decision to participate in SAEs. CASNR graduates of the past ten years who participated in international SAEs as undergraduates were provided with online questionnaires with the ability to respond to open-ended questions. The results show students believe that SAEs are very valuable and sound investments; that future students should participate as often as possible in SAEs; and financial support is a considerable benefit for traveling abroad. It was recommended that a follow-up seminar be a requirement of any SAE to help students summarize and understand what they have learned, what skills and abilities they have developed, how to use this information in their educational program and to assist in their quest in seeking employment. It was further recommended that follow-up studies be conducted to research employer needs, encourage the creation of SAE scholarships, and make SAEs an integral part of a student's undergraduate program.

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Preservice Teachers' Perceptions of Mathematics in the School-Based Agricultural Education Curricula

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Mathematics knowledge is a critical component of natural and agricultural sciences, and school-based agricultural education is expected to support core academic instruction. Therefore, preservice agricultural education teachers must be prepared to teach mathematical concepts. This study explores preservice agricultural education teachers' perceptions of mathematics in the school-based agricultural education curricula. Five preservice teachers consisting of 4 females and 1 male participated in this qualitative study. This approach was used due to the ability to explore and interpret the phenomenon. Data were collected through individual semi-structured interviews that were approximately 30 minutes, and the constant comparative method was used to analyze the data. Audit trails, triangulation, member checking, and thick description were used to achieve trustworthiness. Five themes emerged from the analysis: (a) mathematical importance in agriculture, (b) relevance to life, (c) mathematics skills required to teach school-based agricultural education, (d) lack of mathematics proficiency,

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and (e) lack of awareness of mathematics in the curricula. The participants recognized the importance of mathematics within the field of agriculture and daily life. However, the participants were unaware of specific mathematical concepts found within the school-based agricultural education curricula. Furthermore, participants did not possess an understanding of the common core mathematics standards. Findings from this study indicated preservice teachers are not prepared to teach mathematics concepts and need additional mathematics preparation as well as exposure to current mathematics standards they are expected to teach. Future research should investigate the means of meeting these needs through the teacher education program and in-service training.

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Factors Influencing the Attitudes of Students towards Animals: Interactions of Culture, Demographics, and Education

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As populations become less agrarian, attitudes towards animals and their usage in society evolve. To investigate the attitudes of students toward animals, we surveyed students (n=93) prior to and following completion of an introductory animal science course. Questions were scored using a Likert scale 1-5, and divided into subcategories: pests/predators, pets, and production animals. Category composite scores (CS) and total composite scores (TCS) were expressed as percentages. Composite scores ranged from 34 to 100 with scores < 60 indicating a higher degree of animal empathy and scores > 60 indicative of more human-centered animal use values. Composite scores were examined for their correlation with; gender, age, income, major, residence (urban, rural non-farm, suburban, farm), animal ownership, and region of Ohio (NW, NE, Central, SE, SW). Gender (P < 0.001), major (P < 0.05), and residence (P < 0.05) significantly influenced pest CS while only residence (P < 0.05), and region (P < 0.05) influenced production CS. Interestingly, there were no differences in pet CS among demographic variables tested. There were no significant relationships between any CS and age, income, and animal ownership. Total (73.4 + 1.0 vs. 71.7 + 1.0), pest (74.6 + 1.2 vs. 72.4 + 1.2), and pet (75.7 + 1.0 vs. 73.3 + 1.0) CS were lower (P < 0.05), following completion of the introductory animal science course. Clear differences in student's perceptions of animals were noted between

subcategories and changed for pests and pets relative to course completion.

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An Exploration of the Effect of Instructional Training on Undergraduate Teaching Assistants in an Introductory Animal Science Course

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Within institutions of higher education, teaching assistants (TAs) are an invaluable resource. This is especially true in fields with a curriculum focused heavily in experiential education (i.e. Animal Sciences), due to the considerable manpower and organization required. TAs can offset these issues – and recently a common response to continued budgetary constraints is to employ undergraduate teaching assistants. However, while undergraduate TAs may seem like a good choice, often they lack instructional experience and demonstrate variable performance. So how can we develop this resource, while continuing to provide a beneficial classroom experience? This study explored the effectiveness of a collaborative (between Animal Science and Agricultural Education faculty) hybrid course that paired weekly formal teaching instruction with application (as TAs within an introductory Animal Science course). Specific research objectives included: (1) to evaluate if student instructional capacity was enhanced and (2) to discover the perceived benefits or detriments from course participation. Results indicated undergraduate TAs' instructional capacity was enhanced, with benefits falling into two categories: (1) general course benefits and (2) realized teaching skills. Course benefits included enhancing content knowledge, establishing valuable peer cohort and professor (role model) relationships and experiencing overall positive personal impact. Realized teaching skills involved learning the value of instructor reflection, improving teaching methods and developing a personal instructional identity. The only detriment was a noted lack of skill development when co-instructing with peers. Recommendations include implementation of similar programs within other fields, and continued research on undergraduate TAs, and the educational impact and utility of similar programs.

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Teaching CAD-Based Landscape Design Software to Traditional and Non-Traditional Students: What Works and What Doesn't

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Computer-aided design (CAD) is the standard technique for creating landscape design and irrigation plans. In addition to learning CAD software, non-traditional students are often challenged by computer technology in general. Consequently, teaching CAD-based landscape design to a traditional student is very different from teaching it to a non-traditional student. For example, the first question asked by one of my traditional students was, "Should constraints and inference be on or off when placing a raster image?" The first question asked by one of my non-traditional students was, "What kind of computer should I get?" Distinct teaching methods for the two groups include providing software manuals to non-traditional students while allowing traditional students to rely on one another or video tutorials. Specific methods of teaching that have worked for both groups include demonstrating a new concept or tool in CAD, assigning a small in-class exercise, and working with each student individually to make sure the concept is understood. Finally, assigning a take home project that implements the new concept into a larger project allows students to fully internalize the new concept. The non-traditional student needs additional time to learn new concepts, because using computers, in general, is not as intuitive as it is for traditional students. What facilitates learning for non-traditional students above all, is patience.

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Assessing Success of Student Placement into College Algebra

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The University of the Incarnate Word has recently decided to improve placement into its College Algebra courses by adjusting its criteria for deciding whether a student should be placed into a developmental math course prior to the College Algebra course; specifically, they have removed the Texas State test, TAKS, as a criteria because they believe this test to no longer be a significant predictor of student success in College Algebra. This change is intended to improve the future success of all

students who would take College Algebra, which is foundational course to all STEM fields. The students in the study can be segregated into two groups: those who were placed directly into College Algebra and those who went to College Algebra after completing the developmental math course. The students who went through the developmental math course were primarily placed using TAKS as the criteria; however, the students' TAKS scores are no longer available. The success of the two groups is compared in a number of ways: the proportion of students who passed, the number of students who completed College Algebra with an A- or higher, and other similar measures of success. A model is constructed to predict the success of students using simply SAT/ACT scores. SAT/ACT scores are dichotomized in the following way: 1 if the either score meets the minimum requirement and 0 otherwise. Finally, this model is used to compare how the students were placed compared to how the model suggests they could have been placed.

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Agricultural Teacher Efficacy Related to Teaching Dual Credit Veterinary Science Curriculum

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In response to Kentucky's call for high school students' College and Career Readiness, a need developed for dual credit agricultural courses offered through local high schools. To bridge the gap, college-level agricultural courses, such as veterinary science, were offered and Kentucky high school instructors started teaching advanced content. Questions arose regarding teacher efficacy and college-level curriculum delivery. The purpose of this study was to describe secondary agricultural teacher efficacy related to an introduction to veterinary science dual credit college course. The objectives of this descriptive study were to describe teachers' efficacy related to student engagement, classroom management, instructional strategies in a veterinary science course, and veterinary science knowledge. A modified Teachers' Sense of Efficacy Scale (long form) electronic questionnaire was used to determine teachers' efficacy levels from the target population of Kentucky agricultural teachers. A purposive sample of twenty agricultural educators was selected. Ten agricultural educators already teaching the Murray State University Academy of Agriculture animal science course and ten agricultural educators not participating in the program were selected. Results indicated agricultural teachers were generally confident in their teaching abilities and possessed knowledge of certain veterinary science content; however,

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er, were hesitant to describe themselves as experts in the delivery of advanced veterinary science curriculum. As this pilot veterinary science course is fully integrated into the program, replication of this study to track potential increase in efficacy from prolonged exposure to advanced curriculum is recommended. Practitioner recommendations included prescribed professional development related to skills and abilities required to teach the veterinary science content.

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Teaching Innovation Creatively in a Week

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Today, innovation is critical to firms' survival and therefore needs to be taught to students. At Purpan, a week long course was therefore developed. The objective of the presentation is therefore to discuss this successful curriculum, particularly the methods used to teach about innovation in a creative way. The process used to develop the curriculum and the steps taken to secure speakers will be presented. The presentation would conclude with our plans for next year's course based on students' feedbacks. The week started with an ice breaker followed by a creative session where students had to find innovative solutions to problems (e.g., how to improve society's image about agriculture?) Students also met with a young entrepreneur who explained his struggling path at creating an innovative product. This was contrasted by the presentation by a large company of its structured management of the innovation process. A regional association also came to explain how they assist companies in their innovation process. The organization that is in charge of delivering intellectual property rights presented the different types of rights and methods to protect innovation. A cooperative introduced students to their innovation process, its management and illustrated with specific concrete examples that were launched. This week long course concluded with a student group project where students could apply the principles learned. According to the survey, students enjoyed this course very much and found it useful for the future. They felt better prepared to address innovation in their future professional career armed with concrete tools.

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Recruiting and Retaining National Needs Fellows in the Area of Sciences for Agricultural Biosecurity

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Our objective was to recruit and retain three outstanding doctoral fellows from groups under-represented in the area of sciences for agricultural biosecurity. We prepared a one-page advertisement with details about the eligibility, benefits, background and other fellowship requirements. We advertised broadly using several innovative methods, including resources and programs developed by the Graduate Center for Diversity and Access (GCDA), and the CO-AMP (The Colorado Alliance for Minority Participation) alliance at Colorado State University, professional societies' websites and meetings, online list-serves, and project directors' professional contacts. We received over 30 email and phone enquiries from students throughout the US. We shortlisted these candidates based on their background, overall GPA, GRE scores, GIS experience, and other critical skills needed to pursue a PhD degree in Agricultural Biosecurity related to the science and management of harmful invasive species. We successfully recruited three outstanding fellows who satisfied program requisites. Two of our NNF fellows are from under-represented minority groups; a woman and an African-American male (originally from Ethiopia). All three fellows have successfully completed their course work with an average GPA >3.7, and have advanced to candidacy (passed qualifying examination). Fellows are actively engaged in multiple experiential learning activities nationally and internationally. All of them have already published at least one peer-reviewed paper, and are making excellent progress on their PhD research. Our program will contribute nationally to the National Needs Fellowship (NNF) program goals by increasing the number of highly trained scientists, particularly from under-represented groups, in the sciences for agricultural biosecurity.

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Service-Learning in a Developing Country: A Unique First Year Experience

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High impact practices such as study abroad, service-learning, and first year experiences (FYE) enhance student success. A multidisciplinary FYE seminar in the College of Agriculture and Life Sciences (CALS) was developed to help students become lifelong learners. Offered fall semester, the seminar provides opportunities to hone inquiry and problem-solving skills while integrating learning across disciplines. To extend that experience, and to encourage students to consider international options, a study abroad program centered on service-learning in a developing country, designed specifically for freshmen, was offered Winter 2014. Four faculty accompanied 13 CALS students (6 female freshmen from 3 majors; 7 upperclassmen, 3 male and 4 female, representing 5 majors) to Senegal, West Africa. Weekly meetings to familiarize students with Senegal-its geography, language, culture, agriculture and some of the challenges it faces-were held fall semester. Partnering with a USAID/ERA capacity-building project and VT's College of Engineering, CALS students collaborated with Senegalese students on prototypes for water filtration and silage making and group activities for youth (similar to 4-H). Initial qualitative assessment of a focus group at the start of spring semester, plus journal entries made during the trip, indicate that students have a greater appreciation of challenges faced by developing countries and for disciplines outside their own majors. The mix of freshmen and upperclassmen was a positive, as was the faculty to student ratio. Of the 7 upperclassmen, 5 plan to pursue international opportunities immediately, whereas freshmen are weighing their options. All 13 students agreed the program should be offered again.

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Articles into Tweets: Improving Students' Summarization Skills

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The use of Twitter in the classroom has been beneficial in developing students' writing ability. The need to write a thoughtful statement with only 140 characters forces student to be concise, exercise their vocabulary, and

become critical editors. Students in the Grain Crops class are provided articles to read throughout the semester and asked write a 140 character (*tweet*) summary of the article. The lead instructor then reads all of the submissions and selects the best one or two. At the start of the following class period the best tweets are written on the board prior to class and used as a teaching opportunity to discuss the important features of the article. Each tweet assignment is worth 5 points and students earn an additional bonus point (extra credit) if their *tweet* is selected as one of the best. Points are deducted for misspellings, generic text, going over the 140 character limit, and turning it in late. Although the students are not actually posting their *tweets* on Twitter, they are able to learn valuable skills in critically reading an article and summarizing the most pertinent information with only 140 characters. Students have articulated a positive reaction to this activity, but do express frustration with the limited character length. This teaching strategy has been utilized for two semesters in this course and the instructor has noticed a vast improvement in student's ability to apply the needed skills to write high-quality *tweets*. This teaching strategy will continue to be utilized in the future.

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Peer Knowledge Sharing Outside the STEM Classroom in Community Colleges

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Knowledge sharing is an important component of peer learning. Our study examined two important research questions: (1) what are the key factors that influence peer to peer knowledge sharing outside the classroom; (2) what are the methods the student use to share content knowledge. In order to explore these questions, a qualitative study was designed to explore knowledge sharing between peers outside the classroom. A semi-structured interview protocol with eight students from a Mid-Atlantic community college was conducted to explore students' perceptions of knowledge sharing between peers. Data were coded and analyzed by a group of researchers and themes were identified and theoretical and practical implications of the study were recorded. Several key facilitators of knowledge sharing were identified: self-efficacy, interpersonal relationships, interpersonal similarity and media richness. Implications for teachers are: Constructing frequent, structured, in-class situations to promote sharing, creating assignments that require continued discussion outside class, constructing assignments in a way to improve subject efficacy and content knowledge, teaching STEM courses integratively

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and not in disciplinary isolation. Student overwhelmingly preferred face to face communication when sharing classroom knowledge compared to electronic forms of communication.

