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NACTA Abstracts



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2015 NACTA Abstracts

Table of Contents

Oral Presentations

002	1
Using YouTube to Foster Asynchronous Interaction in an Online Introductory Nutrition Course	
003	1
Factors Motivating Students to Respond to Online Course Evaluations in the College of Agricultural and Life Sciences at the University of Florida	
004	2
A Modern Philosophy of Immersion for Teacher Preparation	
005	2
Is Student-to-Student Interaction in Distance Education Classes on the Minds of Our Students? A Comparison of Undergraduates and Graduate Students	
006	3
Creating High-Quality Videos for Educational Purposes	
007	3
Evaluation of an Agriculture and Food Studies Certificate Program: Lessons Learned and Strategies for Improvement	
010	3
Promoting Novel-Shaped Agricultural Products: An Application of the Mental Models Approach in Developing Message Design Skills	
013	4
Semiotic Analysis of Agriscience Educators and Agricultural Teacher Candidates' Perceptions of Global Competency Gains during an Immersion Experience	
014	4
Global Learning in Agriculture: A Multilevel Collaboration for Internationalization of Curriculum	
016	5
Utilizing Inquiry Based Instruction to Cultivate Global 21 st Century Skill Sets	
023	5
John Muir: Lessons in Sustainability	
026	5
Connecting Students and Dairy Producers through Experiential Learning Activities	
028	6
Evaluation of Professional Development Resources for Swine Science Distance Education Instructors	
031	6
Utilizing a Hydroponic Food Production Course to Increase Student Awareness and Understanding of Food Security	
040	7
Objectives-driven Soil Science Refresher Course	
041	7
Applied Interdisciplinary Product Development for Sophomore Students	

2015 NACTA Abstracts

043	7
Building Student Capacity for Collaborative Problem Solving	
044	8
Recruitment and Marketing to Millennials for Academic Agricultural Programs	
045	8
Teaching International Extension through Undergraduate Service Learning	
050	9
Do Students Value Learning? Examining Affective Learning Indicators	
054	9
Engaging Secondary Students with Service-Learning through Special Programming in Agricultural Education	
056	9
Teaching Factors on Their Minds.....Influencers of Student Ratings and Participation in the Faculty Course Evaluation Process	
057	10
Amazing Orientation	
059	10
The Effect of High-Impact Practices on Students' Learning Style: A Quasi-Experiment	
064	11
Social Media Activity of Agriculture Extension Graduate Students in India	
066	11
Impacts of Course Delivery Methodology and Duration for a Hands-On Learning Based Approach to Livestock Handling	
067	11
International Agricultural Concepts through the Eyes of School-Based Agriculture Students	
069	12
Learning by Doing – Simulations, Games, Experiments and Exercises for Agricultural Economics	
070	12
Curating Student Ideas through Pinterest Activities	
071	12
Student Motivations to attend Summer Bridge Programs and Impact on Student Intended Major Choice	
077	13
Perceived Barriers and Supportive Factors Influencing Hispanic/Latino Students at Texas State University	
078	13
Mentorship and Servant Leadership: Perceptions of First-semester Students	
080	14
Remotely-Guided Study Abroad	
083	14
Using Media Clips to Enhance Teaching Methods and Student Learning	
084	14
An Examination of Agritourism in Action: Teachers' Perspectives of an On-farm Experience	

2015 NACTA Abstracts

087	15
Learning Styles of College Instructors Compared with Their Students	
088	15
Undergraduate Research Methods Curriculum: An Examination of Student Anxiety and Confidence towards Research	
089	16
Emergency Activity Handbook: An Innovative Resource for Creative Teaching	
090	16
Factors Influencing the Communication Skills of College of Agriculture Ambassadors	
091	16
Bridging the Gap for On-campus and Distance Students with Innovative Graduate Student Association Activities	
092	17
Live Animals in the College Classroom: The Difference an Animal Ambassador Makes in Enhancing Student Communication Skills	
093	17
The Impact of a Multi-institution Case Study Course on Entomology Students' Argumentation Skills related to Integrated Pest Management Decisions	
094	18
Billion Oyster Project – Education through Ecosystem Restoration	
097	18
Perceptions of School Based Agricultural Education Teachers Attitudes and Beliefs toward Globalizing the Agricultural Curriculum	
098	18
Be Our Guest: Put Our Students to the Test	
099	19
Hosting an In-Class "Rural Café:" Employing Agricultural Speed Dating to Build Ag Fluency	
100	19
The Value of a Prerequisite	
101	19
Science Outreach Findings and Best Practices	
102	20
Graduate Extension Scholars Program: Strengthening Cooperative Linkages between Land-Grant Universities, School-based Agricultural Education, and 4-H Youth Development	
105	20
Supporting Faculty and Staff Engagement with PK-12 Audiences through a Workshop Series	
107	21
Relationship between Graduate Student Status and Quality of Graduate Education	
109	21
Predictors of Graduate Program Satisfaction: An Empirical Study	
110	21
Utilizing Competing Narratives to Increase Critical Thinking Abilities	

2015 NACTA Abstracts

115	22
Development of a Lean Hog Futures Trading Game to Enhance Student Engagement and Learning	
116	22
Case Study Analysis: An Innovative Pedagogical Strategy that Facilitates Student Learning through Engagement in "Real Life" Community Food Systems Work	
117	23
Enriching Student Engagement through Critical Reflexive Analysis	
118	23
Short-Term Study Abroad Programs: What is on Undergraduates' Minds?	
120	23
Teaching on My Mind: A Reflective Lesson Plan Template	
124	24
Cognitive Learning: Hands-On vs. Theoretical	
127	24
Experiential Learning for a Combat Deployment	
132	24
Does the Quantity of Agricultural Mechanics Training Received at the Secondary Level Impact Teacher Perceived Importance of Agricultural Mechanics Skills?	
133	25
Translating Classroom Learning to the Real World: An Assessment of Agricultural Communications Capstone Students' Career Readiness as Part of Curricular Renovation Efforts	
136	25
The Use of Current Events to Enhance Student Learning in Agricultural Genetics	
142	26
Recent Graduate and Undergraduate Enrollment Trends in American Soil Science Programs	
146	26
Experiential Learning: Taking Knowledge From on Our Minds and Putting it into Student's Hands	
147	27
Creating Active Learning Environments Which Evoke Change Through Development of Agvocacy and Leadership Skills	
149	27
Exploring Institutional Dimensions of PK-12 Engagement of Agriculture Faculty and Staff	
152	27
Learning Gains and Teaching Strategies for a 21 st Century Education in Animal Sciences: Result of a National Survey	
159	28
Distinct Viewpoints of Change as a Result of Study Abroad	
163	28
Communication and Subject Preference among Freshmen in a College of Agriculture	

2015 NACTA Abstracts

166	29
Who Fills the Seat: The Demographics, Perceptions, and Knowledge Base of Students Enrolled in the Introduction to Animal Science Course at Oklahoma State University	
167	29
Student Delivery and Discovery Skills and Performance in Animal Science Courses	
169	29
Perceptions of Internships in an Agricultural Associate Degree Program	
170	30
Integrating Polarized Perspectives to Challenge Graduate Student Opinions	
172	30
Cognitive Tasks Required in Undergraduate Courses: A Comparison of Agriculture and Non-Agriculture Students	
173	31
Agricultural Media Writing Students' Self-Perceptions of their Writing Abilities	
175	31
Relationship between Academic Engagement and Student Satisfaction	
176	31
Student Perceptions of Flipping an Agricultural Teaching Methods Course	
178	32
Creating an On-Campus, Multidisciplinary, Experiential Learning Ecosystem for Student Interns to Solve Engineering and Business Problems for Companies	
179	32
Common Core Kids Go to College: "Readiness" or Not? Here They Come	
181	33
More Than a Number: Efficient and Effective Academic Advising	
185	33
Student-Centered Active Learning Environment with Upside-down Pedagogies: Student Performance and Course Evaluations in a Flipped Biology Classroom	
191	33
Factors Affecting the Success in College of Latino International Students	
194	34
How Faculty Engage in Scholarship of Teaching and Learning	
198	34
SAFE: A Program Development Initiative to Address Sustainable Agriculture and Food Environment Opportunities	
199	35
Evaluation of Multiple Sections of a Single Animal Science Course for Consistency of Instruction Quality	
202	35
Epistemological and Pedagogical Beliefs of Award-Winning Post-Secondary Agriculture Faculty at Two Agricultural Universities	
203	35
Cross Pollination of Undergraduate Instruction to Promote Global Learning	

2015 NACTA Abstracts

205		36
	Using Simple Technology to Engage Student Learning in Large Enrollment Courses	
207		36
	Cultivating Personal and Professional Development: The Benefits of a Student Designed Agricultural Industry Tour	
211		36
	Developing Robust Mentoring Relationships in a College of Agricultural Sciences Leadership Development Program	
212		37
	Technology Use in Post-Secondary Agricultural Sciences Classrooms: What Does the Research Say about Instructor Implementation of Educational Technologies?	
213		37
	Effective Teaching on My Mind: How Do Peer Evaluations Contribute to the Assessment of Faculty Teaching?	
214		38
	An Experiential Learning Approach in Food Science: Improving Students' Critical Thinking Skills	
215		38
	The Campus Kitchens Project: Unique Opportunities for Colleges of Agriculture to Engage Students in Meaningful Community Outreach Efforts to Fight Hunger	
216		38
	Using Jing™ to Improve Engagement in Online Courses	
219		39
	Examining the African-American Perception of Agriculture: Views of Students Attending an 1862 Land-Grant Institution	
220		39
	Flipping an Undergraduate Capstone Course: Student Perceptions of their Experience in a TBL Formatted Course	
221		40
	Integrating Team-Based Learning in an Undergraduate Capstone Course: Advice from Larry Michaelsen	
222		40
	New Program Development on My Mind: Creating an Agricultural Science Major from Scratch	
224		40
	Experiential Learning through Student Farming at Five Colleges and Universities	
225		41
	Describing Students in a Team-Based Learning Context	
227		41
	Have Student Knowledge Levels Changed? A Decade of Pretest and Posttest Comparisons across Agricultural Economics Courses in a Small State University Program of Agriculture	
228		42
	Comparing Senior Agriculture and Non-Agriculture Student Valuation of Communication and Critical Thinking Experiences	

2015 NACTA Abstracts

230	42
Comparing Traditional and Flipped Approaches to Teaching: The Case of the Reflections on Fighting Hunger Course	
231	42
Effectiveness of a Post-exam as a Learning Aid	
238	43
Realized Student Learning Outcomes in an Experientially-based Management and Marketing Course	
241	43
Is a Traditional Drawing Exercise for Plant and Seed Identification Still Effective for Millennial Students?	
243	44
Factors Associated with Pursuing Nutrition Careers and Increased Knowledge in Diverse Students	
244	44
Encouraging Learning and Leadership through Service Learning Projects	
245	44
Relevant, Real World Learning in Agricultural Marketing and Sales Course: Employing Experiential Learning Theory in Innovative Curriculum Re-design and Delivery	
246	45
Using Aerial Drones to Increase Student Participation in an Agricultural Video Production Course	
249	45
Making Agriculture Relevant: Categorizing Texas Consumers' Food-Related Knowledge, Attitudes, and Behavior	
253	46
Video Ethnography: An Approach to Collecting, Archiving, and Sharing Data and Results	
257	46
Linking Leadership Development to Successful Community Engagement in the Tropics	
260	46
Impact of Learner-Centered Syllabus Design on Comprehension and Retention of Course Information	
261	47
Learning through Story: Using Narrative Inquiry in a Graduate-Level Food Security Course	
264	47
Place-based Research as a Tool to Achieve Science Literacy into the Classroom	
269	48
GoFarm Hawaii: Developing an Online Curriculum to Train Beginning Farmers Statewide	
272	48
Graduating Seniors' Perceptions of College and Departmental Services	
276	48
Bringing it All Together: Examining the Role of Capstone Courses in Cross-Disciplinary Academic Programs	