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Negotiating the Rapids of High-Impact Experiences

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In response to the changing demands of the twenty-first century, institutions of higher education have adopted a variety of learning assessments and educational practices targeting specific learning outcomes. To meet learning goals, institutions of higher education are implementing high-impact educational practices (HIEs or HIPs). There are 10 common HIEs identified that increase student retention and student engagement in higher education. In the Agricultural Leadership, Education, & Communications department at Texas A&M University, seven high-impact practices have been implemented at the undergraduate level to engage approximately 1300 students in four degree programs. The purpose of this presentation is to highlight the seven principles of excellence in implementing HIEs which include 1) aiming high with established departmental goals for undergraduate student engagement, 2) providing students direction by integrating HIEs into individual degree plans, 3) teaching inquiry and innovation through service-learning and undergraduate research opportunities, 4) engaging the global questions and needs through study abroad programs and domestic field experiences, 5) connecting knowledge to decision making with action research and internships, 6) fostering civic and ethical learning through collaborative projects, teams, and cooperative exams; and 7) assessing students' ability to apply learning to complex problems through reflective writing exercises and portfolios. Participants in this session will apply the seven principles for brainstorming, implementing, and recruiting for high-impact experiences. Ideas will be shared from participant experiences and strategies that are applicable to classroom, departmental, college-wide, or university high-impact practices.

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Teaching and Learning in Sustainable Agriculture Curricula: A Case Study of Mediated Learning of Faculty at a Land Grant University

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Colleges of agriculture throughout the nation are enhancing curricula through the implementation of sustainable agriculture education (SAE) programs. SAE emphasizes a triad approach to teaching and learning, exemplifying curricula that are experiential, interdisciplinary, and fostering community engagement. This triad fulfills one of the land grant goals of outreach to society. The purpose of this study was to explore the mediated learning of faculty engaged in experiential-based SAE curricula at a land grant university. A qualitative research methodology was employed via a case study approach. The proposed methods of data collection included semi-structured interviews (n=8), participant/observer field notes (n=36), and secondary data analysis. Purposeful sampling was implemented for the selection of participants based on membership in the SAE minor's curriculum taskforce and a collaborative teaching team role in one of the four core courses in the minor. Observations were conducted spring 2013 in the introductory course, collaborative teaching team planning meetings, and curriculum taskforce meetings. Findings explore how faculty understand and participate in collaborative teaching, interdisciplinary teaching, service-learning as pedagogical practice, and the overarching sociocultural implications of SAE. Findings that will be shared include: Participation in collaborative teaching enhances the interdisciplinary knowledge, pedagogical practice, collaborative scholarship, and navigation of administrative structures. Faculty were found to recognize interdisciplinary and disciplinary knowledge perspectives and emphasized problem solving and answering complex questions in interdisciplinary teaching. Facilitation of student learning in SAE is viewed as experiential and creating applied knowledge. Additionally, faculty legitimized the role of the community-partner as educator.

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Engaged Scholarship Integration Strategies for an International Course to Costa Rica: A Case Study Using Environmental Triangulation

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This research examined the use of environmental triangulation to investigate student engagement and learning experiences in an international course to Costa Rica. The study examined two groups, one traveling in 2013 (16 students), and the other in 2014 (14 students). It explored experiential learning impacts on scholarly work and the establishment of permanent life-long learning connections. Participants in the 2014 international course were exposed to extreme environmental differences during experiential field study components. For example, they crossed a frozen lake in Pennsylvania on snowshoes, and days later trekked through a humid tropical rainforest in Costa Rica. The 2013 group were not exposed to these experiential extremes. The same environmental topics were assigned to both of the groups and included ecotourism, waste management, and natural resources. However, the 2014 group was given a domestic and international experiential field component for comparison. The level of student engagement was evaluated in the 2013 Costa Rica international course, and then compared with that of the 2014 Costa Rica course. The 2014 course included flipped classroom segments, social media components and engaged scholarship opportunities. Frequency of student online activity was monitored to determine student engagement both in the classroom and abroad. Student Rating of Teaching Effectiveness (SRTE) scores were used to gauge student satisfaction; and the quality of assigned multi-media projects were assessed to measure communication and technical skills gained. The findings show student engagement and online activity increased in the 2014 group as compared to the 2013 group; due to an added domestic experiential field study component.

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An Examination of High Impact Learning Opportunities Provided in Departments of Agricultural Education: Encouraging Learning in Varied Ways

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Faculty members' experiences with high impact learning (HIL) activities as a student and as a professional can directly impact one's administration of these activities. The purpose of this study was to document the use of high impact learning across departments of agricultural education. Eighty-five teaching faculty from agricultural education departments across the United States responded to a survey designed to gain a better understanding of how high impact experiences for undergraduate and graduate students are implemented. Seventy-five of the 85 respondents reported that, as students, they participated in study abroad experiences, research projects, internships, or on-site learning activities, such as student teaching. Respondents were asked about HIL (i.e., HIL learning in general, study abroad, internships, and research projects) from the perspective of comfortableness, knowledge level, and perception of ease of implementation. Although no respondents indicated that they lacked knowledge about HIL experiences in general, 22 of the respondents indicated not being knowledgeable or comfortable with implementing a study abroad. Notably, 73 of the respondents (90%) indicated that a study abroad is difficult or very difficult to implement. There were only 11 responses indicating that internships, research projects, and HIL activities in general are very difficult to implement. Findings revealed a critical need for support and training related to the implementation of study abroad activities. Documentation of actual HIL activities provides ideas for others seeking to encourage learning in varied ways.

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Reality Learning through Online Delivery in Principles of Agribusiness Management

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To teach critical thinking, business evaluation, and decision-making skills and to relate course content to actual business situations for students' future career/job appli-

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cation, utilizing multiple interactive discussion-based learning tools: 1. To introduce problem-based learning by observing workplace issues and determining applicable solutions; 2. To implement interdisciplinary/significant learning in the application of core course principles applied to 'real' business situations, coupled with an acknowledgement of the role of feeling, interests, and values in sound, ethical business decision-making; 3. To utilize technology-enhanced learning via multimedia learning computer-based instruction. The asynchronous online class engages in interactive discussion activities, progressing in complexity during the semester, where students demonstrate enhanced evaluation and managerial decision-making skills in actual business situations. Utilizing a discussion and interactive response process, students counsel "Angela" while defending agriculture's future. Next, they delve into Community Supported Agriculture, by selecting an agricultural product and citing research to determine: "Can some form of Community Supported Agriculture or "Farm to Family" marketing be successful in selling your chosen product?" Next, students watch a "Corporations" documentary prior to selecting, researching, and presenting an executive summary of findings for their own corporation (e.g., structure, stock, relation to agriculture, intended public image). Interwoven are five "Undercover Boss" episodes/discussions regarding demonstrated management principles, focusing on: "What would you (business manager) recommend the company do to improve the business for all employees?" The semester concludes with students returning as the Undercover Boss to their previously-selected corporations, identifying at least two management issues impacting the organization and describing how, as the CEO, they would obtain senior management buy-in and implement realistic change management programs.

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Opportunities in Grain Science – Tools Used in Freshman Orientation Class

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The Grain Science and Industry (GSI) program at Kansas State University is the only place in North America that offers Bachelor of Science degrees in Bakery Science, Feed Science and Milling Science. Each of these programs offers separate, unique opportunities in diverse career fields. A new Freshman Orientation Class (GRSC 100) was developed in fall 2012 to introduce departmental programs, activities, resources and careers. The course included a series of GSI programs specific lectures involving range of guest speakers including

several of our Junior and Senior students, and industry representatives. We identified and implemented range of surveys to gauge the (i) advising needs, (ii) preferred learning styles, (iii) studying skills, and (iv) perception of diversity. We also developed an "end of semester survey" which doubled as "retention survey" to measure the effectiveness of the orientation class in increasing freshman retention and also soliciting student feedback regarding their sense of community. This study focuses on the data collected in two consecutive years (fall 2012 and fall 2013). Advising needs survey indicated that 59-62% of the students strongly agreed on internal assets such as commitment to learning (72-75%), positive values (61-65%), social competencies (49-55%), positive identity (50-63%); and 60-64% of the students strongly agreed on external assets such as support/connectedness (73-76%), empowerment (64-67%), boundaries & expectations (50-56%), and constructive use of time (50-58%). The results were shared with the academic advisors so that they can help their advisees on areas that they need support. According to the study skills survey results about 1/3 of the students adopt deep approach (i.e. idealist-understand how it works and relate ideas), 2/5 adopt strategic approach (i.e. minimalist-achieve highest possible grades per learning time), while about 1/4 adopt surface apathetic approach (i.e. parrot-memorize and reproduce). At the end of the semester 80-85% reported that participating in GRSC 100 has given them the tools they need to plan for a career in GSI programs. About 80% indicated that compared to beginning of the semester they had a better understanding of the kind of work that GSI professionals do. Three-fourths of the students expressed that after participating in GRSC 100, they feel more sure than before about their currently selected major.

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Bugscope – 15 Years of Web-based Educational Outreach

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University of Illinois

Bugscope is an educational outreach and remote instrumentation project designed to introduce students to the worlds of entomology and microscopy. It provides educators and students with free, live access to a remote scanning electron microscope controllable through a simple, custom web interface. Developed at the Beckman Institute at the University of Illinois, the project will celebrate its 15th anniversary in 2014 and soon, its 850th live session. While the majority of participants are from the United States, schools from 18 countries have

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participated, from all continents except Antarctica. Participating educators discover that Bugscope sets few limitations on the curriculum or lesson objectives: classrooms are invited to submit their own specimens by mail, formulate their own research objectives, and freely conduct their explorations at their own pace within their allotted time. Scientists participating at Beckman prepare the specimens, provide training for the instructor, gently guide the exploration when problems arise, and answer student questions via a chat interface during each session. Participating educators are required to submit a project evaluation at the completion of each session. The teacher evaluations, chat transcripts, and student emails have provided us with a fifteen-year corpus of data on the impact of the project. We conclude that remote access to prohibitively expensive, research-grade equipment transforms student-educator interactions, and leads to a greater appreciation of the insect kingdom and its effect on humans, agriculture, and ecosystems. We present an overview of the project's effectiveness, and examples of how the project is used in K-16 classroom settings.

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Stepping Outside Comfort Zones: Utilizing Service Learning Projects to Promote Student and Community Engagement

Joy Morgan and Elizabeth Wilson
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Service learning engages students in an experiential setting while promoting student learning, student development, and community engagement. Within the "Teaching Diverse Learners" course, students are exposed to the history and education of diverse populations while emphasizing the planning and facilitating of teaching strategies to assist those with special needs become successful in the agricultural classroom. A service learning project was created to allow students to work with a local program designed for teens and adults with development disabilities. Prior to starting the project, students completed a pre-questionnaire to evaluate their experiences, comfort level, and perceptions about working with special needs students. A small percentage (16%) had extensive experience working with special needs students. At the end of the project, students submitted reflection papers and completed a post-questionnaire. Findings indicated students' comfort levels and overall awareness increased. Students also indicated that by working in a "non-classroom-like" atmosphere, they were able to see the value of agriculture classes to this population and the importance of providing modifications. The students enjoyed working with the

teens and adults at the center to complete tasks such as: painting, planting, repairing raised beds, and attending agriculture field trips. One student stated "I have been able to enhance my understanding that different students demand different methods of teaching from me in order to learn." Every single student made some reference to a similar concept being learned because of the service learning project.

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An innovATE-ive Approach to Building Capacity through AET: SWOT Study in Armenia

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The mission of the Innovation for Agricultural Training and Education (innovATE) Project is to cultivate the human and institutional capacity necessary for developing countries to promote rural innovation needed to achieve sustainable food security, reduce poverty, conserve natural resources and address other rural problems. Our objective is to define and disseminate good practice strategies, approaches, and investments for establishing efficient, effective and financially sustainable agricultural education and training (AET) institutions and systems. The innovATE program implemented a scoping study in Armenia in Spring 2013 with a faculty consortium of US universities led by Virginia Tech. This study addresses the strengths, weakness, opportunities and threats to AET across the Armenian education system. Primary data collection consisted of interviews with various AET stakeholders in Armenia. Participants included members of the private sector, government offices, agricultural research institutions, agricultural support NGOs, international agencies and students and faculty from educational institutions at various levels of AET. Observations and results will be presented on addressing core challenges at higher education institutions, creating curriculum at secondary and vocational levels, and developing the food processing and agri-tourism industries. Armenia faces limited export markets, meeting the food processing standards of Western export markets, growing local demand for Armenian products, and producing a workforce that has the capabilities to address these complexities. AET can play a large role in helping overcome these challenges.

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Utilizing Universal Design as the Instructional Context for Student-Faculty Collaboration

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Student-faculty interface within institutions of higher education can be a significant, dynamic experience. While formal classroom encounters play a central role to a student's educational experience, learning that occurs outside the classroom can often be just as effective, if not more so. Research tells us that there are specific educational practices that foster student engagement; conditions such as academic challenge, active and collaborative learning, student-faculty interaction, and providing enriching educational experiences. In addition, connecting students at different educational levels (i.e. undergraduate and graduate) together with faculty offers the potential for a diverse, synergistic learning environment. This innovative teaching approach involved engaging undergraduate and graduate students with faculty in a project that tackled culture and social justices issues, addressed through universal design. By definition, universal design is a process where communities strive to create equal accessibility and opportunity for all. Cultural representation is enhanced through this process; often the first step in creating a completely inclusive community. During this experience, students collaborated to develop a photo-documentation process that engaged local government employees in questioning the inclusive or exclusive nature of their work environment. Students designed the project, as well as carried out the research and evaluation process. Thus, students served to create, implement and evaluate the intervention, as well as their own education experience. Faculty provided connection points for students, as well as appropriate educational scaffolding and feedback. Overall, the collaboration experienced between student-student as well as student-faculty encouraged stress, innovation, and relationship-building, resulting in a powerful educational experience.

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Creating a Culture of Professionalism in an Undergraduate Horticulture Program

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Professionalism has been defined as: "the conduct, aims, or qualities that characterize or mark a profession or a professional person." Along with transmission of horticultural knowledge and skills, the development of attitudes and behaviors characteristic of professionals should be a primary objective of undergraduate horticulture programs. In an effort to increase professionalism among horticulture undergraduates at Kansas State University, a list of ten statements describing professional behavior was developed for inclusion in all course syllabi, and was incorporated into a poster for prominent display in classrooms. The statements were as follows: "Professionals... 1. show up; 2. arrive early and stay late; 3. are alert, attentive, and engaged; 4. act with integrity; 5. respond and communicate appropriately; 6. dress appropriately for the occasion; 7. take pride in their work; 8. bring the best out of others; 9. are enthusiastic; and 10. take responsibility." All departmental undergraduate instructors have also agreed to emphasize these attitudes and behaviors in classroom dialogue. Assessment of this emphasis on professionalism will be accomplished through evaluation of pre-/post-survey responses from departmental undergraduates.

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Evaluation of Interest in an Online Degree in General Agriculture

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Universities recognize that transfer students are an important part of the student body. To estimate the level of interest in a four year Agriculture degree and preference of class material delivery method (online, blended, or face-to-face), 120 Community College students were surveyed. It was found that 67% of the students were interested in a four year degree. In terms of delivery, students were nearly equal in their preference of delivery (online = 27%, blended = 32% and face-to-face = 32%). Interestingly, 84% of students favored a curriculum with a high degree of flexibility vs. traditional structured (12%) program areas of study. This study demonstrates that student preference for delivery method of course material is very similar among the three platforms. However, students strongly favor a four year degree with a high degree of flexibility in the curriculum.

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A Geographic Information System and Remote Sensing Geoheritage Investigation of the Upper Pecos River Valley

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We report on a multidisciplinary study that is using Geographic Information System (GIS) and Remote Sensing techniques to evaluate changes in land use practices in the Upper Pecos River Valley, northern New Mexico and U.S.A. Our study is assessing how changes in land management practices, political events, and agricultural expansion influence the cultural development of a rural Hispanic American community. A comparative investigation from a series of satellite imagery is examining changes in the conditions of the study site and in the land use over time. Landsat satellite images from the 1970s to the present are providing multispectral measurements of vegetation coverage and vegetation health in both growing and non-growing seasons. Environmental changes are being evaluated using records of climate, precipitation, stream discharge as well as oral and written histories. A better understanding of land use practices in the Upper Pecos River Valley will aid in conservation efforts and the management of the physical and cultural landscape. Study results will also be used to demonstrate to the local community the value of modern science investigations in aiding the decision making process. In addition, the results from this study will be integrated into the Ribera Community Cultural Center and Pecos Historic Park.

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Today's Animal Science Students: A Look at Students' Backgrounds, Interests, and Perceptions

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Effective teaching requires that the instructor know the intellectual needs of students. In order to enhance student learning, a survey was given to all incoming animal science freshmen at Kansas State University (n=225) to gain a better understanding of their backgrounds, interests, and perceptions related to agricultural production. The majority of respondents (65.8%) did not consider

themselves from a traditional agricultural background. Dogs and cats were ranked as the primary species of interest, followed by horses. However, students ranked horses and cattle as the species with which they desired more hands-on experience. Almost half (43.5%) of respondents identified animal behavior, management, and well-being as their primary discipline of interest. Overwhelmingly, 94.6% of students indicated a desire to get experience through an internship and they were willing to move or travel abroad for this opportunity. Students' backgrounds did affect responses to questions related to current production practices involving the use of antibiotics, growth promoting products, and genetically modified organisms. Students that grew up on farms or ranches where their families' primary incomes were from agriculture viewed most production practices as safe and favorable. Students not from farms or ranches and whose families' incomes were not from production agriculture believed more regulations are needed that require veterinarians to perform practices such as castration and de-horning, and that analgesic agents should be used. These data can be used to reevaluate institutional curricula to meet the changing needs of students and highlight the need for more hands-on and internship opportunities.

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Fostering University-Community College Collaboration for a Horticulture Online Degree Completion Program

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As online baccalaureate programs become more common in higher education, agricultural sciences courses with laboratories provide challenges for effective online delivery. Therefore, the relatively widespread distribution of community colleges that teach these laboratory courses becomes increasingly important as partners in the successful creation of an online degree completion effort at a four year college or university. Specifically in Colorado, an alliance has formed between Colorado State University and Front Range Community College to more effectively serve place-bound students, which want to complete a baccalaureate degree in horticulture with a concentration of horticultural business management in the metropolitan area of Denver. As a consequence of

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this alliance, a statewide articulation agreement has been approved, allowing a more seamless transition for students that transfer between institutions. Of the five baccalaureate online degree completion programs (final two years of a baccalaureate degree) already in place at Colorado State University, average enrollment among programs is 131 with students enrolling in an average of 7.4 credit hours per semester. A sixth degree completion program was launched in fall of 2013 and the horticulture major is scheduled for fall of 2015. Statewide articulation agreements are in place for all six of the existing online degree completion programs.

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The Chicago South Side Urban Agriculture Initiative: Evaluation of a New Agriculture Curriculum and Innovation Network at an Urban Predominantly Black University

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The Chicago South Side Urban Agriculture Initiative seeks to make Chicago State University (CSU), a predominately African-American university on Chicago's South Side, into a hub of Urban Agriculture education and innovation. In 2011, Chicago State received a NIFA Higher Education Challenge Grant to support the development of the initiative, building on its successful aquaponics center. A preliminary evaluation of the initiative will be presented, focusing on successes and challenges in the development of an Urban Agriculture curriculum at CSU and in CSU as a node of community learning and innovation. Evaluation included a preliminary assessment of project partner goals and objectives and structured interviews with project partners about results, in addition to objective measures such as meeting attendance and class enrollment. To date, CSU has built a successful Urban Agriculture community network that has linked the community with multiple resources and fostered numerous collaborations. Curricular success has been mixed. Paired Urban Agriculture curricula were created within the Biology and Geography programs, which balance preparing graduates for professional careers and general training in the life and social sciences. Individual classes within the curricula have been successful and there has been great student interest in the aquaponics center, but no majors have enrolled in the Urban Agriculture programs. This presentation will discuss the evolution and philosophy of the new curricula,

possible reasons for the issues with enrollment, CSU as a hub of Urban Agriculture community-based learning, and how CSU these programs may inform those at more traditional agricultural education institutions.

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Engaging Underrepresented Agriculture Students through Research and Job Training in the STEP UP to USDA Career Success Program

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Texas A&M University-Kingsville (TAMUK) developed a program to engage students in scientific research or career experience and better qualify for USDA employment upon graduation. This program is one of seven USDA/NIFA Collaborative Projects and it bridges Associate (AD) and Baccalaureate degree granting (BD), Hispanic Serving Institutions. Undergraduates (n =124) received scientific research experience or career training at various USDA or State Agricultural Agencies. In year one (YR-1), 31 AD- and 36 BD-students participated. The majority of AD students (74.2%, 23/31) participated in research and 22% received USDA career training. After YR-1, 63.6% of AD-students graduated and enrolled in a BD institution with 78% attending TAMUK. Of the 36 BD-students, 66% were engaged in research, 39% were USDA trained, and most were retained (56%, 20/36) in the program or graduated successfully (36%, 13/36). Agency employment (38.5%, 5/13) and acceptance into graduate school (38.5%, 5/13) was similar in YR-1, BD-students. In year two (YR-2), 17 AD- and 38 BD-students participated and USDA opportunities increased (9/17 AD and 23/38 BD). Program retention in YR-2 was similar to YR-1 (37% vs. 37.3%). Meta-evaluation indicated a 95% student satisfaction within the seven USDA/NIFA Projects, 99% student satisfaction with USDA experience, and 91% of students would accept a USDA job if offered. A majority (53%) of students would relocate for USDA jobs but limiting factors included financial (38%), distance (20%), and familial (11%). We have shown STEP UP to USDA Careers has successfully trained and retained underrepresented students to increase workforce diversity and encourage successful graduation.

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Building Understanding of Quantitative Approaches for Undergraduates in Natural Resources

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Experience indicates undergraduates in Natural Resources programs often find learning quantitative methods to be intimidating. For an advanced undergraduate course in Wildlife Population Ecology, I have developed a sequence of reinforcing activities to teach Population Viability Analysis (PVA), which includes mathematical tools such as stochastic, stage-structured, matrix models. The multi-pronged approach acknowledges the diverse learning styles of students while using a problem-solving framework to demonstrate the relevance of PVA. First, students are introduced to matrix models and PVA during lecture and immediately learn the basic mathematical operations involved in matrix projections. Next, students learn to employ user-friendly software to conduct PVAs with an emphasis on applications to contemporary conservation issues. Then, we have multiple, small-group discussions of journal articles that include use of matrix models and PVA. Finally, I provide students with a data set from a published article and they conduct an independent PVA and write their own paper in the format of a short journal article. The paper focuses on conservation of a small population of black bears in a national park. This integrated teaching approach emphasizing real-world applications has been effective in removing the “fear of math” hurdle for Natural Resources students.

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Educating Leaders for Tomorrow’s Sustainable Plant Production Systems

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University of Nebraska – Lincoln

Production agriculture in the United States faces numerous challenges that both directly and indirectly impact the sustainability of the nation’s crop production systems. Addressing these challenges requires an increased input of knowledge and expertise to develop integrative plant management systems that maximize economic, environmental and social sustainability. Crop consultants/advisors, including private, public (e.g. extension), and industry affiliated, will play a major role in providing this expertise; however, their numbers are lim-

ited and impending retirements create a critical need for training high level professionals. To address this need the University of Nebraska-Lincoln has created the Doctor of Plant Health (DPH) Program. The DPH program educates doctoral-level practitioners with broad interdisciplinary training who will be able to integrate from across this system-wide knowledge base to diagnose and solve plant health problems and to develop more sustainable plant management systems. At the onset of the program we were successful in receiving a National Needs Fellowship (NNF) grant to support three students in the DPH program. This NNF grant assisted us in recruiting some of our first students into this innovative program. The jumpstart provided by the NNF program has been critical to the startup and development of this important program and enabled us to grow to 15 students in 2013. Based on the interest from many segments of the plant production industry for securing our students for internships, and also, in hiring our recent graduates, this program is filling an important need that will benefit the future of agriculture.

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A New Curriculum for Ethics in Agricultural Communications

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Texas Tech University

Many universities require ethics in every course. However, communications textbooks address ethics from a mainstream journalism perspective and not specific to agricultural communications. The need for customizable ethics curriculum for agricultural communications students is addressed by the Ethics in Agricultural Communications Online Curriculum Project. The American Agricultural Editors’ Association (AAEA) Foundation created the curriculum with Texas Tech University for faculty and professionals. The curriculum consists of seven chapters, including photography, journalism, public relations, and law. Each chapter has printable lecture slides, a learning activity, case studies relevant to the subject, and a video that enhances the chapter. The curriculum is designed for all the elements in each chapter to be used together; however, most faculty indicated they would use the curriculum to enhance lessons they had developed already. The curriculum contains lesson objectives, Power Point slides, reading materials, video presentations, and assessments. Consumers of the curriculum need a computer connected to the Internet and a pair of speakers to access the material and utilize it to its full potential. This material offered by AAEA is free for use

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by educators, students, and professionals. It can be found at

<http://www.dwdgo.net/domains/AssociatedAdv/ageditors.com/AAEA-Ethics-Curriculum/ethicsweb/>.

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Teaching Behaviors Demonstrated by College Instructors

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The quality of teaching in colleges and universities is sometimes a concern. Based upon that concern, universities are showing increased attention to the quality of the pedagogy practiced in classrooms. Based on Darling-Hammond's seven Teaching Behaviors for Powerful Learning the researchers sought to determine what teaching behaviors students perceived as most important and if those behaviors are being demonstrated in college classrooms. This descriptive research was conducted in a mid-level agricultural communications course. The subjects were asked on a five-point Likert-type scale to rate the behaviors on the level of importance the teaching behavior has on their learning and the frequency that they encountered the teaching behaviors. The instrument items were then summated to calculate construct values. Students confirmed that all the teaching behaviors purported by Darling-Hammond are important to their learning process. The behavior of *Provides clear standards and constant feedback* was found to have the highest level of importance to the students. *Scaffolding the learning process* was determined to be the most frequently demonstrated effective teaching behavior by college instructors as perceived by the respondents. However, students responded that *Encouraging strategic and metacognitive thinking* is important but they do not perceive it being demonstrated to the extent of the other behaviors. This may constitute that college instructors need to be more explicit to students when incorporating strategic and metacognitive thinking to aid in learning effectiveness. Furthermore, college instructors should continue to demonstrate the effective teaching behaviors.

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"Trade Show Display" Learning Activity to Enhance Plant Identification Courses

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Plant identification courses are significant curricula in a horticulture program. These courses tend to disseminate large amounts of information and can be challenging for many students. Rote learning often becomes a common learning technique used by students and can result in reduced comprehensive understanding of the plant materials. In the Landscape Plants courses at Kansas State University, a major goal for the courses has been to implement unique experiential learning activities to encourage student engagement and diversify typical plant identification courses. In previous semesters of the Landscape Plants II course, students were required to pick a plant genus of interest at the beginning of the semester. They prepared a 4 to 6 page paper describing the genus (reasoning for choice, cultural conditions, important species, etc.), along with a 15-minute oral presentation for the class. In the Spring 2014 semester, the presentation portion was modified with intent to provide a more meaningful and satisfying learning experience. Trade shows are important aspects to the horticulture industry. Thus, the typical PowerPoint™ presentation class component was substituted for a 'trade show display' presentation format. In this format, students were required to 'sell' their plant genus by constructing an eye catching, informative display. Groups of students presented on different days and students that were not presenting or 'selling' were the 'customers' and perused the 'trade show' to learn about the various genera. Pre- and post-trade show survey instruments were administered to evaluate the activity.