2015 NACTA Abstracts

277		49
	Service-Learning to Promote Edible Insects	
279		49
	Effectiveness of an Experiential Agriculture Program with At-Risk Hawaiian Teens	
 Poster Presentations		
008		50
	Publishing Graduate Class Projects: Advantages and Potential Pitfalls	
009		50
	Listicles: A Different Platform for the “Term Paper”	
011		50
	Assessing Agricultural Student Understanding of Entrepreneurship Skills: Implications on How to Teach Entrepreneurship	
012		51
	Integrating Solar Photovoltaic Technology into Agricultural Education: Benefits & Implications	
015		51
	International Student Organization: Excellent Partners for Global Learning in Agriculture	
017		52
	Global Teach Ag! Initiative: A Framework for Discipline-specific Global Competency Development	
018		52
	Native Plant: What Does it Mean and Why Does it Matter?	
019		52
	“Flipped Internships:” One Way Arizona Grows a Diverse Agriculture Workforce	
020		53
	Team-Based Learning Outcomes in Agricultural Education: Developing a Survey Instrument to Evaluate Student Individual and Group Learning	
021		53
	Stimulating Interest in Plant Sciences to Intermediate and High School Students of Windward Oahu	
022		54
	Examining E-Extension: Diffusion, Disruption, and Rate of Adoption among Iowa State University Extension and Outreach Professionals	
024		54
	If You Flip It, Will They Come?	
025		54
	An E-learning Feasibility Study: Perceptions of Undergraduate Agricultural Students	
027		55
	Why Students Choose to Dropout from College of Agriculture at Razi University?	
029		55
	Developing Well Rounded Agriculture Students: The Importance of Teaching U.S. Agricultural History	

2015 NACTA Abstracts

030	56
Successful Development of Niche Programs in Agriculture: Administrative and Industry Issues	
032	56
Integrating Containerized Native Perennial Plants into Greenhouse Crop Production Curricula	
033	56
Advancing Your Scholarly Teaching into the Scholarship of Teaching and Learning (SoTL)	
034	57
First Year Experience for Veterinary Science Students: Starting in the Right Direction	
036	57
Advising Perspectives Inventory and Workshop Outcomes	
037	57
Using a Pen Pal Program to Assess Student Learning In Science and Communications	
038	58
UFCTI: Measuring Students' Critical Thinking Styles	
039	58
Delivery and Student Perception of a Flipped Senior-level Soil Science Course	
042	58
Concept Development in an Entry-level Landscape Design Course	
046	59
Service-learning in a Community Nutrition Course: Technology-enhanced Strategies for Assessment of Student Learning	
047	59
Students' Perceptions of Enhancing Teaching-Learning Environment in Agricultural Classrooms	
048	60
From Exposure to Challenging Urban Youth with STEM in Agriculture through the Purdue Agribusiness Science Academy (PASA) Summer Institute	
049	60
Changes in Student Perception of Food Animal Agriculture Following Discussion of Controversial Topics	
051	60
Utilizing Videos to Enhance Student Understanding of Soil Science Calculations	
052	61
Implementation and Assessment of Cross-curricular, Case-based Food Safety Educational Materials for the Secondary Education Community	
053	61
Development of an On-line Game for Post-secondary Food Safety Education	
055	61
The LEADERS Program: Experiential Learning Opportunities for Hispanic Students in Animal Science	
058	62
Using Case Study Reusable Learning Objects (RLOs) to Facilitate Critical Thinking in Food, Agriculture, and Natural Resources	

2015 NACTA Abstracts

060	62
Benefits of the Conservation Reserve Program on Highly Erodible Land	
061	63
The Impact of a Manuscript Critique Program on Horticulture Students' Knowledge and Perceptions toward Scientific Writing	
062	63
Behind the Scenes: Working a Professional Golf Event	
063	63
Self-Perceived Leadership Competencies among Agricultural Sales Students	
065	64
Making Sense and Consensus for Agricultural Training and Education to Cope With Climate Change	
068	64
The Sweet Potato Innovation Challenge	
072	65
Development and Evaluation of the Transdisciplinary Obesity Prevention Research Sciences Program	
073	65
Experiential Learning in Distance Locations	
074	65
Motivating Factors for Student Choice of Major: A Longitudinal Study	
075	66
An Examination of School-based Texas Agriculture Science Teacher Position Announcements for the 2014-2015 Academic School Year: Are Teachers Prepared to meet these Challenges?	
076	66
The Relationship of Quality and Quantity of Agricultural Mechanics Training in Agricultural Post-Secondary Preparation in the State of Iowa	
079	67
Experiential Learning Activities as Tools to Promote Diversity in Food Science and Technology	
081	67
Experiential Learning Using Slow Motion Kinematic Analysis to Enhance Student Learning and Decision Making	
082	67
A Peer to Peer Program for Teaching Family and Small-Scale Commercial Hydroponic Vegetable Production in a Low Cost Insect-Free Greenhouse for Tropical Areas	
085	68
Fitness Conditioning Opportunity Improves Classroom Knowledge and Encourages Personal Fitness	
086	68
An Undergraduate Research Experience: Using Technology to Monitor Japanese Beetles Across New York State	

2015 NACTA Abstracts

095	69
Does Global Mindedness Vary by Academic Major with Agricultural Disciplines?	
096	69
Strategies for Teaching Weed Identification	
108	69
Integrating Native Perennial Plant Concepts into Plant Propagation Curricula	
111	70
Desired Leadership Competencies among Agricultural Sales Professionals: A Delphi Study	
112	70
Development of a Distance Education Program by a Land-grant University Augments the 2-year to 4-year STEM Pipeline and Increases Diversity in STEM	
113	70
Exploring Leadership Development through Community-Based Experiences	
114	71
Career Interests of Agriculture Dual Enrollment Students	
119	71
Short-Term Study Abroad: What Concerns do Undergraduates have about International Travel?	
121	72
Teaching Welding: Actual vs. Virtual Reality	
122	72
Nonlinguistic Representation as a Tool for Enhancing Thinking Skills	
123	72
Anxiety of Welding Lowered through Virtual Reality	
125	73
Utilizing <i>Celly</i> Technology to Encourage Student Completion of Coursework	
126	73
A First Year Research Experience in the Large Undergraduate Classroom	
128	73
Mapping the Membership, Does it Help to Affiliate?	
129	74
Change of Plans: A Twisted Approach to the Traditional Microteaching Model	
130	74
Teaching Applied Physical Science in a Metals and Welding Activity	
131	75
Using Cases in an Online Sustainable Agriculture Course	
134	75
Effect of Colored versus White Paper on Student Exam Performance	
135	75
Millennial Alumni Perceptions of Communications Media Used by the Dale Bumpers College of Agricultural, Food and Life Sciences	
138	76
Student Evaluations of a Problem Based Learning, Large Animal App for iDevices	

2015 NACTA Abstracts

141	76
To What Extent are Hispanic Students Underrepresented in Texas Colleges of Agriculture?	
143	77
Challenges and Opportunities for Underrepresented Agriculture Students in Obtaining USDA Job Training in the STEP UP to USDA Career Success Program	
144	77
Examining Rapport, Student Satisfaction, and Learning Gains in an Undergraduate Research Experience	
145	77
Understanding what is Important to New Students: Goal Setting in an Animal Science Freshmen Orientation Course	
148	78
Using the Flipped Classroom to Develop 21 st Century Employability Skills: Merits, Limitations and Strategies	
150	78
Tours for Empowering Future Professionals	
151	79
Creative and Innovative Nutrition Lesson Plans: Backward Design, Instructional Strategies and Florida Standards	
153	79
The Cooperating Teacher Component: Exploring Effectiveness	
154	80
Change in Student Values after Completing an Academic Community Engagement Course	
155	80
Hispanic Agricultural Education Students' Career and College Plans	
156	80
Needs and Expectations of Stakeholders for an Agricultural Academic Department Website	
157	81
Teaching Best Management Practices to Secondary Agriculture Students	
158	81
Toward a Concentric Model of Change: Completing a Model of Holistic Human Development	
160	82
Enhancing Classroom Learning Through Experiential Collaboration: Development of Farm Credit Fellows	
161	82
Exam Score Determinants in an Undergraduate Agricultural Economics Course	
162	82
How Efficacy and Professional Development Support Affect Integration of Other Subjects in a Formal Agricultural Education Classroom	
164	83
Influential Recruitment Factors for a Midwestern College of Agricultural Sciences	
165	83
Evaluation to Improve College Teaching: Going Beyond the Student Evaluation Instrument	

2015 NACTA Abstracts

168	83
Who Fills the Seat: Student Perception of Current and Contemporary Issues Facing Food and Animal Agriculture	
171	84
Self- efficacy Assessment in a PreVeterinary-track Professional Development Course	
174	84
Investigating Students’ Experiences at a Professional Development Conference	
180	85
Agricultural Policy Influencers’ Preferred Methods of Communication: Helping Educators Prepare Students to Impact Agricultural Policy	
182	85
Utilizing Snapchat to Prepare for Career Development Events	
184	85
Joint Ventures in Agriculture: A Novel Approach to an Agricultural Policy Course	
186	86
Instructors’ Understanding of their Qualities that Support Student Engagement: A Phenomenological Study of an Agriculture Field Course	
187	86
iTeach: Building an Inter-University Veterinary Pathology Community of Learning	
188	87
Breadfruit Plants: Tools for Experimental Teaching and Learning	
189	87
Are Judges Biased During Competitive FFA Events When Using Subjective Criteria?	
190	87
Agricultural Outreach Activities in Western Puerto Rico	
192	88
Student-led Facilitation: A Strategy for Class Engagement and Learning	
193	88
Impact of a Child Safety Seat Checkup Educational Event	
195	88
Relationship between Trainability and Herd Aggression of Horses Utilized in an Undergraduate Equine Behavior Course	
196	89
Orienting the First Year Student: Mapping the Future	
197	89
Student Knowledge of Animal Agriculture and Animal Welfare Topics: One Year Summary	
200	89
Developing Pragmatic Research Consumers through Action Based Research Project in Agricultural Education Teaching Internships	
201	90
Performance of Incoming Freshman Students with Different Ethnicities and Genders	
204	90
Students’ Involvement in Campus Organizations: Attitudes and Perceived Benefits	

2015 NACTA Abstracts

206	91
Didactic and Web-based Animations for Presentation of the Pathogenesis of High Impact Veterinary Diseases	
208	91
Engaged Scholarship: An Environmental Major Encircled in Learning	
209	91
Impact of a Faculty Learning Community on the Development of Distance Education Courses in a College of Agriculture	
210	92
Teaching Beliefs and Teaching Self-Efficacy of Graduate Students Participating in a Teaching Workshop	
217	92
Student and Faculty Perceptions of Implementing Active Learning in College of Agriculture Courses	
218	93
Creative and Innovative Professional Development: An Interdisciplinary Collaboration between Teachers and Nutrition Educators	
223	93
Providing Immediate Feedback for Learners by Utilizing GradeCam	
226	93
Perceptions of Undergraduate Students Regarding Global Hunger	
229	94
Adding an Economics Component to a Precision Agronomic Management Course: Challenges and Benefits	
232	94
Labeled School Gardens Make Great Classrooms	
233	95
Inspiring the Next Generation of Agronomists through New Biofuel Educational Resources	
234	95
Innovative Approach to Promote Higher Level Learning of Complex Scientific Concepts in a Rigorous Nutritional Biochemistry Course	
235	95
An Evaluation of Student Perceptions and Knowledge Regarding Cooperative Extension in the College of Agricultural and Life Sciences (CALs)	
236	96
The Effectiveness of Program Area Committees Related to Extension Program Planning	
237	96
Increasing Student Engagement on a University Teaching Farm through an Experience-rich Management Course	
239	97
Summer Interns as Recipients and Deliverers of Agriculture Related Information	
240	97
Utilizing Social Media and Technology in the Classroom: Innovative or Irritating?	