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A Qualitative Inquiry into Undergraduates' Reasoning When Deciding Whether or Not to Attend Class

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Absenteeism is a growing problem in higher education and has negative effects on students' success, faculty morale, and overall learning environment. However, few

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inquiries have investigated students' reasons for missing class. Therefore, this inquiry examined students' reasoning when deciding whether or not to attend class. A social constructivist theoretical perspective guided this study, and three focus groups were used (n = 24). Data were analyzed using the constant-comparative method, and the emergent themes were complementary with Dunkin and Biddle's model for classroom teaching, which includes teacher, student, context, and process variables. Themes related to teacher attributes included: instructor is boring; teacher-student rapport; strictness; task orientation; and enthusiasm. Student-related themes were: value placed on course; background knowledge; stress; family and work; prioritizing other classwork, service, or extracurricular activities; physiological readiness, interest; current grade; and value placed on general education versus major-specific courses. Context themes included: class structure/organization; class size; time of day; lab versus classroom instruction; required attendance; hands-on course; course difficulty; availability of content/materials online; weather; time between classes; and length of class session. Themes related to process variables were: learning activities utilized; what is scheduled for a class session (e.g. guest speaker, exam review); instructor reads notes or PowerPoints; and amount of busy-work. Thus, the following instructor and institutional recommendations may improve class attendance: ensure variety of research-based instructional strategies, cultivate teacher-student rapport, promote general education relevance, strengthen avenues for dealing with physiological readiness deficiencies, examine institution and extracurricular activities to minimize instructional conflict, and mitigate class structure issues.

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Research-Based, Interdisciplinary Multicultural Scholars Program at Oregon State University Has a High Graduation Rate of Minority and First-Generation Students in a STEM Major

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Goals of our USDA-NIFA Multicultural Scholars Program (MSP) are to recruit, retain, mentor and graduate Multicultural Scholars to meet national needs for STEM scientists and professionals in Agricultural/Natural Resource/Food Sciences. To accomplish this, we provided Scholars with critical factors for retaining minority students in sciences: (1) an outstanding research experi-

ence, (2) effective academic and personal mentoring, (3) professional development opportunities, and (4) significant financial support. Scholars majored in BioResource Research, an interdisciplinary major with a required 2-year mentored research project of the student's choice, thesis and public seminar. The benefits of undergraduate research to retention and academic/professional development are well documented. We offered smaller scholarships to upper-division students to act as peer mentors to Scholars. Participation in USDA MANRRS (Minorities in Agricultural, Natural Resources, and Related Sciences) provided professional development and additional peer mentoring. MSP scholars were evaluated twice a year in three areas: personal well-being, professional well-being, and programmatic evaluation and support. Although numbers are low (6 students/year in 2009, 2011, and 2013), qualitative assessment supported the quality and importance of the MSP program. Quantitative assessments identified key areas for student growth and success. The 2009 cohort all participated in research or internships and service learning, six presented at national meetings, three participated in an international experience, and six have graduated. Since the rest are on track to graduate this year, our first cohort of MSP scholars will have a 6-year graduation rate of 87.5% from OSU, or 100% total, compared to the university 6-year graduation rate of 60.4%.

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The Great Debate: An Exploration of Using Debate in the Leadership Classroom Introduction and Background

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Leadership can be taught through various avenues. The traditional delivery of leadership education consists of a series of lectures delivered in the classroom. However, within the past ten years leadership educators have striven to actively engage leadership students in the learning process by incorporating simulations, popular movies, television series, and even poetry in the leadership curriculum. An introductory leadership course at University of Arkansas collaborated with communication faculty to create a series of debates to facilitate student engagement, individualized learning, understanding of leadership theory, and reinforce communication skills. The debate activity utilizes Kolb's Experiential Learning theory to actively engage students in the learning process. The Experiential Learning theory emphasizes learning as a process in which knowledge is created through experience. Debate topics included trait theory, ethics, transformational leadership, servant leadership,

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and conflict resolution. Students participated in the each debate as team members and as audience participants. Additionally, at the conclusion of each debate, students composed a reflection stating their opinion on the issue. At the completion of the series of debates, students demonstrated a stronger understanding of leadership theories, philosophies, models and concepts when compared to test scores from previous semesters. Additionally, students were more engaged in class discussion and were able to retain the information throughout the course of the semester as demonstrated in a variety of activities and assessments.

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Comparing Senior Agriculture and Non-Agriculture Students' Use of Time

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There are 168 hours in one week. Assuming students spend 16 hours in formal academics (lectures, labs, etc.) and sleep eight hours per night, approximately 96 unaccounted for hours remain. What do students do during these hours? The purpose of this study was to describe time use (in seven specific areas) for senior agriculture (N = 115) and non-agriculture (N = 909) students and determine if the two groups differed significantly ($p < 0.05$). Data for this study were obtained from responses to selected items on the 2013 *National Survey of Student Engagement* (NSSE) administered at the University of Arkansas. Senior agriculture students spent significantly fewer mean hours per week studying or preparing for class compared to non-agriculture seniors (11.66 and 13.63, respectively). This finding is a concern and should be further explored. There were no significant differences between agriculture and non-agriculture seniors in the mean hours per week devoted to paid work (15.50 and 13.96, respectively), relaxing (12.03 and 11.88, respectively), caring for dependents (4.91 and 4.65, respectively), commuting (4.61 and 4.56, respectively), co-curricular activities (3.92 and 4.82, respectively), or community service (2.38 and 2.81, respectively). Assuming that studying, co-curricular activities, and working are classified as 'productive' uses of time, agriculture and non-agriculture seniors do not differ in mean productive hours per week (31.08 and 32.41, respectively). Despite the often negative portrayal of college students, if one assumes an additional 16 hours of in-class time, senior agriculture and non-agriculture students both exceed the traditional 40-hour work week.

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Who Am I? Using SWOT Analysis to Teach Self-Assessment and Strength Recognition

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"According to an article by Northouse, "The challenge we face as leaders is to identify our own strengths as well as the strengths of others and then use these to make our organizations and followers more efficient, productive, and satisfied." Team projects are frequent in leadership education. This activity was used in an upper division leadership course at a southern, land-grant institution. The intent of the SWOT analysis activity is three fold. First, students became self-aware of their personality traits and characteristics through a variety of personal assessments including the StrengthsQuest assessment, True Colors assessment, Keirseley Temperament Sorter II, iPersonic test, task and relationship orientation assessment, and introvert and extravert assessment. Secondly, students completed a personal SWOT analysis to identify personal strengths, weaknesses, threats (what type of people they should not work with), and opportunities (what type of people they should seek to work with). Lastly, students formulated teams consisting of individuals who complemented one another through their individual strengths. Within their groups, students were required to spend 20 hours working with a local organization to complete a community service project. The results of this activity yielded seven functional teams who completed a service learning project as a group over the course of a semester. Students reported the team project to be an enjoyable experience with team members working seamlessly together. Students informally reported using the SWOT analysis tactics to formulate teams in other courses as well as using the personality assessment results to promote themselves in interviews with potential employers.

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A Conceptual Model to Guide Faculty Members in Directing Undergraduate Research

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Colleges of agriculture have traditionally focused on transmission of content knowledge to students in the various agricultural disciplines. However, recommendations have called for instruction in colleges of agriculture to reach students on a higher cognitive level leading to increased critical thinking and problem solving skills. One possible solution is implementing undergraduate research opportunities for students. Literature has described the benefits of undergraduate research; however, a shortage of practical recommendations to help faculty direct research projects exists. Therefore, the purpose of this philosophical study was to create a conceptual model to guide faculty members in directing undergraduate researchers. Directing undergraduate research involves teaching, supervising, and mentoring. Teaching in the context of undergraduate research includes the teaching of theories, disciplinary content, methods, statistics, and research principles, both in and outside of the classroom. Supervising undergraduate research consists of overseeing research activities, organization, providing the proper tools for students, and guiding the research process. Mentoring comprises developing relationships with students to help increase their intellectual and emotional development, which includes acculturating students into the discipline, helping students see the value of research, assisting students with networking within the discipline, and helping students mature as professionals. The practical recommendations included in this conceptual model can serve to help faculty members in executing undergraduate research by providing guidance for the process. In addition to undergraduate research, the concepts of teaching, supervising, and mentoring provided in this model may prove helpful in other areas of student interaction such as advising and service learning.

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It's All about P.M.A.: The Teaching & Learning Power of a Positive Mental Attitude

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As an agricultural leadership professor, there are three components that make up the teaching and learning outcomes in college courses...the teacher, the student, and the content. The attitude that the teacher brings to the course can have a positive or negative effect on student attendance, learning, achievement and engagement. The effects of a Positive Mental Attitude (P.M.A.) are grounded in positive psychology. Teachers that teach with a PMA have higher student attendance, more engaged students and higher course evaluations. Participants will learn how to utilize real-life assignments for a real world purpose, and create assignments like "Have a Tigger Day" and "Pay It Forward." In a PMA course, the course syllabus often takes bends in the road to apply content to the students' lives, where each of their lives becomes the content of the course. Problems and issues in agriculture are viewed through a lens of possibilities and "what ifs." Teachers and students collaborate and communicate with mutual respect, trust and social etiquette, following agreed-up rules of discussion, while using critical thinking and analysis skills to see and view the world empathically. Students are able to dream, feel safe, take risks, make leap lists, understand what they value, and make a positive difference in the lives of those around them. Students that make the choice to see life through a lens of joy and positivity begin to see positive patterns and success stories in their own life and the lives of others.

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Correlation of Naturalist (Science) Multiple Intelligence with Learning Styles of College Students in Animal Sciences

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There is a multitude of research concerning Multiple Intelligences (MI) and Learning Styles (LS), but very few studies involving higher education. It is pertinent for college instructors to understand and be aware of both Learning Styles and Multiple Intelligences of their students. Our intent was to find a correlation between the Naturalist Multiple Intelligence levels, specifically the science subcategory, and the Learning Styles of University of Illinois students enrolled in animal science courses. Students completed two online assessments: Index of Learning Styles (ILS)-North Carolina State University and Multiple Intelligences Developmental Assessment Scales (MIDAS). As expected due to their chosen degree pathway, all participating students (n=490) possessed high percentages (60-100) in the Naturalistic Multiple Intelligence, but they were not consistently high

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in the science subcategory. Both high (60-100%) and low (0-40%) scoring students tended to have Active, Sensing, Visual, and Sequential learning style preferences, though the high scoring students were more prone to be Reflective and Verbal learners than those with low percentages. The low scoring students were more Sequential and Sensing learners than the high scoring students. Though there may not be a direct correlation, there are differences among the high and low scoring students in the science subcategory and their Learning Styles. These results are relevant for the design and implementation of college courses to enhance genuine learning by making closer connections between the teaching methodology and pedagogy and students' LS and MI. It could also be vital in guiding college students with course selection and degree choices.

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Camp Pawnee Service-Learning Project

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Service-learning is a method of teaching and learning that integrates community service activities into academic curricula and expands the learning of students from the classroom to the community. The goal is to benefit both the community and the student. Service-learning gives hands-on experience to students and encourages students toward lifelong civic involvement. Camp Pawnee, a service learning project, was incorporated into the Home Horticulture course in 2012 and 2013. Larned Pride was created in 2009 by local citizens with a mission of creating a better environment and enhancing health for those in Pawnee County and the surrounding area. A major undertaking of Larned Pride was the renovation of Camp Pawnee (Larned, KS), a previous Boy Scout camp, donated to the county. Students assisted with tree and flower planting, drip irrigation installation, mulching, and installation of new playground equipment as well as painting of donated playground equipment. Students completed a survey with the following conclusions: 1) 86% believe that participating in the service-learning project helped them to better understand course content, 2) 89% believe they learned more participating in the service-learning project than writing a term paper on landscaping; 3) 82% believe that participating in the community helped them enhance their leadership skills, 4) 89% believe the community benefitted from their participation in the service-learning project, and 5) 82% believe that service-learning should be implemented into more classes at the university. Overall, students increased understanding of the course material and its use in everyday life while contributing to the community.

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State-level FFA Career Development Events are an Opportunity to Recruit High School Students into Agriculture Majors

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Recruiting students into agricultural majors around the United States has been a major concern in recent years. FFA Career Development Events (CDEs) are held annually, often at a state's land-grant university. Faculty with teaching and extension appointments in the various agricultural disciplines often organize and conduct these events for the hundreds of high school students that travel to compete in them. At Kansas State University, in each of the past 14 years (1999 to 2012), over 100 students have participated annually in the state-level nursery and floriculture CDEs. With these rosters, totaling 1,462 participants, we investigated whether each FFA CDE participant was accepted to K-State; enrolled at K-State; the degree program enrolled in; and whether the student graduated, among other factors. We found that just over half (51.7%) of these former FFA horticulture CDE participants were accepted to K-State, with 32.1% matriculating at the university. Of those who matriculated, 57.8% enrolled in the College of Agriculture. Of those, 18.5% majored in horticulture, 16% in animal science, 11% in agricultural education, 10% in agricultural communications and journalism, 9% in agronomy, 8% in agricultural business, and 4%, 2%, 2%, and 1% in food, feed, milling and bakery sciences, respectively. Intuitively, the number of students selecting horticulture as their major would be higher from this data set because students had self-selected to participate in the horticulture CDEs during high school. These results suggest that FFA CDEs have the potential to serve as a valuable recruitment tool.