2015 NACTA Abstracts

247	Mentoring About Climate Change: A Two-Way Street	97
248	The Odyssey of Creating a New Study Abroad Program	98
250	Bridges of Madison County: Motivations and Barriers of Appalachian Students to Pursue Higher Education	98
251	A Comparison of Knowledge Gained through Multidisciplinary Teaching on Food Security	98
254	Analysis of Student Engagement by Academic Major	99
255	A Systems Approach to Fostering a Collaborative Experience for Teaching Research: A Case Study	99
256	Analyzing Agricultural Leadership Programs across the United States: Trends in Majors, Minors, Options, Graduate Programs, Certifications and Courses	100
258	Protecting Water Quality – Spreading the Message	100
259	Using the new <i>Illustrated Guide to Soil Taxonomy</i> in Undergraduate Soil Courses	100
262	100,000 Strong in the Americas- Private – Public Partnerships Engagement for Study Abroad in Costa Rica	101
265	Novel Approaches to Teach Histology to Undergraduates in the Reproductive Sciences	101
266	Undergraduate Research Best Practice: Understanding Success through Contextualization	101
268	“Santorio Santorio, We Hardly Knew You:” Strategies for Improving Carbon Cycle Literacy	102
270	The Effect of Supplemental Instruction on Student Performance and Metacognitive Skill Development in a First Year Chemistry Course Sequence	102
271	Optimizing Recruitment Strategies for Food Safety Careers Using the Social Cognitive Career Theory	103
273	Impact of Major Program Events on Instructor Self Perception	103
274	Establishing a Professional Science Master’s Program to Develop Future Biotechnology Workforce with Business Skills	103
275	Determining Essential Components of a College-level Bioenergy Curriculum Using the Delphi Technique	104

2015 NACTA Abstracts

280.....**104**
Strengthening Families through Sustainable Agriculture

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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2015 NACTA Abstract Oral Presentations

002

Using YouTube to Foster Asynchronous Interaction in an Online Introductory Nutrition Course

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Introduction: Online courses offer a flexible and adaptive delivery mode for nutrition education. Interaction is a key component of fostering learning, and use of social networking has been shown to improve the learning experience by enabling interaction. There is limited research on the use of *YouTube* to foster interaction in the online introductory nutrition course (OINC). The objective of this study was to examine the use of *YouTube* to foster asynchronous interaction among students enrolled in an OINC. Scope of Study: The OINC offered through the University of Hawai'i at Mānoa was asynchronously delivered in fall 2014, and students (n=71) completed weekly modules independently. To foster interaction, students were required to upload a 2 to 5-minute video on a cultural food to the course *YouTube* channel. Components included image, preparation, cultural significance, and nutritional information. Students posted constructive comments (5 minimum) on their peers' videos and voted for the top 3. Students completed a survey on their experience upon submission. Results: A majority of students (65) posted their video, with 54 of those videos having at least one comment (mean = 5). Mean number of views was 37 (range 7 – 271). About half (35) had at least one vote (range 0 - 15). Students indicated that it was fun, promoted creativity, fostered interaction through sharing and commenting, but was also technologically challenging. Conclusions: *YouTube's* sharing and commenting feature made it a useful tool for asynchronous interaction. However, modes of use need to be explored to address technological challenges. (Funding: APLU Innovation in Teaching Award and USDA 2011-68001-30335)

003

Factors Motivating Students to Respond to Online Course Evaluations in the College of Agricultural and Life Sciences at the University of Florida

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University of Florida

Course evaluation response rates in the College of Agricultural and Life Sciences at the University of Florida decreased significantly after data collection changed to an online format. Course evaluations carry enormous gravity, being tied to promotion and tenure as well as overall quality of teaching. Despite the overall drop, some instructors persisted with higher than average response rates, even after the transition to online delivery was complete. Guided by expectancy-value theory, this qualitative study sought to describe factors that motivate students within the College of Agricultural and Life Sciences at the University of Florida to and from completing the online course evaluations. Data were gathered on factors which instructors and students perceived to influence students completing the online course evaluation. Personal interviews were conducted with instructors (N=7) with higher than average response rates for course evaluations and a student focus group (N=17) purposively selected for their diverse perspectives. Data were coded using the constant comparative method. Emergent themes from instructors include: context, the course itself, logistics, and motivation. Themes from students include: what's in it for me, respond if, logistic challenges and confusion, and frustration. Implications for the context set around courses, incentives, logistics and student motivation are explored. Recommendations for research include: conduct an experimental and/or longitudinal study and probe deeper into student motivation. Recommendations for practice include: incorporate methods described into practice, use formative assessment, use frequent reminders, develop incentive structures, anticipate logistical challenges, provide in-class time to complete evaluations, and help students find value in the course evaluation process.

2015 NACTA Abstract Oral Presentations

004

A Modern Philosophy of Immersion for Teacher Preparation

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The Ohio State University

The purpose of this study was to describe the capstone immersion experience component of a Modern Philosophy of Immersion for Teacher Preparation. Objectives were to describe a cultural immersion experience for preservice teachers, assess self-perceptions of preparedness to teach in 21st century agriscience classrooms, and analyze self-reflections of a cultural immersion experience. Ten preservice teachers at a large Midwestern university were immersed in teaching at Metropolitan Nashville Public Schools (MNPS) whose 82,000 students rank it the 42nd largest district America. Students at MNPS represent more than 120 countries and languages. For the purposes of this study, a 21st century curriculum of immersion in agriscience teacher preparation, blends non-traditional context-setting with traditional teaching approaches like problem-solving, and delivery strategies like experiential learning. McDermott wrote that Dewey emphasized learning from an experience rather than learning first and experiencing second. He said Dewey emphasized the importance of reflection, and cautioned against failing to revisit the learning that took place. Therefore, at the completion of the four days of cultural immersion at MNPS, all preservice teachers reflected on their experience using ten pre-established reflection questions. Individual written reflection was followed by facilitated group discussion and written responses. Data were compiled and analyzed using a thematic analysis method. Conclusions were that the unique cultural immersion engaged preservice teachers in 21st century agriscience classrooms, reinforced their cognitive learning, provided a context to apply psychomotor skills, contributed valuable experience before student teaching and prepared them to meet the diverse needs of students.

005

Is Student-to-Student Interaction in Distance Education Classes on the Minds of Our Students? A Comparison of Undergraduates and Graduate Students

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Jane Bachelor
University of Florida

The distance education literature states emphatically that student-to-student interaction is important in distance learning. But this recommendation appears to be based on research with face-to-face classes from four decades ago. Is this recommendation applicable to distance education students today? At the 2014 NACTA conference a paper based on research with graduate students who completed one or more distance education classes in agricultural and extension education from North Carolina State University (NCSU) over a three year period was presented. It was found that these graduate students didn't particularly like or want student-to-student interaction in distance education classes. These findings raised the question as to whether or not undergraduate students would have the same view. This study focused on undergraduate students taking distance education classes at the University of Florida from the Department of Food and Resource Economics. Over 250 students enrolled in "Principles of Agribusiness Management" and "Selling Strategically" were administered the identical instrument used in the NCSU study. These two courses attract a broad spectrum of students including many non-majors. The findings were virtually identical to the NCSU study. The Spearman rank correlation between the UF undergraduate and NCSU graduate student ratings on the 18 items on the instrument was 0.91 and the mean attitude scores of both groups was identical. Having student-to-student interaction in distance education classes is not on the mind of the undergraduate students. If a professor feels strongly that interaction is an important component of a distance education class, making it an optional component would be recommended.

2015 NACTA Abstract Oral Presentations

006

Creating High-Quality Videos for Educational Purposes

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Video is the medium of choice for many people. More than 40% of Internet traffic in 2012 was from video, and by 2016, the share of video Internet traffic is expected to jump to 62%. Research indicates that video is becoming the preferred channel of communication for young adults and is fundamentally changing the way students learn. Research also indicates that because video provides teachers with the ability to bring the “world” into the classroom, students become more engaged and think more critically about what they see and hear. In a recent study, agricultural communications professionals indicated they need more development in video shooting and editing. Few agricultural sciences programs offer a video course; therefore, many agriculture-focused professors – in communications or another agriculture field – do not have video production skills. Creating video-based assignments can be less daunting with a few video production techniques. This presentation describes how video assignments are integrated into agricultural communication courses at the University of Florida and Texas Tech University to help students better grasp science concepts and to transform these complex concepts into simple information. Presenters will provide session attendees with tips on how to shoot and edit video for educational purposes – with the use of both video cameras and mobile devices – how to use video to tell narrative stories, and how to integrate student-created video content into their courses.

007

Evaluation of an Agriculture and Food Studies Certificate Program: Lessons Learned and Strategies for Improvement

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The Agriculture and Food Studies Certificate program at Monroe Community College is the result of a five year effort and partnerships with the Rochester Institute of Technology, regional workforce investment agency one-stops, and the Technical Farm at Cornell’s Agriculture

and Food Technology Park. An objective of the certificate is to develop a skilled workforce for at least 200 local agricultural and food-related employers within the nine county region of Rochester NY. The certificate promotes two career pathways; agriculture and food processing, and is offered as both a two and four semester sequence. The program is structured for students with at least a high school diploma or GED, as well as some post-secondary education and/or work experience that would allow them to enter the career pathway at a later point (not entry-level). Based on focus groups and a census of 202 local employers within the New York State food and agricultural sector, employers described the prerequisite knowledge and skills required of incumbent, underemployed, and displaced workers for vertical advancement within these companies. Fourteen students are currently enrolled, with two recent graduates having been hired by local employers. Implementation and evaluation of the program suggests the need for more effective strategies and methods for targeting potential students, working with employers and trade associations to address perceptions of agriculture and food-related career pathways, and accounting for the lack of academic preparation of potential students, including English and math proficiency or the lack of a high school diploma/GED.