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Comparison of Two Online Learning Platforms: Promoting Offer of Online Courses in the College of Agricultural Sciences

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Based on students and faculty feedback, it was determined that there was a lack of utilization of online learning platforms in the College of Agricultural Sciences,

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University of Puerto Rico at Mayaguez. Therefore, a pilot program was developed to examine two different online learning platforms. To encourage faculty involvement, a laptop computer was offered to each participant. Twelve faculty members from the College of Agricultural Sciences were trained in the utilization of Moodle and Udemy. Three workshops per platform were offered to prepare faculty for using any of them in their courses. A final survey was given to compare the participants' satisfaction with the platforms. On a scale of 1 (completely disagree) to 5 (completely agree), with an average score of 4.7 and 4.6, participants found that the topics were new and innovative for Moodle and Udemy, respectively. The average score for dynamic and entertaining workshop was 4.8 and 4.1 for Moodle and Udemy, respectively. Furthermore, when asked about the ability to incorporate either platform in their courses, the score was 4.9 and 4.0 for Moodle and Udemy, respectively. All participants, during the last workshop were able to present their courses in the Moodle platform but only one was able to do it in Udemy. It was concluded that the Moodle platform seems to be user-friendlier than Udemy for our faculty. Currently, those participants are utilizing the Moodle platform, impacting 330 students per year. Presently, twelve additional faculty members are being trained in Moodle to impact approximately another 350 students.

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Grade Discrepancies and Self-Regulated Learning in a Soils Course

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Instructors understand the importance students place on grades, and historically grades are exam based. However, studies have proposed that students may have an inflated sense of their exam performance. Researchers have termed this *unrealistic optimism* and suggested this may indicate a lack of self-regulated learning. Therefore, examining discrepancies between students' expected exam grades and actual grades can help ascertain self-regulated learning. Thus, the purpose of this descriptive study was to examine students' self-regulated learning behaviors in relation to their grade discrepancies. This study utilized a census of students enrolled in a soils class during summer 2013 ($N = 8$). Grade discrepancies were determined by averaging the difference between students' actual grades and their expected grades on three exams. A negative average discrepancy indicates a higher expected score and a positive average a lower

expected score. Self-regulated learning was measured using the elaboration, rehearsal, organization, and metacognitive self-regulation constructs from the *Motivated Strategies for Learning Questionnaire*. Seven students had negative average discrepancies ranging from $-.33$ to -19.83 , while one student had a positive average discrepancy (5.57). The mean self-regulated learning scores for students with negative discrepancies were: elaboration ($M=4.21$; $SD=.53$), organization ($M=3.25$; $SD=1.11$), rehearsal ($M=3.93$; $SD=.73$), and metacognitive self-regulation ($M=3.84$; $SD=.59$). The scores for the student with the positive discrepancy were: elaboration (4.83), organization (3.50), rehearsal (4.00), and metacognitive self-regulation (3.30). Based on these results, perhaps students who portray unrealistic optimism possess a lower aptitude for regulating their learning. Future research with other populations is warranted.

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A Multinational Comparison of Experiential Learning Theory in Practice

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A cross-cultural, multinational comparative look at undergraduate programs in colleges of agriculture provides a glimpse into the experiential learning applications that are taking place in today's educational systems. Following two, short-term study abroad experiences, a short qualitative study was undertaken to identify the instructional methods and hands-on learning opportunities that are supporting agricultural science education in three countries, the United States, Costa Rica, and Honduras. This study does not aim to critically evaluate the methods of each country, rather it serves as an overview of the instructional techniques that overlap or differ among countries. Ideally, all education grounded in experiential learning theory would provide all four facets: thinking, doing, feeling, and watching. The practices witnessed in this review were doing and watching, with limited data on feelings from personal interactions with students. In the United States, colleges and universities have been pressured to find new ways of incorporating these facets, be it through online technology, industry interactions, and/or internship or apprenticeship programs. Similarly, universities in Costa Rica and Honduras have sought opportunities for technology to offer real-life experiences as well as internship programs for senior level students. However it was found that these two countries spend much more time on traditional agricultural practice including school farms and outdoor labs as a means of instruction. Deliverables from this study are recommendations for educators of agricultural science education in the United

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States in order to create interconnected university settings, build understanding among diverse learning populations, and best prepare for a global workforce.

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Competitiveness and Animal Science Judging: Psychological Indices of Performance

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A competitive mindset is essential to successfully achieve in sport. Unlike sport, where mental and physical skills are required, judging students rely solely on mental skills. Consequently, psychological assessments used in sport may also prove useful for evaluating judging students. Therefore, this study quantified the competitive mindset of judging competitors, and determined the efficacy of psychological inventories in identifying judging performance. Following written informed consent, a multidimensional battery of psychometric inventories were administered to 265 collegiate judging participants (161 males, 104 females; mean age 21.3 \pm 2.2 yrs) from 13 universities. Each battery consisted of the Profile of Mood States, the Sports Attitude Inventory, the Sport Competition Anxiety Test, the Controlled Repression-Sensitization Scale, Levenson's Locus of Control Scale, and the Psychological Skills Inventory for Sport. Coaches ranked subjects by judging proficiency (high, moderate, low). Data were analyzed by skill level, gender and judging event. Wilks' Lambda criterion indicated significant main effects across skill level ($F_{42,396} = 1.66$; $P = 0.007$) and judging event ($F_{25,196} = 2.07$; $P = 0.003$), but not gender ($F_{25,196} = 1.27$; $P = 0.19$). Highly-ranked competitors exhibited significantly less tension, depression, anger, fatigue, and confusion, and significantly greater anxiety management, concentration, confidence, motivation, power-orientation, focus, and internalism than lower-ranked peers. Discriminant function analysis revealed 88% of competitors were correctly classified according to skill level by predictor variables. Results indicate that psychometric sport inventories may provide coaches the potential for identifying and predicting a student's capacity to compete in a judging environment.

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Change in Students' Diversity Awareness Profile: What Evidence Can Journaling and Reflections Provide?

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The purpose of this study was to describe change in students' Diversity Awareness Profile (DAP) scores based on evidence provided in their weekly journaling and opening reflections. Forty-two students, enrolled in a cultural literacy course at The Ohio State University, were the subjects of this fifteen-week study. Using the DAP, researchers conducted a pre- and post-assessment of each student to identify their position on the cultural proficiency continuum (*naïve-perpetuator-avoider-change agent-fighter*). In addition, students were asked to submit a journal entry each week given one parameter - to use the critical thinking stem provided during the first class session. Finally, opening reflections were a part of every class session; students were randomly assigned an opening reflection. At the beginning of each class session, the student in charge presented material to the class and provided a question(s) to ponder for a five-minute writing prompt. These three instruments, the DAP, journal, and reflection, were used to describe students' movement along the cultural competency continuum. Over the fifteen-week course, students provided evidence such as "I should show more acceptances to other people of different religions." This was a quote from one student who was classified as a *perpetuator*, someone who reinforces racism and prejudice, on the DAP pre-assessment; indicating positive movement towards *change agents*, someone who feels compelled to eliminate racism by challenging forms of discrimination when witnessed. The mean pre-DAP score of students was 74.21 (*change agents*) after a semester's worth of cultural education, students mean post-DAP score was 84 (*fighters*).

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Towards Cultural Proficiency: The Value of Service Learning To Students' Advancement along the Cultural Proficiency Continuum

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The purpose of this study was to describe the value of service-learning experiences to students' advancement

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along the cultural proficiency continuum. Forty-two students, enrolled in a fifteen-week cultural proficiency course at The Ohio State University, became the population for this study. Students were asked to conduct 20 hours of service-learning at a venue selected from approximately 18 choices. Students identified 15 benchmarks (from three standards) they hoped to meet through their service-learning experience. Upon completion of the weekly service-learning hours, students identified evidence (what they did or said and/or what the participants at the service-learning sites did or said) of meeting the benchmarks. Qualitative data were analyzed to address student's advancement in cultural proficiency. In reference to meeting the benchmark, *a culturally competent individual must understand the history of oppressed groups*, one student reflected on the individuals he was serving at a food pantry, and how "severe the cycle of generational poverty can be in any given family." Another student working with elementary students in an after-school program mentioned, "a Chinese student did not look the teacher or myself in the eyes when speaking. I was offended at first, but then had to understand that this could be her culture and ways;" which meets the following benchmark- *demonstrate an awareness and understanding of the ways in which culture influences one's actions and other's perceptions of you*. Through the proposed benchmarks, students were able to show their understanding of cultural proficiency and to practice the concepts discussed during the course.

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Creating Critical Thinkers through Explicit Instruction

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The Common Core State Standards are preparing students for college and career by developing the critical analysis skills of students in elementary, middle and high school. Students will be entering college and career better equipped to analyze, evaluate and synthesize problems and issues in agriculture and be able to express orally and written their thoughtful, evidence based claims and arguments. Participants will learn how to explicitly teach critical thinking skills by differentiating between lower level thinking and higher level thinking skills. Participants will learn the six components of critical thinking based on the research of Facione (1990). Participants will learn how explicit instruction in these areas; Interpretation, Analysis, Evaluation, Inference, Explanation, Self-

Regulation, are necessary if we are to foster critical readers and critical consumers of information. Participants will delve into current issues in agriculture to practice the facilitation of critical thinking and how it can easily be infused into course discussions, assessments and expectations.

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Integrating Research Projects into Undergraduate Courses on Organic and Sustainable Crop Production

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Undergraduate students enrolled in the organic and sustainable crop production program in the Horticultural Sciences Department at University of Florida have consistently shown strong interest in active hands-on learning. As an integrative tool, student research projects are implemented into the courses to foster and enhance student learning to meet their needs. In two of the organic and sustainable crop production courses, research project assignments are designed to let students develop field experiments in the teaching garden through group efforts. Each group is required to formulate research objectives and design their own experiments, for example, to compare the performance of different crops and cultivars under organic production or to evaluate different production management practices and systems. By the end of the semester, each group will submit their research report. In addition, students will explain their research experiment and interesting observations in the field. The organic food market survey project is another research assignment that helps engage students in active learning. In this assignment, each team will conduct a survey of a specific marketplace in town to investigate the market share of organic foods and unique characteristics of the organic food market in a local environment. Results will be compared with data at the national level. Specific research objectives and procedures are provided by the instructor to guide students. Successful implementations of these research projects have demonstrated their effectiveness of engaging students in critical thinking, problem solving, and interdisciplinary learning in the context of holistic thinking.

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Factors Affecting Students' Choices to Attend University Career Fairs

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Career Fairs are a common method of introducing university students to prospective employers and find both job opportunities and internships. However, little research can be found in the permanent literature on the influences that students have in making the decision to attend. Additionally, universities frequently offer both general fairs, and events tuned for specific majors. The Career Services division at a regional university has conducted exit polls at numerous career fair events over the past decade, cataloging self-reported influencers of students' decisions to attend. However, until recently no researcher has taken advantage of these data to answer key questions on how to more effectively market career fair events to students. Analysis indicates that students were overwhelmingly (78%) influenced by their professors in discovering career fair opportunities, followed by the Career Services division's online job notification system. Paid advertisements in the student newspaper had the lowest rating, with less than 5% of attending students indicating that they saw an ad. Based on the results of this study, Career Fair planners can more effectively use their budget to reach students. Additionally, holding focused career fairs in the areas of teaching, agricultural and industrial technology, criminal justice, business, nursing, and graduate and professional school can be effective ways to increase student satisfaction with their career fair experience.

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An Analysis of Genetically Modified Organism Acceptability in Europe: A Case Study of Perceptions of the Belgium Potato Event

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Europeans hold a strong resistance to genetically modified organisms (GMO). Despite biotechnology advancements in the United States' and other countries, European Union (EU) policymakers continue to argue over market-driven GMO regulations. Because humans depend on agriculture for survival, they tend to be concerned with the fundamental risk of combining agricultural production and scientific/technological advancements. In 2011, Belgium scientists at a large research institution

planted a field trial of GM potatoes (during this time GM foods were not in the market). On May 29, an activist group arrived at the field and uprooted the potatoes. The event resulted in scientific damage, a court trial for defacing government property, and mixed perceptions among the public. This study examined the perceptions, knowledge, and awareness of GMOs among a purposive sample of Belgian public to determine the need for educational programs concerning GMOs. Ten emergent themes occurred: 1) variation in GMO definitions; 2) concerns about potential economic risks; 3) concerns about potential environmental risks; 4) media influence; 5) government involvement; 6) public perceptions/opinions; 7) potato event impact; 8) perception of medical biotechnology; 9) awareness of GM food; and 10) concerns about potential health risks. All respondents recognized that a GMO was genetically engineered for a specific purpose such as higher yield, lower costs, and less negative environmental impact. Many respondents noted the primary reason behind the activist actions was fear of monopolistic corporations. These findings support the conclusion that educational programs about GMOs will provide the Belgian, and perhaps US, public with objective knowledge to guide perceptions, knowledge, and awareness of GMOs.

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Embracing Distance Education for the Future

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Education continually evolves in response to advances in pedagogy and technology. While distance education and online courses are hardly new, they represent an irreversible trend in higher education that will continue to grow well into the future. Moreover, distance delivery of education, training and outreach programs offers unique opportunities to support broader local, state, national and international goals of land-grant colleges and universities. The University of Hawai'i at Mānoa's College of Tropical Agriculture and Human Resources (CTAHR) has embarked on a multi-year program to increase its online course offerings to reach not only a broader base of students on the Mānoa campus, but to share those courses with other students across the ten-campus University of Hawai'i (UH) system, taught by CTAHR's faculty at Mānoa and on the neighbor islands. Distance delivery also has enabled CTAHR to offer professional development courses to its extension agents across the Hawaiian island chain and has helped CTAHR's extension faculty increase stakeholder access to its cooperative extension services. Though not realized so far, other benefits that should accrue from distance delivery are

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better articulation of courses across the UH system and greater standardization of outreach and training modules offered through the college's extension service. Through the college's new international program, distance delivery will help CTAHR reach students and researchers across the Asia-Pacific region. In its first year, CTAHR's Distance Education Program has worked with faculty to develop and implement online courses. Future plans include adding additional online courses as well as working with Extension Programs.

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Informing the Development of Food Safety Competency Integration in the Undergraduate Agricultural Education Curriculum

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Agricultural Education in Tennessee is facing many changes, brought about by everything from the integration of the Common Core Standards Initiative to the Complete College Tennessee Act. What has not changed is Tennessee State University's dedication to its mission to educate, research, and disseminate knowledge of agriculture to diverse communities through a variety of avenues. One such avenue for disseminating information is the development of school-based agricultural educators for secondary agricultural education. To effectively prepare future secondary school-based agricultural educators, TSU needs to ensure curricula are relevant, rigorous, and applicable in content and objectives. The objectives guiding the research we will present were to (1) gauge teacher interests and intentions regarding the new Food Science and Safety Pathway being introduced by the state of Tennessee, and to (2) identify current and expected food science/food safety integration that could take place in current courses and topics being taught. Data was collected via survey research from (n = 200) teachers, in-person at the State FFA Convention Career Show. Data were analyzed to inform curriculum revisions that need to be made in our undergraduate agricultural education program. These revisions will improve preparation of future teachers/agricultural education students for successfully disseminating information via the new Food Science and Safety Pathway in Tennessee and by integrating food safety concepts in current curricula being offered in the

state. Findings and recommendations for curriculum revisions to the TSU undergraduate and graduate Agricultural and Extension Education curriculum will be presented.

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Assessment of Undergraduate Research Credit

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While undergraduate research may provide engaging learning opportunities, research is needed to explore the evaluation of these experiences. The aim of this study was to examine assessment methods used to evaluate undergraduate students who participated in research activities for course credit during the fall 2013 through the College of Agricultural and Life Sciences (CALs), University of Florida. Identified undergraduates (n=210) were contacted, and 63 (30%)(47F, 16M) completed a 14-item questionnaire administered through SurveyMonkey™. Tenured and tenure-accruing faculty members from CALs (n=31) who supervised undergraduate research for credit completed a 9-item questionnaire through SurveyMonkey™. Student respondents were registered for, on average, a two credit hour course and were expected to participate in 4 hours of research activities per credit per week. Student respondents reported that they did not receive a syllabus from their research supervisor (87%) and those who did (13%) indicated their final grade was determined by attendance and participation only. However, they reported that their research supervisor met with them or informed them of their expectations (89%) and 62% were informed how their final grade would be assigned. Faculty supervised, on average, two undergraduate students during the fall semester and most faculty (94%) reported that they did not distribute a syllabi to their undergraduates registered for research credit. Results suggest that course credits for undergraduate research are not being clearly assessed for knowledge and/or skill gains. College standards are needed for undergraduate research activities for course credit.

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Building Global Competency of International Students and their Visiting Professors

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Participating in international teaching is thought to enhance the global and cultural competency of faculty. However, little research has been carried out on the impact on the students being taught by professors from abroad. Our aim was to examine the attitudes and learning experiences of students in the Masters in Applied Human Nutrition Program at Hawassa University, Ethiopia who have been taught nutrition courses by faculty from North American and European universities. Participants (n=26) participated in a focus group following their first experience with a visiting professor and the following year, after being taught three or more courses by visiting professors, completed an online questionnaire through SurveyMonkey® regarding their learning experiences. Focus group participants reported no cultural differences between their visiting professors and themselves, as their interactions were limited to a classroom environment and students acknowledged the benefit of having visiting faculty from abroad largely due to their expertise in the field. In the follow-up survey (n=10; 38.5% response rate), 90% agreed or strongly agreed that the professors from abroad enhanced the program and were experts in their field, and 60% indicated cultural differences existed between the professors and themselves. These included expected classroom behavior, dietary differences, and culturally-biased content in curriculum. In conclusion, this study suggests that recognition of cultural differences by students taught by visiting faculty increases with time, whereas respect for their expertise is maintained.

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Leveraging Experiential Learning in the form of Legacy Projects to Improve Undergraduates' Ecological Worldview and Level of Environmental Concern

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As anthropogenic environmental problems intensify, the need for environmental education resulting in pro-environmental attitude and behavioral changes in stu-

dents is growing. It is proposed that legacy projects are a tool that could positively impact students' pro-environmental attitude. Legacy projects, experiential in nature, leverage the principle that affective and cognitive learning are enmeshed elements of a single learning process. Legacy projects are an ongoing service learning opportunities where the instructor works with a community partner for consecutive semesters with different student cohorts. An environmentally focused legacy project was pilot tested with a population of students enrolled in an Introduction to Environmental Studies and Agriscience section at Michigan State University to determine if students' environmental attitudes would be greater as measured by the New Ecological Paradigm (NEP) than a control section of the same course (nonequivalent control group design). The NEP is a widely accepted instrument that measures participants' ecological worldview. Students enrolled in both sections were pre-tested and post-tested with the NEP. Data were analyzed using an ANCOVA using the pre-test as the covariate. The mean post-test NEP score for the legacy project section was 60.26 while the mean post-test NEP score for the control section was 56.33. The post-test NEP ANCOVA was statistically significant ($p < .001$) indicating that the legacy project section had a statistically significant more favorable ecological world view than the control. Although more study is necessary, the results of this pilot show that environmentally focused legacy projects could be a viable classroom method for increasing students' pro-environmental attitudes.

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Pennsylvania Veterinarian Perspectives of Antibiotic Use and Antibiotic Resistance for Use in the Development of Educational Materials and Programming

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Antibiotic drugs have been used for over 50 years and have proven to be valuable in preserving human and animal health. With an increase in antibiotic use and availability, antibiotic resistance has become a public health concern and has received much attention from government agencies, public interest groups, and the media. The purpose of this study was to explore the knowledge, beliefs, and practices of Pennsylvania veterinarians regarding antibiotic use and antibiotic re-

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sistance, with the aim to facilitate the development of educational programs and strategies for the prudent use of antibiotics, and increase stakeholder and public awareness. A descriptive-correlational research design was used, and survey instruments were designed to capture the perspectives of two groups of veterinarians: Group 1 – food/large animal vets, and Group 2 – all other vets. The surveys collected demographic information, veterinarian perspectives across five dimensions (Antibiotic Resistance, Antibiotic Use, Veterinary Clientele, the General Public, and Veterinarian Practices), and perspectives of available educational resources. Veterinarians attending the PVMA Keystone conference completed 66 usable paper surveys, and veterinarians contacted via email listservs completed 284 usable electronic surveys. Findings indicated a need for development and dissemination of educational materials and programming for veterinarians, stakeholders, and the public. It is the hope that the descriptive findings of this study will stimulate thought and discussion among veterinary professionals, university faculty, and other stakeholders. The necessity for curriculum changes and course development in animal and veterinary science programs regarding current agricultural issues were also recommended.

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Effect of Simulated Food Processing Plant Video Tours on Student Engagement and Learning Outcomes

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An innovative approach was used to teach students how to evaluate food-processing facilities for food safety practices known as Good Manufacturing Practices (GMPs) in online courses. This ADDIE model was used to create several simulated video tours of a nearby food processing facility for a junior-level college course on GMPs. The Learning Object Evaluation Scale for Students (LOES-S) was used to collect qualitative and quantitative feedback from students. Students liked the interactive nature of the simulated tour videos and said they were easy to use and they appreciated these opportunities to "gain experience with (processing plant) evaluations." They also mentioned they liked the new lecture videos. A couple of students indicated they looked forward to watching the animations, music and graphics in the videos. Quantitatively speaking, the simulated tour videos were consistently rated higher than the lecture videos and Moodle books for their levels of learning, quality and engagement. The lecture videos received slightly higher overall preferences than the

Moodle books. Statistical comparisons are forthcoming, as it is expected these favorable reviews will result in not only higher learning outcomes but also increased enrollment in the course and thus better recruitment into food safety careers.

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Engaging Students in Plant Science Courses by Utilizing the Mini-Horhizotron: An Apparatus for Observation and Study of Plant Root Systems

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The mini-Horhizotron was designed for students to have the ability to observe and study root growth, in situ, of seedlings and small herbaceous or woody plants. The mini-Horhizotron design has three clear-sided arms extending away from the center that could be filled with the same substrate or filled separately with different substrates to observe root growth response from a single plant. The objective of the initial use of the mini-Horhizotrons was to incorporate their usage in undergraduate plant science courses to test the feasibility of observing the unseen dynamic world of plant root growth and other plant-soil interactions that currently are difficult to observe and study first-hand in a classroom setting. The mini-Horhizotrons were used in Horticulture and Plant Biology undergraduate courses to engage students in visual learning exercises. Utilization of these devices in numerous experimental projects in these courses allowed students to observe differences in root type, architecture, root hairs, root disease symptomology, soil insect larva development, allelopathic root responses, as well as other points-of-interest that were being taught in the courses. Student assessment of the utilization of this teaching tool was overwhelming positive with 87% stating that they had never seen real life plant-soil-root interactions in any previous course. The mini-Horhizotrons are a teaching tool that can be used in many plant science and biology courses to teach about plant growth and developmental processes below the soil line that go largely unseen and unnoticed.

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Survey Results from the Hands-On Agriculture Learning Day at Lincoln University

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Students develop better critical thinking skills by experiencing science hands-on rather than relying on memory and abstract learning. Therefore, our objective was to determine if experiential learning in various fields of agriculture increases participant knowledge. We surveyed participants ($n = 288$) ages 10 to 13 that attended the Hands-On Agriculture Learning Day at Lincoln University in November, 2013. An 18-question descriptive pre-test survey was given to students before engaging in hands-on activities covering animal science, entomology, aquaculture, and hydroponics. The same post-test was given one week later. A higher percentage ($P \leq 0.05$) of students responded correctly post-test vs. pre-test when asked if agriculture was another word used when talking about farming, if goats and sheep get worms from eating worm eggs and larva on grass, if it is important for farmers to give immunizations to their animals, and if entomology is the scientific study of insects. A higher percentage of students tended ($P \leq 0.10$) to answer correctly post-test vs. pre-test when asked if hydroponics is a branch of agronomy and if sheep prefer to eat grasses and goats prefer to eat bushes. When asked if goats and sheep get worms from eating worm eggs and larva on grass and if insect blood is just like human blood, a higher percentage ($P \leq 0.05$) of females answered correctly than males. Furthermore, various gender effects ($P \leq 0.05$) were observed for other questions. Therefore, experiential learning may increase knowledge depending on the questions asked and the gender of the student.

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Creating Reusable Learning Objects ~ What the Authors Think

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Curriculum initiatives are a continual cycle in education that changes course content and instructional methods and places additional responsibilities on teachers. Within colleges of agriculture, instructors are working to design curriculum to fulfill the global competence initiative prescribed by the National Research Council in 2009. One way to meet this initiative is through the use of Reusable

Learning Objects (RLOs). RLOs are “small (relative to the size of an entire course) instructional components that can be reused a number of times in different learning contexts” (Wiley, 2000, p.3). This qualitative study sought to understand the experiences of one cohort of authors who have designed and disseminated globally focused RLOs following a first time faculty study abroad experience. It was found that most of the participants were unfamiliar with the term RLO; however all had previous experiences with creating short content presentations. These authors shared strategies to mine data for their RLOs including online databases and university supported technology. Additionally, authors identified challenges with RLO development including lack of comfort with technology, and fitting RLOs into existing hard science courses in ways that made sense for the overall goal of the course. Overall, this cohort believes RLOs should be used to infuse global education within colleges of agriculture. However here, RLOs were better used as supplements, and not focal points of a lesson. This preliminary inquiry into the authors’ perspective can aid facilitators of curriculum development to provide the most supportive environment for authors, hopefully ensuring smoother development and implementation.

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Focusing on the First Year

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Study abroad programs are a popular way to engage upperclassman within curriculum. However, these international experiences offer great opportunities in terms of social development and general self-efficacy for underclassman, specifically freshman, as well. With the continued challenges of engaging freshman in order to keep them involved and in college past that first year, it has become important to understand how study abroad can serve as a catalyst for engagement. Thus, a two-week program to South America was developed to test the effectiveness of such a model with first-semester freshmen. After six years, the program has proven such an early opportunity allows for curriculum to build upon experiences rather than waiting until the end of a degree to reflect. Participating freshmen tended to not be distracted by other college experiences and were more willing to take on such an adventure. Being so early in their development allowed them to explore the curriculum with open minds. Observations also uncovered that studying abroad so early in a college career further cleaved students from their past and established more independence, leading to higher retention rates. Comments from the 107 student participants indicated that 100% are cur-

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rently enrolled or have graduated, 88% in the college hosting the program. It was also found that 78% said they either studied abroad again or intended to in the future. Students indicated the program was a springboard for further experiences. This model can be implemented into any curriculum allowing for heightened engagement and development of college freshman.

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Description of Curriculum for Agricultural Science Education (CASE) Units of Instruction Completed By Certified CASE Instructors in Secondary Agriculture Classrooms

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A Curriculum for Agricultural Science Education (CASE) course is designed to provide 160 days of secondary agriculture classroom instruction. The purpose of this study was to describe the number of CASE units of instruction being completed by CASE certified teachers in either a Plant Science or an Animal Science CASE course, after the teacher completes a CASE training and implements the curriculum. In classroom environments when an entire course is not completed, this descriptive study was also designed to describe potential obstacles to course completion as identified by CASE certified instructors. Many teachers reported less than 100% completion of all units of instruction. Teachers reported multiple obstacles to completion of the curriculum, some of which included: running out of time, not having sufficient equipment for some of the activities, trimester schedules not allowing more than 12 weeks of instruction, and cost of materials to complete all activities in the curriculum. The units most widely taught included unit 4 (anatomy and physiology) in the Plant Science curriculum, and units 2 (history and use of animals) and 3 (animal handling and safety) in the Animal Science curriculum.

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Describing the Number of Curriculum for Agricultural Science Education (CASE) Schools in each State, and Support from Land Grant Institutions and State Departments of Education

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The Ohio State University

The objectives of this study were to describe the number of secondary schools in each state that have implement-

ed Curriculum for Agricultural Science Education (CASE) and the number of secondary agriculture teachers that have been certified in each state to teach CASE. In addition, the study was designed to describe support for CASE curriculum as evidenced by land grant universities hosting CASE institutes, and to describe types of support for CASE curriculum from state departments of education. Data were collected from CASE, land grant institutions and state departments of education. Color-coding on a map was used to indicate the number of CASE certified instructors, number of land grant hosted institutions, and, types of support from departments of education. Data on CASE certifications show 679 teachers certified in at least one CASE course representing 32 states. Iowa and Oregon are shown to have the highest number of CASE teacher certifications. The number of CASE certified teachers is higher in states where the land grant institution hosts CASE institutes, or in states that show various types of state department of education support.