010

Promoting Novel-Shaped Agricultural Products: An Application of the Mental Models Approach in Developing Message Design Skills

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Iowa State University

To develop students’ skills in promoting agricultural products, decision analysts recommend the use of the mental models approach, which suggests that the complex web of facts and general associations about a product—its cost, qualities and other attributes—should be systematically mapped. Those who create marketing messages first consider the structure of lay mental models and then compare them to those of “experts” to identify discrepancies, so that communication strategies can be developed to add value to commodities. This study employed such an approach to hone students’ ability to identify the messages and how to fashion them for maximum persuasive impact. In a sales communication class, the model was applied to assist students in the task of promoting novel-shaped fruits: pears shaped like

2015 NACTA Abstract Oral Presentations

babies and Buddhas. Students were asked to interview an expert panel to answer the question, "What should people know about these products?" and a sample of non-experts to answer the question, "What do people already know about them?" Then, the "mental maps" or network of concepts and ideas generated by experts and lay respondents were compared to answer the question, "What do people still need to know about this unusually shaped fruits?" Students found the approach most useful in formulating message objectives; uncovering consumer insights, attitudes and beliefs about the product; fashioning messages that play up the unique selling points of a product. They found it helpful in teasing out and addressing misconceptions and in identifying what consumers are most likely to get wrong unless emphasized.

013

Semiotic Analysis of Agriscience Educators and Agricultural Teacher Candidates' Perceptions of Global Competency Gains during an Immersion Experience

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The Pennsylvania State University

Andrew Thoron and Kirby Barrick
University of Florida

An ever increasing opportunity exists for students of all study interests to enhance their education with a trip abroad. Mezirow's transformational learning theory which is the "process of exploring, assessing, and working to change limiting frames of reference and habits of mind" served as the theoretical foundation for this study. This study utilized focus groups and semiotic analysis of participant submitted photos to identify themes in knowledge, skills, and dispositions of global competency. The population of the study included 15 individuals, seven preservice candidates and 8 in-service agriscience educators that participated in an experience to the Republic of Korea. Each participant submitted three photographs with descriptors to represent knowledge, skills, and dispositions gained from a month-long immersion experience. A focus group was conducted with the individuals involved in the study to discuss submissions. Researchers identified three themes for knowledge, six themes for skills, and five themes for dispositions from focus group transcriptions and field notes. Knowledge, skills, and dispositions gained included knowledge of the Korean language and education system, further developed skills in collaboration and communication, and enhanced dispositions regarding the acceptance of other

cultures. The study found that four weeks spent immersed in a different culture developed and enhanced self-evaluated global competency, and that immersion experiences have unique value to participants in their personal growth and development. Further research is recommended utilizing semiotic analysis as a method in determining differentiating global competency gains between on campus internalization of curriculum and immersion experiences.

014

Global Learning in Agriculture: A Multilevel Collaboration for Internationalization of Curriculum

Daniel D. Foster and Melanie Miller Foster*
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Kirby Barrick and Andrew Thoron
University of Florida

A global learning in agriculture symposium was conducted in November 2014 with support in part from the APLU Academic Programs Section Innovative Teaching Award Funding. Two core values guided the conference: (1) Purposeful, meaningful global learning can occur on and off campus and (2) Coordination from all levels of agricultural education is needed to ensure maximum student growth on the global competency continuum. Conference included a total of eight instructional hours. There were 56 registered attendees from 10 states representing 17 institutions of learning. Each participant had opportunity to participate in pre-conference programming "Best Practices for Planning Global Experiences in Agriculture", and conference programming "Bringing the World to Your Classroom: Frameworks for Globalizing Your Curriculum" which included the completing of the intercultural development inventory (an individual assessment) prior to arrival and interpretation of results during the conference. Sessions included expert speakers, panels, and roundtable peer review of educational materials. Each conference participant left with one of six different global learning texts and resources. Conference evaluation indicated that all (100%) agreed or strongly agreed with the statement "My overall conference experience was beneficial to my professional growth". In addition, a large majority (88%) agreed or strongly agreed with the statement: "I feel confident in facilitating global learning in my professional setting". Social Media interaction was encouraged and can be viewed on twitter with the hashtag #GLAG14. Future plans include offering an online global learning conference in odd numbered years and a face to face conference in even numbered years.

2015 NACTA Abstract Oral Presentations

016

Utilizing Inquiry Based Instruction to Cultivate Global 21st Century Skill Sets

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The global challenges of the 21st century demand an agile education system that is capable of dynamic reform. Specifically, teacher education is called upon to transform its architecture to meet the evolving needs of diverse learners. Pennsylvania State University Agriculture and Extension Education Teacher Preparation Program developed an inquiry-based global agriculture course to assist future agricultural educators develop global competency necessary of a 21st century change agent. The course aimed to prepare agricultural educators that can lead their future learners in acquisition of knowledge, skills, and dispositions needed for engaging an economy in a globally interdependent and culturally diverse world. The philosophy behind the instruction includes the mastery of 21st century skills such as critical thinking, communication, collaboration and creativity. The course learning objectives included developing the multidimensional construct of global citizenship that entails three interrelated domains: social responsibility, global competence and global civic engagement. The lessons were design to incorporate inquiry-based instructional pedagogy including: (a) tackling real-world questions, issues and controversies, (b) developing questioning, research and communication skills, (c) collaborating within and beyond the classroom, (d) developing deep understanding of content knowledge, and (e) solving problems and creating solutions. Through this inquiry-based approach, teacher candidates demonstrated a high level of intellectual engagement and fostered a deep understanding through the development of a hands-on, minds-on and "research-based disposition" towards learning experiences. Multiple best practices were identified that could be beneficial to practitioners from all disciplines and all types of institutions.

023

John Muir: Lessons in Sustainability

Thomas J. Dormody
New Mexico State University

After hiking the John Muir Trail in California in 2009, the instructor was inspired to develop an interdisciplinary general education course on sustainability tied to primary themes in the life of Muir, the Scottish-American conservationist. The purpose of this presentation is to introduce NACTA members to a creative approach to building deep processing and multidimensional thinking about sustainability among students. To start, the instructor read materials about Muir and other early conservationists, Muir's writings, the authors that inspired Muir, and material on sustainability. After exploring definitions and dimensions of sustainability, the course develops themes that shaped Muir's life and philosophy and makes ties between them to sustainability: His youth, emergence as an inventor and scientist, development of his nature-based faith, experiences in Yosemite and Alaska, development as a nature writer and sketcher, experiences as a farmer, participation in the early US conservation movement, and Spartan approach to exploring the wilds. Fourteen resource people are utilized to strengthen these themes. Assignments include a pencil sketch and accompanying descriptive passage of a nature scene, pre and post sustainability philosophy statements, and a major research project on a theme related to sustainability. The course incorporates a field trip to a nearby national monument and a course summary by John Muir himself (played by the instructor). The course has received an average of 4.83/5.0 on 27 student evaluation of teaching indicators over two classes. Students (n=31) have improved from an 81% to a 91% average on pre and post sustainability philosophy statements.

026

Connecting Students and Dairy Producers through Experiential Learning Activities

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Providing opportunities for students to visit business operations and interact with professionals can enrich their overall educational experience, facilitate communication and critical thinking skills, and encourage the development of career goals. A course was developed aiming to prepare career-ready students with experience in applied dairy business management. Coursework included the assessment of existing dairy operations and provided students with opportunities to apply their knowledge of cattle biology and management practices to real world situations. Students were initially instructed in business analysis techniques, including the use of SWOT analysis, dairy records analysis, industry benchmarking, and

2015 NACTA Abstract Oral Presentations

oral communication. The remainder of the course involved the application of knowledge and skills during four farm visits, culminating in a final project designed to measure student ability to successfully analyze a farm, organize and present pertinent information, and provide recommendations to the producer. In addition to the standard project guidelines, each student was assigned a different aspect of the farm to assess and instructed to generate a business plan for improvement and/or expansion. Students showed marked improvements in communication skills, analytical and critical thinking skills, as well as personal confidence and teamwork. Students rated the course highly and described it as very relevant and necessary for future dairy professionals. Informal class discussions, farm visits, interactions with dairy producers, and in-class case studies were particularly noted as providing valuable real-life experiences. It is hoped that this course can serve as a model for similar agricultural disciplines attempting to integrate hands-on experiential learning experiences.

028

Evaluation of Professional Development Resources for Swine Science Distance Education Instructors

Rebecca Wiers* and Greg Miller
Iowa State University

Professional development resources for educators are very important, especially for distance education instructors. The purpose of this study was to evaluate the professional development tools created for swine science distance education instructors in two programs: Swine Science Online and the Professional Swine Manager Education Program. A questionnaire was created to gather data from instructors (N=18) associated with these programs. Five contacts yielded a response rate of 55.6% (n=10). Instructors were asked to evaluate three professional development tools they had access to: 1. a professional development conference, 2. an instructor resources webpage, and 3. a Webinar. Regarding the conference, instructors reported applying what they had learned and noticing a slightly above average effect. Instructors indicated that the webpage was above average in quality and rated the resources on the page as good or excellent. Instructors ranked the webinar as the most useful of the three tools that were evaluated. Most of the instructors considered the webinar to be valuable and would attend an additional webinar if given the opportunity. The researchers recommend that webinars be given priority over face-to-face conferences in planning future professional development activities and programs.

Webinars offer an efficient and effective means for instructors to interact with each other and find new ideas and techniques for teaching. In the words of one of the survey respondents, "Webinars are typically easier to accommodate in my schedule, and they allow one to ask questions, etc. They are superior to the webpage because they have an interactive component."

031

Utilizing a Hydroponic Food Production Course to Increase Student Awareness and Understanding of Food Security

Christopher Currey* and Ann Marie VanDerZanden
Iowa State University

The increasing interest in regional and local food systems is resulting in an increased interest in hydroponic food crop production. However, the increased interest in food systems also presents an opportunity to discuss the issue of food security as it relates to regional and local communities. Our objectives were to increase student awareness and understanding of food security utilizing lecture content and laboratory experiences in a hydroponic food crop production course. Students completed a 5-question self-assessment on food security at the beginning and end of the course, as well as an 11-question quiz on definitions of terminology and facts related to food security. In the laboratory portion of the course, students were responsible for producing lettuce, cucumbers, and tomatoes in hydroponic production systems. Each week crops were harvested, packaged, and donated to a local perishable food pantry. Student scores on the post-course self-assessment were significantly greater compared to the pre-course self-assessment. Additionally, the percentage of correct answers on post-course quizzes increased by 26% compared to pre-course quizzes, supporting the self-assessment data. Our results indicate that, in addition to teaching horticultural principles and practices, a hydroponic food crop production course can be used as a tool to teach about food security.

040

Objectives-driven Soil Science Refresher Course

Sergio Abit
Oklahoma State University

Oklahoma adopts the cooperative extension model in disseminating agricultural information and technologies to appropriate stakeholders. Because countless crop production-related management decisions are founded upon soil properties and processes, key concepts in soil science are therefore must-haves for Ag Educators. A day-long soil science refresher course designed for Ag Educators was conducted. It was aimed to re-emphasize or reacquaint participants with previously-acquired soil science concepts and skills and update them with key advances. The course was built upon carefully-chosen specific objectives; each of which is in conjunction to a soil science concept or practical skill important to agriculturists. Prior to the start of the course, participants were made to gauge their level of understanding or competence on 17 particular concepts or skills. The three and a half hours in the morning session involved lectures on fundamental principles. Afternoon activities involve hands-on activities or demonstrations on soil texture determination, methods of measuring soil pH, rapid soil nutrient analysis, soil charge and cation exchange, soil water flow, and the effect of residue quality on microbial decomposition. After the course, the participants re-assessed the understanding or competence on the same 17 concepts or skills that they assessed prior to the course. Pre-course assessment indicated that on average, participants can vaguely recall key concepts and skills. They improved to having satisfactory understanding/competence after the course. Most evaluations indicate that the hands-on activities were a vital complement to the lecture.

041

Applied Interdisciplinary Product Development for Sophomore Students

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This research compared the industry readiness, product development skill level, and overall knowledge gains of students taking the Applied Interdisciplinary Product Development (AIPD) course to those who did not take the course (control group). The interdisciplinary team of food

science, human nutrition, and packaging science students at Clemson University applied knowledge from their respective backgrounds in a hands-on setting to create a healthy food product for children, complete with retail packaging. A Subject Knowledge Assessment (SKA) was used to collect data regarding knowledge gained through the AIPD course, and was administered pre- and post-course. Mean difference values (MDV) for each subject area were analyzed using a Paired Sample Satterthwaite t -test ($\alpha=0.05$). SKA results indicated that the MDV were significantly different ($\alpha=0.05$) between the treatment and comparison groups in the overall score and in every subject score area except packaging science. Data from an exit questionnaire was used for evaluation of attitudes pertaining to product development knowledge and skills, department engagement, pedagogy, and industry readiness. The difference between the treatment and comparison groups was analyzed using a two-sided Wilcoxon rank-sum t -test ($\alpha=0.05$). Mean scores between the treatment and comparison groups were significantly different ($\alpha=0.05$) in seven of the nine statements pertaining to product development knowledge and skills, and statements pertaining to pedagogy and engagement. The project was considered a successful intervention for sophomores in the Food, Nutrition and Packaging Science department at Clemson University. A pilot study with a southeastern land grant university is being conducted to test the feasibility of online dissemination of class materials.

043

Building Student Capacity for Collaborative Problem Solving

Matt Spindler*, Curt Friedel and Natalie Cherbaka
Virginia Tech

The escalating rate of global change has created mounting pressure to solve complex societal problems that require robust collaboration across disciplines. The potential benefits of educating and training future agricultural researchers and professionals as effective collaborative problem solvers are manifold and would likely help them to build upon competencies needed to pursue a range of STEM careers. Research demonstrates that cooperative learning pedagogical strategies are an effective means for: a) increasing student engagement; b) improving overall student learning; and c) building the capacity of students to actuate collaboration. The current research study was undertaken to determine the extent to which cooperative learning strategies could be utilized to build students' capacity to collaboratively solve problems. Students in a large course of study were placed

2015 NACTA Abstract Oral Presentations

into cooperative groups based on data obtained by using the Kirton Adaption-Innovation Inventory. The selection process was carried out to ensure that each of the cooperative groups had a fairly even spread of KAI scores. Once the cooperative groups were formed students were introduced to an extensive cooperative learning simulation activity. The findings reveal that the students believed that cooperative learning benefited them and that they were able to learn more from the simulation activity because they had worked together with their collaborators to solve the problems. Observations revealed that very few of the students did not participate fully in the simulation activities and that the students were able to effectively manage the changing problem scenarios within the simulation by utilizing the strengths of their collaborative capacity.

044

Recruitment and Marketing to Millennials for Academic Agricultural Programs

Ricky W. Telg*, Andrea D. Davis and Carly N. Barnes
University of Florida

A lack of agricultural literacy among college students has resulted in challenges when recruiting and marketing agricultural programs to millennials during the college major selection process. A mixed-method study at the University of Florida explored communication preferences of current and prospective students in regards to recruitment, advising, and selection of college majors. The study involved an online survey of 250 current University of Florida Department of Agricultural Education and Communication (AEC) students, as well as in-depth interviews with UF students enrolled in a major outside the department. The online survey of AEC students had 105 responses (42% response rate). Respondents (43%, 99) indicated that when searching for information about college majors the prospective college's website was their first resource. However, only 15% identified the prospective college's website as the most effective resource in helping decide to major in AEC. Respondents identified personal connections as more important resources when deciding on a college major, including current academic advisers/teachers (19%), an alumnus (22%), and a current student majoring in AEC (21%). In addition to utilizing personal connections to recruit new majors, other key findings include developing strong messages capitalizing on relationships and personal attention to best communicate majors, and placing a strong emphasis on career options and degree versatility. The results of this study provide insight into effective marketing and recruitment of millennials into agriculture,

life sciences, and natural resources programs. This research covers traditional and social media marketing (SMM), information gatekeepers, message framing, and key factors influencing college major selection.

045

Teaching International Extension through Undergraduate Service Learning

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We will describe an annual service-learning course in Romania that introduces students to effective Extension programming. Mapping of learning outcomes, experiences, reflection assignments, and assessments of learning will be shared. The course allows students to enhance their application of knowledge while improving economic sustainability of various livestock programs. Students participate in several activities designed for active and engaged learning, including homestays, conducting a livestock exposition, delivering presentations or workshops using appropriate media related to livestock production, physical production facility improvement, and regular completion of reflections to assess both what was learned and how they learned. Reflections along with quantitative data will be shared. 83.3% of the students stated that they were "confident" or "very confident" in their ability to apply social, economic and environmental principles and 88.9% stated that this ability had changed since before this course. 100% of the students stated that their ability to communicate and work with individuals from different countries "improved" or "greatly improved" and 94.5% stated that the experience greatly deepened their understanding of agricultural Extension. 100% stated that the experience broadened their knowledge of a range of cultures and understanding of human values and diverse world views. Over 100 Purdue University and 30 USABTM undergraduate students have participated in this course. Students report significantly improved understanding of Extension programming and the ability to work effectively across cultures through participating in the course. This model has since been extended to additional courses including the Purdue Animal Sciences service learning course with partners in Haiti.

2015 NACTA Abstract Oral Presentations

050

Do Students Value Learning? Examining Affective Learning Indicators

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Collecting evidence of voluntary student behavior is one way teachers determine if students believe that the information that students are learning is worthwhile. Affective indicators such as voluntarily staying after class, reading additional information on their own or applying information learned in class to real life situations are key desired behaviors. The objective of this IRB approved study was to collect affective indicators from 25 students enrolled in an upper level horse production lab on three units taught using a systematic approach to instruction. Units included learning objectives, resources for students to obtain information pertinent to learning objectives, a pretest, an ungraded post-test designed to assess student mastery of each objective and an anonymous satisfaction survey to complete at the end of the lab. For this study, individual units were prepared for each of three horse production labs covering the following subjects: colostrum, IgG and emergency horse care; affective indicators were compiled. The number of students who exhibited positive affective indicators was impressive: 25% for the colostrum lab, 73% for the emergency horse care lab, and 22% for the IgG lab. For example, students voluntarily read and discussed journal articles that were not required for the colostrum and IgG labs, and practiced emergency horse care techniques well after the completion of the scheduled lab period. Results indicated that the knowledge and skills that students gained during the labs were perceived by them as worthwhile. Collecting affective indicators informs the teacher of the degree to which students value their learning.

054

Engaging Secondary Students with Service-Learning through Special Programming in Agricultural Education

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The Pennsylvania State University

In support of a program offered through the college that brings approximately 30 high school juniors to campus for four weeks, a team of eight faculty/staff/undergraduates designed a service-learning program in agriculture. The program focused on the princi-

ples of service-learning, while immersing the students in the fundamentals of silviculture, tree risk analysis/management, and allowed students to gain exposure to community-based instruction. Through this project students engaged in meaningful community-based service-learning, as well as experienced potential teaching opportunities available in agriculture. Additionally, the project served as a model for current AEE students to follow when designing service-learning programming, focusing on distinguishing between true service-learning and community service. Specific objectives of the learning experience included: 1.) Students will learn how arborists/silviculturalists use science, math, and technology to analyze, catalog, and map trees, 2.) Students will experience a complete service-learning project, and 3.) Students will utilize technology to complete the service-learning project. The program occurred over a 4-week timeframe. Students were divided into service learning groups of approximately 10 individuals. The tree inventory team met for 8 hours on four different Fridays. During these meetings, students were oriented to service-learning, developed their understanding of tree identification, tree risk, received instruction on utilizing GPS and iStreet/iTree applications, conducted practice surveys, and conducted an actual tree inventory in a local community for that community's 137 streets. The project benefited the local community, which does not have an arborist on the payroll, and it provided the students exposure to the opportunities in this sector of agriculture.

056

Teaching Factors on Their Minds.....Influencers of Student Ratings and Participation in the Faculty Course Evaluation Process

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Faculty Course Evaluations (FCEs) are a key tool for assessing both teaching methods and course content in the physical or distance classroom. Much of the research looking at factors that influence student evaluations has been conducted in fields other than agriculture. This study analyzed the factors influencing student participation and course ratings of 713 student evaluations in one upper division Agricultural Economics class taught by the same instructor for 10 years at the University of Florida. The course, applicable for multiple majors and minors, has been taught both live and asynchronously online. Since the instructor and the course substance factors have remained constant, this platform provides an opportunity to study the impact of the other variables on course and instructor evaluations and par-

2015 NACTA Abstract Oral Presentations

ticipation in the evaluation process. The purpose of this review was to ascertain factors impacting students' learning, allowing the instructor to emphasize and enhance those that are positive influencers and, where possible, to minimize or eliminate those factors that negatively impact the students' learning experience. The mean scores on two evaluation items, "Overall Rating of the Instructor" and "Overall I Rate This Course As" showed significantly higher response rates for paper versus online evaluations. Additionally, live classes were rated higher on both the instructor and course dimension than asynchronous online classes. The findings of this study are similar to studies conducted in other disciplines outside of agriculture. Administrators need to be aware that differences in instructor and course ratings may be influenced by variables other than the instructor.

057

Amazing Orientation

Kathleen S. Jogan* and Kelly Vowell Johnson
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Universities are concerned with student retention and incorporate focused campus orientation programs to support this goal. Institutions value the benefits of providing students with more than one type of orientation. At the University of Arkansas, an orientation activity modeled after the popular television show "The Amazing Race" was created for 96 undergraduates enrolled in an introductory level animal science lab. In addition to specific services offered at departmental sites, the game incorporated locations of laboratories and break rooms, introductions to key personnel and club advisors, and information about faculty including their areas of research. Students were randomly divided into groups and provided maps with six destinations. As groups arrived at destinations, they were met by personnel who explained services offered. Students were required to gather signatures or complete one-minute projects (crossword puzzles, word games) to document that they visited the destinations. Institutional Review Board approved surveys were administered to participants. Students rated seven statements designed to determine familiarity and knowledge of surroundings, services offered and faculty on a 1-7 Likert scale (1= not at all; 7 = very much). Aggregate scores on the seven statement pre-race survey was 3.2, which indicated that students had little or no knowledge of departmental facility, faculty or services offered. Aggregate post-race survey scores on the same seven statements was 6.1 which indicated that students had vastly improved their knowledge in these areas. Furthermore, students reported they en-

joyed the activities and made new friends as a result of this "amazing orientation."