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Course Attributes that Foster Student Interest And Success in a Blended Introductory Animal Science Course

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University of Tennessee at Martin

The objective of this study was to determine course attributes that increase student interest and success in a blended introductory animal science course. A questionnaire was administered to 504 students over 6 semesters. There were 412 students in the classroom and 92 online students. Components used to foster student success included: Blackboard Learn™ discussion board, chat room and assessment tools, Echo360® classroom and personal capture, StudyMate® Author, current news and information, and a student instructor. Chi Squared and T-tests were used to identify relationships among variables. Discussion board forums and chat room sessions connected on-campus and online students. Online students felt more connected to the campus when viewing recorded lectures made using Echo360® classroom capture compared to recordings made using personal capture. Students (83.2%) felt that discussion board forums and current news articles made the course more interesting. StudyMate® questions were used by 87.9% of students to help prepare for tests, and flash cards were the most popular (75.2%). Students attributed better scores on tests to participation in chat room study sessions (35.9%), getting help from the student instructor (35.6%) and the use of StudyMate® questions (61.4%). Students that completed multiple (up to 3) at-

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tempts at weekly online homework assignments had higher ($P < 0.001$) scores than students that made a single attempt, and this contributed to significantly higher test scores. However, actual course final grades were significantly lower than student's expectations of their final grades. Incorporating innovative features into a blended introductory animal science course can increase student interest and improve student performance.

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Cooperative Extension Service Perceptions of Incorporating Infographics into Public Educational Materials

Hayley G. Jernigan,* Julie C. Robinson and Leslie D. Edgar
University of Arkansas

The Cooperative Extension Service has increased their focus on communicating visually to improve education strategies to meet public demand. Infographics are becoming a progressive form of this visual communications movement. The use of information presented graphically assists with increased understanding through condensed graphical information. The incorporation of infographics into instruction allows educators and experts to quickly report program impacts to stake holders visually. Additionally, infographics training creates experiential learning opportunities for post-secondary education faculty to teach Extension personnel new technology software that may increase Extension outreach. A southern state's Cooperative Extension Service recently held a professional development conference for extension faculty, staff, and specialists. A portion of conference attendees completed two workshop sessions on the use of infographics ($N = 9$). Participants were asked to complete a pre- and post-tests describing their knowledge and perceptions of infographics, especially related to possible uses of these graphical elements in Extension. Extension professionals who participated in the workshop reported an increase in the following areas: "I have seen an infographic", "I have used an infographic", "I have created an infographic". The workshop provided an opportunity for participants to gain infographics exposure and applications available for creating infographics. Participants reported an increase in their perceived value of using infographics to report and promote program impacts. Workshop participants also reported that infographics could be useful for teaching the public about agriculture. Results from the pre- and post-test may help instructors develop implementation practices in the future. Lessons learned should be shared with post-secondary educators.

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Developing a Diversity of Culturally Competent Leaders in Agricultural Science

Pamala Morris and Myron McClure
Purdue University

College students who start in the sciences then transfer into non-STEM majors or leave school completely is often due to the conflict they experience between "the enduring sense of who they are and who they want to become" and their perceptions on how they fit into the STEM workforce (Cobb 2004). An individual's various social identities--sex, race, gender, age, socioeconomic class, religion, and ability, among others--shape their attitudes, behaviors, worldviews, and experiences. Students are motivated to identify with social groups (Brewer, 1999). We assert that students leaving the sciences early have not developed and integrated a science identity into their other social identities. The primary goal of our MSP program is to successfully train a cohort of underrepresented culturally competent leaders in the Agricultural Sciences. Our MSP program objectives are: 1. Recruit, retain, and graduate URMs into the food and agricultural sciences at Purdue. 2. Structure a program that assists students to adapt to social, academic, and cultural environments within the college and university. 3. Expand students' social identities to include identities associated with being a student, scientist and academic or industry professional. 4. Develop human capital by engaging students in transformational learning experiences. Qualitative and quantitative data will allow triangulation of evidence around key themes. Assessment findings will be compared with those of non-cohort students with similar backgrounds. We believe these steps will lead to students becoming ambassadors for their own success, demonstrated through good grades and rewarding STEM career options.

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Peer Evaluation: Developing an Instrument for Effective Feedback

Kyle W. Ferrell and Foy D. Mills, Jr
Sam Houston State University

It is critical to hold individual students accountable for their learning in collaborative, cooperative or team-based learning. Though all group learning is not equal, peer evaluation is the accountability method used in team-based learning. However, the peer assessment process can be cumbersome for student and faculty alike. Con-

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sequently, the need arose for an efficient peer evaluation tool to 1) enhance student reporting, 2) reduce recording time and increase accuracy in grading and 3) provide timely, effective feedback to students. Google Forms™, a readily available and inexpensive platform, was used to develop an electronic survey instrument. Students access the survey from a secure on-line platform to maintain peer-to-peer anonymity and to meet FERPA guidelines. Students are expected to rank each peer's performance in eight categories using a 1-5 Likert scale. Students provide written comments and an overall performance grade for each peer on a scale of 1-10. Data is downloaded as an Excel file eliminating transcription errors. Data is analyzed and an individual report is returned to each student via Blackboard. A time and motion study compared the paper and electronic-based evaluation tools. Time involved in data analysis and responding to 70 students was reduced by 72% using the electronic-based tool. This facilitated more timely feedback to students. Adjustments and redeployment of the instrument in a new semester took less than 5% of the time required to develop the original electronic instrument. Students reported a preference for the electronic format over the paper instrument at a rate of 96%.

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Effectiveness of a Residential Summer Camp in Promoting STEM Education and Careers

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The Department of Agricultural and Industrial Sciences at Sam Houston State University hosted a Science, Technology, Engineering, and Math (STEM) summer camp for high school students (n=28) from southeast Texas. This was a five-day residential camp during which campers participated in hands-on, experiential activities associated with animal and plant sciences, food safety, engineering, and renewable energy technologies. A survey was administered to students on the first and last days of camp to determine the effectiveness of the camp. A five-point Likert scale (1=strongly disagree; 5=strongly agree) was used to assess students' interest in pursuing a degree in STEM, interest in pursuing a career in STEM, and interest in the various topics highlighted during the camp. Means for identical questions on the pre- and post-camp surveys were calculated and compared using the GLM procedure of SAS. Camp participants' general interest in STEM, interest in pursuing a degree in STEM, and interest in pursuing a career in STEM increased numerically on the post-camp survey, however, these differences were not significant. In re-

gard to the specific topics highlighted during the camp, computer-aided design showed a significant increase ($P<0.01$) in interest on the post-camp survey while camp participants' interest in the other topics highlighted during the camp increased numerically. In addition, 93% of camp participants indicated they would definitely recommend the camp to their classmates. Results of this study indicate that a summer camp for high school students could be an effective method of generating interest in STEM-related fields of study and careers.

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Impact of Course Format on High School Students Taking University Credits

Bonnie S Walters
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Options for high school students wanting to get University credits has been increasing over many years. One course that counts as a general education science course is now being offered using three different formats. The course has been taught using Interactive television (ITV), hybrid and on-line formats. The ITV format has television sites at the high school and a corresponding site at the University. The hybrid format is also dual credit and counts for high school science credit at the same time it counts for University credit. This is an on-line format from the University and in-class with the high school teacher 1-2 days per week. The on-line course was taught with high school students, traditional college students, and nontraditional college students. The high school students all received 3 university credits at the completion of the course regardless of format. Student attitude was an important factor in student success. High school students who met the instructor prior to the start of the course were more interactive during the ITV course. Students taking the course with on-line components needed to have a more proactive attitude and be more self-motivated than the ITV course students. The hybrid course students did have the in-class high school instructor to assist them in motivation. Overall, high school student success in University courses is possible but is impacted by student attitude and course format.

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Testing the Water: Using Formative Assessment Tools to Monitor and Improve Student Learning

Tim Buttles
University of Wisconsin

Formative assessment techniques can improve learning by providing feedback to teachers and learners during the learning process. Unlike summative assessments that occur at the end of the learning process, formative assessments happen in time to change the course of the learning process. This feedback allows the teacher to focus on addressing the content that learners' are struggling with while the learners receive feedback on their level of understanding. A wide range of formative assessment tools exist that can be adapted to fit most settings. Some strategies work well at the start of a course or topic to identify students' prior learning and misconceptions. Other strategies give learners the opportunity to identify concepts they are struggling with. Many strategies are quick to implement, taking only minutes at the start or end of a class sessions. Others provide more in-depth involvement and serve double duty as student-centered active learning techniques. This presentation will provide examples of formative assessment techniques for a range of course levels and settings ranging from freshman level courses in a traditional classroom to online graduate level courses. Examples of formative assessment tools will span a range of technology levels as well.

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Greenhouse Engineering/Technology Learning Modules

Peter Ling, A.J. Both, Murat Kacira, Emily Buck, Robin Brumfield, Peter Davidson, Gene Giacomelli, Chieri Kubota and Margret McMahan
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Controlled environment plant production (CEPP) is an important agriculture sector commonly represented by food crop and ornamental productions in greenhouses. With the demand of high quality vegetable and ornamental products, the industry projects to grow at an annual rate of 5% between 2007 and 2012. Increasing global competition, however, has slowed US industry growth while the global competitors are fast expanding. Working with our stakeholders, we have identified needs and challenges to improve the industry's global competitive-

ness. It was concluded that the universities with expertise in horticultural engineering area must work collaboratively to poll the limited and scattered expertise in the country to meet the industry's engineering/technology educational needs. While there is no existing CEPP engineering curriculum in the country, development of comprehensive teaching materials to seed future developments of CEPP engineering/technology curricula is paramount. Three universities has led an collaborative effort in the development of more than 53 teaching modules that can be used for presenting CEPP engineering perspectives with a focus on interactions between plant physiology, engineering physics, and economics. By learning available tools and understanding how the tools work, we expect the students will help to improve greenhouse and other CEPP operations' profitability, and in turn improve their own market values thus attracting more people to the profession.

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A Different Approach to a Midterm Examination

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Mississippi State University

Traditionally, midterm examinations are used to evaluate and provide feedback about student performance at the midpoint of the semester. Midterm examinations can be used as motivating tools to encourage students to improve class performance, which ultimately impacts their final grade. However, midterm examinations also provide an opportunity for instructors to seek student input on how to improve their teaching performance as well. Rather than giving a traditional midterm, the "Teacher Midterm" was administered to an undergraduate agriculture teaching methods course that included a total of 86 students in both fall and spring semesters. Questions asked in the "Teacher Midterm" included identifying teaching strengths of the instructor, describing areas for improving instruction, and analyzing student attitudes toward the subject matter. Students were also asked to identify how much time students spent on class assignments or projects. Results included that the instructor was able to connect course content to student learning experiences, the instructor was able to put course content into practice, that the number of group activities in the class should be reduced, and that the online course management site should be improved. While the university uses an excellent course evaluation tool where students can report their feelings and attitudes about the course and instructor, the results are given after the semester ends, giving little to no chance for instructors to make course changes with the current students. Using a "Teacher Midterm" helps instructors identify valuable information

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where instructional changes can be made to become a more effective instructor to students.

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USDA National Needs in Forensic Plant Pathology: Enhancing U.S. Crop Biosecurity through Multidisciplinary Graduate Education, Experience and Research

J. Fletcher,* A. Wayadande, L.M. Ma, F. Ochoa Corona, R. Kaundal, U. Melcher, C. Garzon and R. Allen
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In 2001, following the mailings of virulent anthrax spores to targeted U.S. government officials, the need for enhanced capabilities in microbial forensics became apparent as investigators lacked technology needed to attribute those crimes. The anthrax incident, and the previous week's airplane attacks on the World Trade Center and Pentagon, led the U.S. defense and security communities to enhance the security of critical national infrastructures, including agricultural systems. The National Institute for Microbial Forensics & Food and Agricultural Biosecurity, at Oklahoma State University, was established as a science provider to the defense community on crop biosecurity and microbial forensics. NIMFFAB scientists uniquely blend the disciplines of plant pathology, biochemistry, molecular biology and forensic science to address these emerging national issues. NIMFFAB faculty and graduate students develop new methods, and adapt and validate existing forensic technologies developed for human DNA testing or other investigative purposes, for use on plant pathogens either in culture or in complex agricultural matrices such as soil, plant tissue or irrigation water. The USDA's National Needs Graduate Fellowship Program, whose mission is to prepare a new cadre of U.S. scientists to enter the workforce in areas of established national need, has been an essential element of this program, supporting the stipends of thirteen OSU/NIMFFAB graduate Fellows over the past 8 years as well as internship experiences at the FBI Laboratory, the Centers for Disease Control & Prevention, and several National Laboratories. Several previous program graduates are now working in the defense/security community in the U.S. Capitol.

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An Exploratory Study of Scrap Learning and De-Learning as Perceived by Experts in Higher Education in Iran

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Higher education has been criticized by learning practitioners on the grounds that higher education in Iran is ineffective. De-learning and scrap learning are concepts that are opening new horizons in education and thus impeding sustainable higher education across universities in Iran. Scrap learning is that type of learning which is not applicable in the work place and that which is not being used by college graduates. De-learning is a concept which means to get rid of old and outdated learning that inhibits the learning of new material. These concepts are not only lacking in knowledge management, it is also happening in higher education in Iran. Therefore, this exploratory study sought to investigate the concept of scrap and de-learning as perceived by higher education experts in Iran. A three round of Delphi technique was used to reach consensus among 30 experts on scrap and de-learning. This study also aimed to propose ways to reduce scrap and de-learning. Results revealed that the major cause of scrap learning in Iranian higher education is ineffective educational planning. Moreover, development policies in higher education have also created scrap learning. Experts further agreed that poor link between higher education and research promotes scrap learning. Experts also agreed that de-learning is different across universities and subject matter. They also noted that de-learning depends on the value of content matter. Based on experts' opinion the following recommendations are provided in order to reduce scrap learning in Iranian higher education system: Continuous upgrading of knowledge, attitude, and skill of faculty members, design and implement effective and objective based training, promote life- long learning, provide academic autonomy, develop a link between research, training, and industry, dispose degree oriented thoughts, and continue upgrading and evaluating curriculum and subject matter by academic experts and fields of industry.