059

The Effect of High-Impact Practices on Students' Learning Style: A Quasi-Experiment

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This study was conducted as part of a larger study of factors surrounding high-impact experiences in post-secondary agriculture courses. Undergraduate students in four courses during the summer and fall semesters of 2014 were included in this study: Two courses integrating high-impact educational practices served as the treatment group, and two courses with traditional instruction methods served as the control group. Kolb's Learning Style Inventory (KLSI) was used to assess students' learning styles at the beginning and end of each semester. The KLSI measures preference for learning style in four areas: concrete experience, abstract conceptualism, active experimentation, and reflective observation. Using the difference between scores from beginning to end of the semester, change in KLSI score for each dimension was determined for each student. A one-way MANOVA was used to detect differences in the changes of student learning style in the four different areas of the LSI during the course of the semester. Based on the results, there were significant differences (Hotelling's $T^2 = .38$; $F(4, 79) = 7.25$; $p \leq 0.01$; $\eta_p^2 = 0.27$; $1 - \beta = 0.99$) between the treatment group (courses with HIPs) and the control group (traditional courses), indicating an effect of HIPs on student learning style. The greatest differences existed in the construct of reflective observation, which implies a shift away from active experimentation. Therefore, further study is recommended to investigate the effects of the trade-off of shifts between dimensions of learning styles and the implications of the shift on student performance.

2015 NACTA Abstract Oral Presentations

064

Social Media Activity of Agriculture Extension Graduate Students in India

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Virginia Tech

An increasingly important channel of communication, social media has made its presence in every sphere of our life. It has great potential for sharing news, communicating new technologies, and making available products and services. However, several questions have emerged about this new media with respect to agricultural extension education, research, and extension services. The expanding scope and enormity of use of social media, led the researchers sought to identify the activities and the level of their use related to extension education that are being shared in this platform. The objective of this was to determine the types and extent of social media use in relation to students' subject discipline. The study was conducted at four Indian agricultural universities. Information from students on communication techniques and activities related to agricultural extension was collected through a stratified random sampling, and data were analyzed using mean, SD, chi-square and correlations. It was revealed that the students of extension education were engaged in eighteen activities on social media. In addition, the three activities that the majority of Indian extension students performed in social media were creating, strengthening and debating on extension forums (98%), writing blogs related to extension education (74%), and videoconferencing (61%). The evidence shows students of Agricultural extension are engaged in different kinds of social media such as face book, linked in and twitter for social networking in subject related activities.

066

Impacts of Course Delivery Methodology and Duration for a Hands-On Learning Based Approach to Livestock Handling

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Iowa State University

The demographics of undergraduate students enrolling in Animal Science at Iowa State University are diverse. More students are coming from urbanized areas that

affect their experience level working with or handling various livestock species. In order to engage students with livestock that supported the well-being of both student and animal, a hands-on learning course: Animal Science 190X: Animal Handling, Safety, and Well-Being was developed. Through the course, students learn how to handle sheep, swine, poultry, horses, beef- and dairy cattle. Students are assessed through online quizzes, a final written exam and are required to demonstrate handling knowledge and skills learned in a final laboratory practicum assessment. The class has been offered as either an eight-week or an intensive one-week course. The objective of this study was to determine if the course duration affected student material retention and final laboratory practicum grade. Students enrolled in the one-week intensive (n=23) course had greater overall quiz scores ($P<0.02$), final written exam scores ($P<0.03$) and had a higher ($P<0.001$) laboratory practicum grade, compared to students enrolled in the eight-week course (n=22). This resulted in students in the one-week course achieving a higher overall final grade ($P<0.01$) in the course. In conclusion, students who were enrolled in the intensive one-week course demonstrated greater overall retention of material throughout the various components of this course.

067

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

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To compete in a global economy, the United States educational system should focus on internationalizing the curricula. The objective of this study was to identify the attitudes and beliefs of School-Based Agricultural Education (SBAE) students in regards to international agriculture. This descriptive study utilized a questionnaire comprised of 46 items, which measured four constructs and used a five-point likert scale, and demographic questions. All four constructs (attitudes, understanding, attitudes toward instruction, and beliefs) were reliable based on the post hoc reliability analyses. Three SBAE programs were purposively selected to participate in this study based on the size of the school and their rural or suburban location. The summated means of all students for attitudes, beliefs, understanding, and instruction were 3.81, 3.81, 3.76, and 3.76, respectively. Participants hold positive attitudes and beliefs toward international agricul-

2015 NACTA Abstract Oral Presentations

tural concepts. Also, students agreed they needed a basic understanding of US and world geography and were more likely to understand global agriculture if instruction was provided. In an effort to remain a global leader in science and innovation and to meet the needs of the agricultural employers, State Departments of Education should consider providing resources for the development, testing, and implementation of internationalized curricula.

069

Learning by Doing – Simulations, Games, Experiments and Exercises for Agricultural Economics

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“Learning agricultural economics without letting me use my cell phone or my computer – whoa!” Successfully using games, simulations, exercises and experiments in teaching agricultural economics requires a bit of magic, entertainment, business savvy, and luck. Although not technologically innovative, inclusion of these activities complements the lectures and textbook assignments as well as encourages students to make decisions and interact to increase interest and decrease skepticism about economic theory. The “Ah? Ha!” teachable moment is achieved in groups, requiring physical participation to find solutions that can’t be done using smart phones or computers at one’s desk. The instructor creates a competition for learning using team building exercises to reach consensus decisions (“we-we-we”) rather than individual (“me-me-me”) decisions; an auction market that mimics the planning and implementation of a restaurant menu is an example. The teacher must establish a teachable moment, an objective and an expected learning outcome for each activity; rewards (other than grades) are enumerated prior to the event. Emphasis should be on the “why” story (not just theory or facts), creating an emotional connection that leads to discovery. Examples of various activities include door-to-door selling simulations, trading decisions (lemons), market demand and demand elasticities (Snickers Bars), efficient allocations (paper airplanes), diminishing marginal returns (golf balls), game theory (football play calling), and the prisoner’s dilemma. Students acknowledged learning more [4.8 on 5.0 scale], remembering more [4.7], applying more [4.7], and liking the learning experiences more [4.6] as compared to lecture format; also, economics could be fun [4.5 on 5.0 scale].

070

Curating Student Ideas through Pinterest Activities

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During the process of developing an asynchronous online methodology of teaching course, the need for interactive group discussion platforms was brought forward. The current platform used for online discussion through The Ohio State University’s online course management system has several limiting factors, causing the researchers to seek outside discussion platforms for certain learning goals. Researchers set out to identify a discussion platform that would allow all students to see one another’s discussion without needing to open each discussion individually. Ultimately a few ideas were generated but in the end Pinterest was chosen as the discussion platform for the activity, which students conducted twice with two separate content areas. Students (N=11) actively engaged in discussion using Pinterest, by contributing to one another’s knowledge base, referring to what their peers posted, and assisting one another with questions through their posts. In total between the two activities students were asked to provide comments on twenty-one variables, sixteen Principles of Teaching and Learning variables and five Rosenshine and Furst variables. Using the ideas generated from everyone enrolled in the course, students were asked to modify a Unit of Instruction they had loaded during the first week of class to reflect their own thoughts on the variables or they could use their peers ideas. The researchers plan to continue the use of Pinterest for both online distance learning and for activities related to face-to-face courses. Pinterest has many different applications for the classroom, the activity described is just one way students can utilize the site.

071

Student Motivations to attend Summer Bridge Programs and Impact on Student Intended Major Choice

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Abstract: Summer academy experiences provide a transition from high school to university life, familiarity with campus life, academic expectations, and a new commu-

2015 NACTA Abstract Oral Presentations

nity. The objectives of this sequential mixed methods study were (1) examine factors influencing students' participation in the Summer Academy program, (2) examine factors influencing students choice of College of Agriculture and Life Sciences (CALs) tracks, (3) determine if Summer Academy classes impacted choice of intended major. Over the course of two years of data collection, 97 students were asked to participate in a survey and 32 (33%) responses were collected. Data showed family influence was a primary attendance factor for 38% of students, while "getting a head start" was a major factor for 66% of students. The CALs specific classes had an influence on intended major for 52% of participants. Focus group results indicate the summer academy impacted major selections, potentially increasing retention rates within both departments and college. In some cases, students reported courses confirmed their major choice, while others indicated their courses revealed unknown academic interests, causing them to switch majors. This study suggests that early academic experiences may have an influence on future academic choices. Offering students opportunities to begin their academic career early can benefit both the student and the university. For educators and administrators, involvement in a summer bridge program could provide recruitment opportunities as these early courses can possibly influence student's choice of major. Further study is underway to further examine these influencing factors and the long-term impact of the summer academy.

077

Perceived Barriers and Supportive Factors Influencing Hispanic/Latino Students at Texas State University

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According to the 2009 U.S. Census report, Hispanics/Latinos account for 8.1% of the graduation class population (bachelor level degree) in the U.S. Furthermore, Hispanics/Latinos are less likely to take college preparatory curriculum in high school and take advantage of financial aid opportunities. Results of some research suggests the placement tests characterized first-generation Latino college students as underprepared for college. To better understand the perceived barriers and supportive factors facing Hispanic/Latino students in higher education, researchers sought to answer two research questions in this non-experimental,

mixed method study: (1) What are the self-perceived barriers toward higher education as identified by Hispanic/Latino students at Texas State University?; and (2) What are the self-perceived influential factors that improve access to higher education as identified by Hispanic/Latino students at Texas State University? A 37 question electronic survey was developed, reviewed by a panel of experts, pilot tested for reliability, and administered to a sample ($n = 372$) of the total Hispanic/Latino student population at Texas State University in the spring of 2013 ($N = 9,000$). Responses were analyzed using IBM SPSS Statistics 21 for measures of central tendency. Results indicated that personal financial constraints ($M = 2.95$; $SD = 1.29$) was the largest barrier to these students facing higher education and parental support ($M = 4.49$; $SD = 0.98$) was the greatest factor aiding students in their pursuit of higher education. Based upon the results of this study, universities can identify barriers which impede graduation and streamline policies by understanding the supportive factors which improve graduation rates.

078

Mentorship and Servant Leadership: Perceptions of First-semester Students

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The millennial generation is one of the most vulnerable and disconnected generations to enter a college classroom. The use of quality mentorship, both inside and outside of academia, helps students understand the purpose of their education, which influences students' productivity, work ethic, and intrinsic motivation. Investigating mentorship through the lens of servant leadership connects service-oriented and leadership traits to qualities students desire in personal mentors. The study describes 436 first-semester students' perceptions of servant leadership in personal mentors at the beginning and end of the Fall 2014 Freshmen Orientation course in the College of Agricultural Sciences and Natural Resources at Oklahoma State University. Based on the Servant Leadership Survey (SLS) and a researcher-designed mentorship questionnaire, students rated accountability and empowerment as the highest servant leadership traits in their personal mentors. Parents were identified as the most common mentor, and student and peer mentors showed the greatest increase between the beginning and end of the course. Nearly one-third of students changed who they identified as their personal mentors at the beginning and end of the course. The study yielded the following recommendations: Millennial

2015 NACTA Abstract Oral Presentations

students desire mentorship so higher education institutions should (1) be purposeful about organizing and implementing mentorship programs; (2) develop student leadership groups around servant leadership qualities, such as accountability and empowerment; and (3) further investigate the influence of peer mentorship in higher education programs. As the needs of students evolve, the need to understand how students seek and address mentorship in higher education has never been more prevalent.

080

Remotely-Guided Study Abroad

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Technological advances in distance learning, mobile communication, and geo-location make remotely-guided (RG) study abroad increasingly practical and cost effective. We define RG study abroad as packaged international travel having a formal educational purpose where participants and guides are not in the same place. We mention related products and services, but to our knowledge this concept has not been previously described in the literature. RG study and fully-guided (FG) study, as defined, both utilize packaged travel, meaning participants follow a set itinerary with scheduled stops at specific locations and times. FG study uses face-to-face guides who lead participants throughout the entire trip whether participants need support or not. RG study uses the same guides but track, teach, and direct participants remotely, providing additional support as needed. In this way, RG study is hypothesized to reduce per-person travel costs and minimum enrollment requirements compared with FG study. Compared with independent or unguided (UG) study, RG study is likely more expensive. However, we suggest that marginal investments in RG study abroad target five areas where the existing literature says students have the greatest worry (i.e., trip planning, making reservations, responding to emergencies, getting from place to place without getting lost, and avoiding cultural mishaps). Applying a framework of best practices for distance learning and study abroad, we suggest how to select and package technologies for use in a specific RG study abroad program, namely a 12-day trip to Panama with four students visiting 10 ag-tourism sites in five different cities.

083

Using Media Clips to Enhance Teaching Methods and Student Learning

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Films can be used as a teaching tool. For example, an entire film or specific scenes can be viewed during class times or as an out of class assignment; or brief media clips, which demonstrate a specific concept, can be incorporated into a classroom lecture. This presentation will focus on the use of brief media clips. There are many benefits to using media clips as a teaching tool in the classroom. Brief clips can stimulate the learning atmosphere by breaking up long lectures, or as a classroom change of pace at various times throughout the semester. Clips can be replayed, making it possible to clarify or promote further discussion. Clips can be used as an icebreaker, an introduction to a topic, or a starting point for a discussion. Using films in the classroom can create a shared language and increase class discussion. Familiar content and “stars” can provide a common ground. Students can relate to the characters. This engages students and appeals to a wide array of learning styles. While many movies show wrong behavior, they also often show how characters changed their habits or overcame their mistakes. This allows students to focus on fictional mistakes, rather than admitting personal missteps. In this interactive session, we will view and discuss the use of media clips to enhance student learning.

084

An Examination of Agritourism in Action: Teachers' Perspectives of an On-farm Experience

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Agritourism offers agricultural producers a means not only to increase farm income but also to educate the public about agriculture, to support their local community, and to provide opportunities for young people to remain involved in agriculture. Agriculture and tourism are the top two industries in Georgia, and producers across the state have begun to keep the consumer in mind. Jaemor Farms invites elementary schools to participate in their school field trip program, an on-farm experiential

2015 NACTA Abstract Oral Presentations

learning opportunity that is curriculum-based and aligns with the state's performance standards. This study used survey methodology to examine 66 teachers' (first-time and repeat visitors) experiences on the farm. The tour included wagon rides, a farm slide, duck races, and a mini maze as well as interaction with animals (i.e., petting zoo), produce (i.e., apples, pumpkin), insects (i.e., honey bees), and textiles (i.e., cotton). The participants were satisfied with all parts of the tour—over 80% indicating the quality was worth the attendance fee, over 60% indicating curriculum provided prior to the field trip was helpful in the classroom, and over 80% indicating the field trip was grade level appropriate. Furthermore, the results indicated the potential for agritourism to impact public perception. Public farm tours can increase the number of informed consumers and increase their support of agriculture. Results such as these help producers design experiences that engage consumers in food production and help universities prepare graduates to write elementary agricultural curriculum and design basic agricultural field trip programs valuable for both producers and consumers.

087

Learning Styles of College Instructors Compared with Their Students

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Most instructors seem to be aware that students have various learning styles that impact the students' preferences in learning course content. Instructors possess their own learning styles and often teach according to their own preferences. Their teaching may not account for the full range of student preferences, which can lead to a disconnection between how instructors teach and how their students learn. The learning styles of students ($n=454$) and instructors ($n=20$) in the animal sciences department were assessed with a 44-question online Index of Learning Styles (ILS) instrument that included four dimensions (active/reflective, sensing/intuitive, visual/verbal and sequential/global). The ILS is based on a learning style model created by Felder and Soloman (North Carolina State University). Results characterized the learning style preferences of individual students and instructors. Overall, a greater proportion of both instructors and students were found to possess visual over verbal, sensing over intuitive, and global over sequential learning styles. The proportion of students with an active learning style was greater than for instructors, while the proportion of students with a reflective learning style was less than half that of the instructors. There was a three

fold greater proportion of instructors with an intuitive learning style than found in the students. Of those with a sequential style, there was a four fold greater proportion of instructors than students. These results underscore the differences in learning styles between instructors and students, and emphasize the need for instructors to utilize a range of teaching methods and environments to engage all students

088

Undergraduate Research Methods Curriculum: An Examination of Student Anxiety and Confidence towards Research

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University of Florida

Undergraduate research experience engages students in the creation of knowledge, provides career preparation, promotes interest in graduate education, and can help students develop critical thinking, creativity, problem solving, self-confidence, and intellectual independence. It is as critical to prepare students to both expect and tackle the real-world challenges of the research process. The purpose of this pilot study was to examine student anxiety and confidence towards research in an undergraduate research methods course. Students ($N=47$) completed a pretest the first week of class and posttest the last week of class during the fall 2014 semester using Qualtrics. Preliminary findings from paired-samples t tests indicate statistically significant differences in the mean values for the following areas: student's perception of the usefulness of the research course increased ($p<.05$), fear of research decreased ($p<.05$), nervousness regarding understanding and planning research decreased ($p<.05$). Findings also indicate statistically significant ($p<.001$) increases in the mean values for student confidence in the following areas: ability to understand and evaluate research articles, complete a comprehensive literature review, correctly use APA, effectively carry out a research project, formulate a clear research question and testable hypothesis, select an appropriate research design, design and implement an appropriate sampling strategy, design and implement an data collection strategy, design and implement an appropriate data analysis strategy, and effectively present study findings and implications ($p<.001$). By better understanding students' anxiety and confidence towards research, teachers will be able to better help students learn.

089

Emergency Activity Handbook: An Innovative Resource for Creative Teaching

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Time is ticking until class starts and you need a quick, easy to implement idea that you can use for starting the lesson in an engaging way. Does this sound familiar? Or, your students are working in groups, but you need an idea to review the lesson and check for understanding. You could Google to find an activity, but that gives you more than a million results. What if there was a place to find peer-nominated and approved ideas? What if you had a pre-approved list of choices from which to quickly consult? That is the idea behind combining the innovative use of NAAE's Communities of Practice (CoP) site and the creation of an "emergency activity handbook" to be placed right on the teacher's desk. Students in AED 553 at Oregon State University find and share ideas for lesson introductions and conclusions and even sites that offer quality content for use in lesson planning. These ideas are shared to the private CoP site using a template indicating the subject (if the activity is subject specific), materials and instructions for implementing. Students then review the submissions and compile their own quick file for their use in a "teaching emergency". The idea has been implemented for two years and, to date: 128 lesson opener ideas, 83 ideas for lesson reviews, and 137 ideas for quality Oregon-aligned content have been shared. Samples will be shared and the use of the site will be demonstrated.

090

Factors Influencing the Communication Skills of College of Agriculture Ambassadors

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College Ambassadors are often the first individuals potential students interact with when visiting campus and typically have strong communication skills. The purpose of this study was to examine factors which influenced College of Agriculture Ambassadors in their attainment of communication skills, allowing for more purposeful incorporation of these factors into college courses. The objectives were to (1) describe past and current Ambassador experiences which contributed to their communication skills and (2) share recommendations for

strengthening communication skills in other students. All fifteen College of Agriculture Ambassadors on the University of Georgia, Athens campus were involved in one of two focus groups. Students in their first year as an Ambassador participated in focus group one and students in their second year participated in focus group two. Focus group data were transcribed verbatim and content analysis was used to identify reoccurring themes. First and second year Ambassadors shared similar experiences and recommendations. Common themes shared by Ambassadors involved the importance of learning experiences which promoted student ownership and forced students to step out of their comfort zone with regards to communicating with university and industry professionals. Ambassadors recommended that faculty build assignments which promote student attendance at university functions and provide opportunities for students to serve as leaders in class discussions. Creative learning experiences should be incorporated into college courses which build communication skills while promoting student ownership in assignment requirements.

091

Bridging the Gap for On-campus and Distance Students with Innovative Graduate Student Association Activities

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Graduate Student Associations (GSAs) can provide invaluable professional development and social networking opportunities for students and faculty. However, it can be difficult to provide such opportunities for off-campus students in a distance-delivered graduate program. Graduate students in the Master of Agricultural and Environmental Education program at the University of Georgia are a mix of on-campus and off-campus students. In an effort to engage off-campus students in professional development and social networking experiences available to on-campus students, a GSA was initiated in 2013. The GSA has a student-driven executive committee and meets once each month in person while reaching out to off-campus students using distance education technology. The objectives were to (1) identify specific GSA activities which on-campus and off-campus students believe have enhanced their graduate experience and (2) describe student reactions to the activities and technology interface used to broadcast activities to off-campus students. Conversations with GSA executive committee members and the general membership re-

2015 NACTA Abstract Oral Presentations

vealed that while GSA meetings feature both professional development and social networking activities, the majority of students perceived social networking activities to be most beneficial. Specifically, informal, less structured activities involving conversations and storytelling among on-campus and off-campus students using the distance education technology and students meeting at a geographically convenient location to visit a local attraction (e.g., state park or zoo) were most beneficial. Students responded positively to faculty involvement—particularly when faculty included their own family in the activities. Technology was not a barrier for student engagement, but was enhanced when web cameras were used.

092

Live Animals in the College Classroom: The Difference an Animal Ambassador Makes in Enhancing Student Communication Skills

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Public speaking is an activity which can garner anxiety in college students and others. When used as a teaching tool, small animals (turtles, snakes, salamanders, and baby chicks) have the potential to reduce communication anxiety in the presenter. However, beyond anecdotal observations, little empirical evidence exists on the influence of using a live animal on a presenter's communication ability. The objectives of this study were to (1) describe the mechanics of an undergraduate course designed to enhance oral communication skills by training students to use live animals when presenting and (2) reveal qualitative findings from student assignments and focus groups on the impact of using live animals during public presentations. "Animals in Education" was designed to be similar to a public speaking course, but allow students to be trained in safely handling, transporting, and teaching with live animals. A culminating event of the semester involved students teaching youth with special needs while using the animals as ambassadors of their educational messages. At the end of the course, student personal reflection assignments were reviewed and used to inform the development of focus group questions. Student assignments and focus group conversations revealed that using the animals in a presentation reduced communication anxiety in the students because they believed the audience was more focused on the animal than on potential errors in their speaking. Students were also emotionally moved by the experience of using animals while teaching youth with disabili-

ties. When used as a teaching tool, animals can enhance the communication abilities of college students.

093

The Impact of a Multi-institution Case Study Course on Entomology Students' Argumentation Skills related to Integrated Pest Management Decisions

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John Obrycki
University of Kentucky

Entomology students' skills related to pest scenario evaluation and decision making in determining appropriate IPM techniques must be built during educational experiences before graduates attempt to utilize IPM in the workplace. In order to improve Entomology students' decision making and argumentation skills related to IPM, a multi-institution course using case studies as learning experiences was created. The impact of the course on students' decision making and argumentation skills related to IPM was assessed through the following objectives: (1) determine the course's impact on students' number and quality of arguments when supporting IPM decisions; and (2) describe students' perceptions regarding the course's influence on their decision making and argumentation skills related to IPM. This course and associated data collection and analysis are currently ongoing and will conclude in April 2015. Open-ended scenarios requiring students to make and support decisions related to IPM practices are being administered before and after the semester-long course. Sadler and Fowler's Argumentation Skills Rubric is being utilized to determine the number and quality of students' arguments related to their decisions. Descriptive statistics will be reported to determine the difference between students' number and quality of arguments before and after the course. A focus group will be conducted at the course's conclusion in order to gather students' perceptions regarding the course's influence on their decision making and argumentation skills related to IPM. Thematic analysis will be used to unearth focus group themes. Recommendations regarding the course's continuation and expansion to other institutions will be made.