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“Let’s Pick Berries:” An Apsaalooke Community-Based Project Resulting from Use of the Holistic Process in a Service-Learning Course Addresses Nutrition, Plant Propagation, Community Engagement, and Strengthening of Elder-Youth Connections

Tracie Small,* Florence Dunkel, Greta Robison, Tyler Nyman, Durc Setzer, Caleb Killian and Zachary Ostrovsky
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Native American cultures were adversely affected by integration into Western culture. Complex disorders, such as, alcoholism, diabetes, heart diseases are increasing in Native Americans. We tested the hypothesis that using the holistic process, beginning with identifying the community’s desired quality of life (DQL), leads to concrete community actions addressing complex health issues. Thirty-six Apsaalooke Elders described their DQL for Apsaalooke students in AGSC 465R, a Montana State University Core course in research/creative activity. Twenty Apsaalooke 4th graders (Hardin, MT), and 20 high school students (Lodge Grass, MT) described their DQL in participatory drawings. Other AGSC 465R students brainstormed, contributed skills focused on: choke cherry, wild plum, June berry, buffalo berry. Together students linked the Lodge Grass community Berry Patch Project with tribe’s Little Big Horn College. Apsaalooke students successfully implemented the holistic process. Elders suggested reviving traditional berry picking would strengthen connections with youth. Youth verified this using participatory diagramming. During a successful berry picking outing Elders/youth learned nutritional information, e.g., buffalo berries are 200% higher in vitamin C than oranges. The tribal council approved a riparian site for a part-managed, part-wild berry patch walking distance from Lodge Grass. MSU AGSC 465R students in Sustainable Foods contributed plant propagation skills. A GIS student and an architecture student contributed site-development skills. Over 19 months, a concrete, action-oriented, outdoor project emerged connecting Apsaalooke Elders and youth while confirming the importance of place-based knowledge. Preceding similar Apsaalooke projects not using the holistic process, not initiated by Apsaalooke, did not result in community engagement.

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The Role of Traditional Ecological Knowledge in College of Agriculture Courses at Montana State University

Florence Dunkel,* Lora Soderquist and Amy Wright
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Traditional Ecological Knowledge (TEK) and Place-Based Knowledge are both recognized as important components of human knowledge. The objective of this study was to determine the level of awareness and application, in four courses in the College of Agriculture (COA) at Montana State University (MSU), of these forms of knowledge in comparison to knowledge from the ‘modern’ scientific method and/or disciplinary approach used in science, management, and economics. A survey with 7 short-answer questions was given to 114 students over 3 years (2012-2014) in 4 MSU COA courses in 3 departments (Land Resources and Environmental Sciences, Plant Sciences and Plant Pathology, and Animal and Range Science). Students were mainly undergraduates (juniors and seniors). In one of the courses AGSC 465R, a University Core course in Research and Creative Activity, that provided service-learning experiences with indigenous communities and used the holistic process adapted from Savory and Butterfield, students were surveyed both before and after taking the course. Students understood the value of TEK after taking: LRES 421 Holistic Management; AGSC 465R Health, Poverty, Agriculture; and the Range Science courses, but did not see TEK integrated well into the curriculum. Students’ perception was that the scientific and management (natural resource, human resource, infectious disease) communities or disciplines did not well receive TEK. TEK does have a useful place within formal science learning that students are ready to accept, but TEK is not currently provided in most of the agricultural or preparatory sciences curricula at MSU.

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Using the Holistic Process to Assist Students in Undertaking Rural and Urban Renewal in their own Communities

Jamie Sowell, Gizelle Peynado, Akihiro Kuriki, Shane Cottom and Florence Dunkel
Montana State University

Four students in agricultural majors or career paths, committed to contributing positively to their hometowns,

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were without direction on how to initiate positive change. We hypothesized that the holistic process would provide that direction. Using the holistic process and diagrams, specific, personal information (desired quality of life, resources needed to obtain it) was obtained through in-depth interviews with community members in: Kingston, Jamaica (n=10); Nagoya, Japan (n=12); Cave Junction, Oregon (n=20); and Cotton Farms, Dillon, MT (n=10). Populations sampled were bimodal, youth and parents/grandparents. In Kingston, an exceedingly high debt burden coupled with a declining agricultural sector resulted in educated people struggling to provide for their families and resorting to emigration to achieve their desired quality of life. Gizelle begins veterinary school understanding agricultural production for local use is key to attaining her desired quality of life in her home, Jamaica. Shane decided to return to his family ranch, now more clearly understanding mutual dependency with their extended Hispanic family. Jamie now understands stereotypes and how to overcome these to create positive energy in her community that recently lost its post office and police. Akihiro, who chose a career in the agriculture/food sector of his hometown, Nagoya, now knows how separated his generation is from food production, but understands elders may be key to maintaining availability of traditional, local foods. These holistic-process-based interviews in their home communities led these three seniors and a post-bac student to take action based on their carefully nuanced discoveries.

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Using the Holistic Process in a Service-Learning Course to Understand Food Security and “Hunger” in a subsistence farming village in Mali

Florence Dunkel,* Keriba Coulibaly, Rebecca Turley, Carissa Stein, Spencer Jonas, Jacqueline Lebel, Cody Howe and Rhea Henning
Montana State University

Mali ranks third highest worldwide for under-five childhood mortality. Complete-protein malnutrition (kwashiorkor) amplifies severity of main killers of young children, cerebral malaria and diarrhea. Kwashiorkor causes physical/mental stunting and affects 40% of Malian children. We hypothesized that a detailed exploration of cropping systems in a Malian subsistence farming village would provide culturally- and nutritionally-sound solutions to food security and “hunger” (kwashiorkor). Faculty and eight Montana State University (MSU) students living in families multiple times over a 7-year period in one Malian farming village, Sanambele, learned compo-

nents of children’s and adult diets as well as cultural nuances influencing food choices. Students in AGSC 465R Health, Poverty, Agriculture who did not travel, micro-analyzed these data to study nutritional content of children’s current diet and crops grown by villagers. In typical grain-based diets, we calculated a two year old child in Sanambele would not receive estimated minimum required levels of two essential amino acids, tryptophan and lysine. Grasshoppers, traditional children’s snack, we found, would provide enough of these amino acids, but their use was recently discouraged because of pesticides (neurotoxins) used in nearby cotton fields. Seasonal village crops: cashews, peanuts, Bambara ground nuts, milk would work. Chicken was not “kid’s food.” Other livestock were eaten annually only during celebrations. Undergraduates in agricultural sciences, Sustainable Foods/Bioenergy Systems, Liberal Studies, and graduate students in Health Sciences discovered kwashiorkor in this village could be solved by mothers understanding “complete proteins” (amino acid contents) of foods grown in the village and the impact of these food choices.

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Bioenergy Laboratories for Improving Student Engagement

Troy Runge,* Eric Singsaas, Tim Zauche, Chris Baxter and Mark Mailloux
University of Wisconsin

Growing demand for oil, geopolitical concerns, social and environmental pressures necessitate a transition from imported petroleum to renewable liquid fuels, with biofuels planned for a major portion of the nation’s future energy. Meeting future biofuels’ demand will require a trained workforce able to provide the engineering and scientific workforce to operate existing biorefineries as well as educate future generations of scientists to develop future renewable fuels. Agriculture universities and technical schools will need to educate workforce in these areas, but since this is a relatively new area, limited teaching resources have been created and made available to instructors. Our project funded by a USDA Higher Educational Challenge grant looks to increase the amount of educational material by developing twelve bioenergy lab activities and providing the resources online. The materials were designed to be either used to augment existing classes or as a stand-alone bioenergy lab class. All of the labs were designed to be low cost experimental investigation to maximize the number of students that can participate and their involvement in the activity. Assessments of their experiences were used to measure direct learning outcomes and indirect student

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experience. The presentation will provide an overview of the 12 labs that were developed as well as provide an analysis of the importance of lab instructional components to improve student understanding of bioenergy curriculum over lecture classes alone and how active learning can improve student engagement in this agriscience field.

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Comparison of Perceptions of Climate Change among Apsaalooke and Non-Native American Youth

Avery Old Coyote,* Cara Thuringer, Matthew Kennedy and Florence Dunkel
Montana State University

Changes in climate are serious concerns in communities such as Native Americans whose tie to land is both cultural and economic. These place-based changes observed become part of Traditional Ecological Knowledge (TEK) passed from Elders to youth within a tribe. With current coal/oil contracts, the Apsaalooke Tribe will effectively contribute more than 1.5 years of the entire world's production of carbon dioxide. We hypothesized that Apsaalooke youth learned more detailed information at home and/or in school about climate change and carbon footprint than their non-Native counterparts. In Montana State University agricultural sciences course (AGSC 465R) based partly at the Apsaalooke Reservation, one Apsaalooke student conducted a pilot test in a reservation high school. The next semester, he engaged two non-Native AGSC 465R students to serve a 36-question survey to 124 students in two not predominantly Native American Montana schools. Forty-seven percent of freshmen and sophomore survey respondents at MSU-Bozeman rated climate change risk high. Thirty-six 7th and 8th grade respondents in Manhattan, Montana Middle School, a rural, middle school, rated risk high in contrast to results on the Reservation. In this place-based research course, the lead author learned by using the holistic process himself, facts about his reservation's coal reserves that contradicted his tribe's belief system and that could provide direction to changes in the secondary education and higher education curricula. This is an example of how an agricultural research core course using the holistic process provides place-based learning and leadership opportunities for Native American students.

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The Multicultural Advocates in Nutritional Needs and Agriculture (MANNA) Program: An Update

Margarita Teran-Garcia, Elvira de Mejia and Jesse Thompson
University of Illinois

The MANNA program aims to increase student recruitment, multicultural diversity, and enhance education, research and outreach programs. We target the shortage of qualified individuals that can integrate the fields of biological, agriculture, and health sciences to fill positions that address consumer preferences for a safe and nutritious food supply. The MANNA program focuses on development of food and agricultural science expertise to address nutritional needs for improved health, food safety and quality. Four students have been supported for the last 3 years and have had two consecutive multidisciplinary experiential learning opportunities during summer sessions. Students are currently enrolled in the Departments of Food Science and Human Nutrition and Chemistry. The overall project goals were to: 1) establish a long-lasting, pipeline for undergraduate training; 2) develop core competencies; and, 3) increase the skills and diversity of the US workforce. Projected activities accomplished include: a) recruitment and retention of gifted Fellows, b) provided curricular and learning experiences with diverse Faculty mentors, private industry and extension on the integration of biological, agriculture, and health sciences, c) foster professional, communication, decision making and leadership skills. Progress of multicultural graduates will be monitored once they incorporate to the work force. The impact of the MANNA program on career paths of sponsored students will be discussed, with focus on lessons learned, student experiences and outcomes (publications and research awards) and expectations for graduate level education. In sum, the positive impact of the MANNA USDA-sponsored program that includes culturally tailored mentorship could be a model for similar initiatives.

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An Examination of the Dialogue and Relevance; Foci on Students; and Thinking and Progression of Successful Instructors in a College of Agriculture

Marcus Hollan,* Stacy K. Vincent* and Larry J. Grabau
University of Kentucky

Associate deans, program directors, or department heads can evaluate faculty for annual merit review according to criteria for teaching (Diamond, 2004). It is the most influential measure of performance used in promotion and tenure decisions at institutions that emphasize teaching effectiveness. Faculty instructors who are recognized for their teaching are performing at highly effective levels in the classroom. This descriptive study sought to determine the occurrences and frequencies of effective modeling among selected college faculty. This study was guided by the Framework for Effective College Teaching model by Maxwell, Vincent, and Ball (2011). The study revealed dialogue and relevance; student focus; and thinking and progression all define the act of effective teaching. Actively teaching faculty members, within a College of Agriculture, who received a perfect score on their annual merit review for teaching were selected (n = 7). Two randomly selected 50-minute classes were videotaped. Each recording was analyzed by five-minute intervals. Within each interval, the authors calculated the occurrences of the three sub-themes within the selected conceptual model, along with time where neither teaching, nor learning was occurring. Findings revealed the three sub-themes are indeed prevalent in faculty observed; the results were not consistent throughout the lesson and tend to be stronger in thinking & progression. Recommendations include: 1. utilize the constructs as a training model for college faculty; and 2. in a different study, compare the outcomes of these results among first and second year faculty to see if a difference exists.

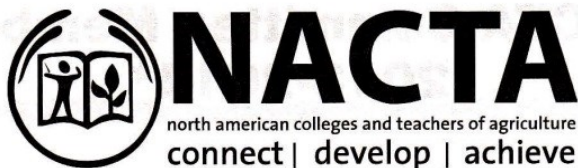
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The Flipped Classroom for Teaching Supervised Agricultural Experience (SAE) an Innovative Tool for Preparing Agricultural Educators

Roger Hanagriff, John Rayfield and Kirk Edney
Texas A&M University

According to AAAE (2011), a research priority is to examine meaningful, engaged learning experiences in ag-

ricultural education. Through SAEs, students apply classroom concepts to real world applications. Agriculture teachers value the concept of SAEs, but often fail to successfully implement SAEs within their programs. A potential solution are resources that better engage students in the SAE planning process, which may involve a new approach to sharing SAE opportunities. A new resource to assist teachers and engage students is an online resource called ExploreSAE (<http://exploresae.com>), which offers flipping the SAE discussion through a self-directed learning process. A common approach for educators is to define SAE opportunities, then hopefully then have students placed themselves into the correct experience. A flipped approach is to provide students with specific situational decisions, and then through inductive reasoning, they are offered an SAE experience that aligns with their responses. Through initial testing, 657 students logged into a test site and completed a pretest regarding their SAE knowledge. Fifty-seven percent of respondents reported not understanding the concept of SAE, but once completing the training this category dropped to 26 percent as students moved to an improved level of understanding. These preliminary results describe the potential value of flipping the SAE discussion and growing the SAE portion of the agricultural education, which offers programmatic and economic benefits.



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