2015 NACTA Abstract Oral Presentations

094

Billion Oyster Project – Education through Ecosystem Restoration

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The Billion Oyster Project (BOP) is an ecosystem restoration and public education project aimed at returning one billion live oysters into New York Harbor and in the process engaging thousands of public school students in the restoration of their local waterways. Students reach key benchmarks in both Career and Tech Ed and general academic classes through an innovative curriculum that requires hands-on participating in the project. They build skills in relevant Marine Careers through career training programs. These programs, Professional Diving, Aquaculture, Vessel Operations, Marine Systems Technology, Ocean Engineering and Marine Biology Research happen to represent the fields required for large-scale ecosystem restoration in marine environments. Students in each program work together to grow oysters and construct innovative reef infrastructure that is installed underwater by student scuba divers from vessels navigated and maintained by teenagers. Students in the aquaculture program learn to support algae and bivalves at commercial scale in an extremely challenging environment. The three year program is designed around BOP and teaches students the theory and business of shellfish aquaculture as they prepare for careers in the rapidly expanding shellfish aquaculture industry. Students' commitment to the work is evident in their academic successes, the thousands of volunteer hours logged before school, after school and on weekends. To date students have conducted thousands of construction and monitoring dives in New York Harbor, restored over 11 million oysters and become the leaders in the in-water restoration movement in New York City.

097

Perceptions of School Based Agricultural Education Teachers Attitudes and Beliefs toward Globalizing the Agricultural Curriculum

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The agriculture industry is part of an interconnected world that is continually navigating complex trade regulations and cultural barriers. Graduates of School Based Agricultural Education programs need to be prepared to positively communicate with people from around the

world and to have an understanding of international agricultural practices. The purpose of this study was to explore the perceptions of Tennessee School Based Agricultural Educators towards globalizing the secondary agricultural curriculum. Twenty six School Based Agricultural Educators were interviewed for this study. The interviewees represented the entire state of Tennessee, including both urban and rural programs. The use of thematic analysis allowed the following five themes to emerge: (a) heightened awareness of living in a globalized world, (b) vision for a globalized school based agricultural education program, (c) benefits of exposure to a globalized school based agricultural education program, (d) preparedness to teach from a globalized perspective, and (e) professional development needs. Participants recognized the importance of teaching through a globalized agricultural curriculum and the benefits that students received from experiencing a globalized agricultural curriculum. However not every participant felt prepared to teach using a globalized curriculum. Workshops should be developed and implemented to aid agriculture teachers in successfully using appropriate pedagogical practices for teaching international agricultural issues. Additionally, the development of a globalized curriculum and international study abroad program for School Based Agricultural Educators would help produce globally competent teachers that are prepared to educate students in ways that help prepare them to work and live in a global society.

098

Be Our Guest: Put Our Students to the Test

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Soft skills, especially communications skills, are desirable to employers hiring college graduates. Service-learning projects in collegiate classrooms can provide educators a vehicle to integrate these skills into the curriculum. Agricultural communications students at Texas Tech University must take Professional Development in Agricultural Communications. Students plan and execute an event within one semester for an organization with a need for a professionally planned event. Events have included professional development workshops for practitioners, an end-of-the year student showcase, agricultural issues forums, department alumni reunion, and several banquets. As a team, students draft budgets, manage registration, book venues, create advertising, and work with multiple vendors to ensure the success of the events. Once the event is over, students write a reflective summary, stating what they learned. The stu-

2015 NACTA Abstract Oral Presentations

dent-led events have occurred for three semesters. In 2014, 150 people attended the Agricultural Issues Forum; approximately 75 alumni attended the reunion; and 25 professionals have attended workshops. Student reflection comments indicated they believe the activity is beneficial to their education. "Planning and executing this event will be very beneficial to all of our futures because of the obstacles we encountered." Texas Tech University plans to continue teaching the professional development course. Students will continue to be involved in all aspects of planning and hosting events. Increased attendance and participation at all events is a goal for future semesters. Events have been funded through donations, registration fees, student organizations, federal grants, and various departmental resources. Resources required include venues, catering, promotional and advertising materials, decorations, and educational material.

099

Hosting an In-Class "Rural Café:" Employing Agricultural Speed Dating to Build Ag Fluency

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A lack of agricultural fluency can be a constraint to students entering agricultural programs of study or agricultural employment. With a decreased rural population, fewer students are entering post-secondary with an agricultural background. In recognition that urban, non-farm rural and international students might benefit from exposure to primary ag producers, a "Rural Café" was carried out in an introductory Animal Science Class in the winter of 2014. The objectives were to build agricultural fluency, learn about "what makes or breaks your farm?" and to enhance communication skills. A total of 78 students and 19 producers representing beef, dairy, swine, sheep, dairy goats, bison, turkeys, table egg layers, broilers and hatching eggs participated in one of three 3-hour café events. Groups of 4 to 6 students spent 20 minutes with six different producers each afternoon. A different student from each group was the team lead for each producer. After the three sessions, new groups were formed made up of those who were the team lead for each producer. These students prepared a presentation highlighting the science points behind one factor the producer brought up as affecting their success. Some students commented that it was their first time speaking with a farmer. Other students with background in a single agricultural commodity indicated that the event broadened their appreciation of different areas. The Rural Café

model may serve other applied disciplines as a means to bring students and industry people together.

100

The Value of a Prerequisite

Cheryl Wachenheim and Paul Fisk
North Dakota State University

Course prerequisites are defined for student success. Calculus is often a prerequisite for intermediate microeconomics. At our university, students simply need to pass calculus. We have been considering amplification of the current prerequisite to require a grade of C or higher and compared success between students passing the class with a D and those passing with a grade of C or higher. Between 2009 and 2014, there were 290 qualifying students majoring in our programs who enrolled in ECON 341 (Intermediate Microeconomics). Of them, 176 (61%) had earned a "C" or higher in ECON 341. Of those 176, 156 (89%) earned a "C" or higher in their most recent prior or concurrent MATH 146 attempt. The association between performance in these courses was significant at $\alpha < 0.01$ ($X^2 = 8.74$, $p = 0.0031$) and a positive correlation ($r = 0.17$, $p = 0.003$) was identified. These outcomes suggest an increased likelihood of success in ECON 341 given a successful grade in MATH 146. A significant association was found between MATH 146 and ECON 341 grade outcomes among male students ($X^2 = 5.61$, $p = 0.0178$) and there was a positive correlation ($r = 0.16$, $p = 0.0178$). The finding of no statistical association for female students can be attributed to their low numbers (58) and other factors. The statistical association identified between success in a prerequisite calculus class and intermediate microeconomics supports amplification of the prerequisite.

101

Science Outreach Findings and Best Practices

Ayla Wilk, Matt Spindler and Hannah Scherer
Virginia Tech

External funding opportunities are often associated with "broader impact" activities aimed at improving public scientific literacy and helping to build the future scientific workforce. Science outreach has shown measurable success in improving formal and informal educational programs by enhancing teachers' understanding of science content and process as well as their confidence in utilizing inquiry-based teaching strategies. In addition,

2015 NACTA Abstract Oral Presentations

students participating in science outreach programs show gains in scientific understanding and interest in science. The potential benefits of employing agricultural science outreach to support the development of future agricultural professionals are manifold. Increased outreach by agricultural science professionals has the potential to assist students in building the competencies needed to pursue a range of careers in agricultural sciences. However, engaging in high quality science outreach often requires professionals to cross complex social and institutional boundaries. An exhaustive literature review has revealed concepts that are critical for successful science outreach. Science outreach best practices include: a) professional development focusing on strategic planning, time management, relationship building, and the appreciation of alternative viewpoints; b) the employment of resource professionals to navigate the boundaries between K-12 schools and research institutions; and c) the expansion of opportunities to build outreach activities into graduate student training, assisting in expanding a culture of scientific outreach. A conceptual model will be presented to guide future research and practice in agricultural science outreach.

102

Graduate Extension Scholars Program: Strengthening Cooperative Linkages between Land-Grant Universities, School-based Agricultural Education, and 4-H Youth Development

Hannah H. Scherer*, Ayla A. Wilk and Matthew Spindler
Virginia Tech

4-H youth development agents and secondary agriculture teachers are highly skilled at developing engaging educational activities for youth, but lack access to emerging research in agriculture and life sciences conducted at land-grant institutions. Additionally, these two groups of educators have limited opportunities for collaboration on curricular efforts, which has the potential to be mutually beneficial by providing resources that can be used by educators in either setting, thus maximizing the impact of outreach efforts. Furthermore, graduate students in life sciences disciplines in colleges of agriculture have a sophisticated understanding of cutting-edge research in their disciplines, but lack training on communicating it to educators and youth. The new Graduate Extension Scholars program in the College of Agriculture and Life Sciences (CALs) at Virginia Tech represents an innovative, collaborative approach to graduate education that addresses these issues and integrates and enhances current efforts by Virginia FFA and 4-H organizations. Program components are 1) planning team of faculty

with 4-H, FFA, research, and extension experience, 2) a new graduate seminar, 3) curriculum teams (graduate student, secondary agriculture teacher, and 4-H agent) centered in a specific county, and 4) dissemination of new educational materials to educators across the commonwealth. Successes from the pilot program year include: four curriculum teams developing materials based on student-centered teaching models, new and strengthened partnerships between FFA and 4-H educators, new connections between Virginia Tech and educators in the field, and increased graduate student understanding of how to work with stakeholders to develop quality outreach programs.

105

Supporting Faculty and Staff Engagement with PK-12 Audiences through a Workshop Series

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University faculty, staff, and graduate students who participate in professional development and develop pedagogical knowledge and skills are more likely to engage with PK-12 audiences. As such, the PK-12 Council and Office of Academic Programs collaborated to develop and deliver four workshops in the 2014-15 academic year to provide support for those in Purdue University's College of Agriculture who are interested in PK-12 engagement. Topics covered included: aligning lessons with learning standards, fine-tuning lesson plans, assessing impacts of engagement activities, and creating posters to share engagement outcomes. A total of 23 individuals from nine of the 11 academic departments in the College participated, including 6 faculty, 9 staff, 6 graduate students, and 2 visiting scholars. A workshop evaluation was completed by participants using a 5-point scale: 1 = none; 2 = a little; 3 = somewhat; 4 = a lot; and 5 = absolutely. Results indicated that the workshops provided participants with a "a lot" and "absolutely" better understanding of how to align PK-12 lessons with learning standards (100%); a better understanding of how to use backward design to organize content (100%); ways to improve their PK-12 activities (100%); a better understanding of the necessary components of a lesson plan (100%); how to adjust activities to be appropriate for different grade levels (100%); how to assess the impact of engagement activities (43%); and, how to create posters to share outcomes of activities (100%). Faculty, staff and graduate students recommended future workshops continue, especially on the topic of assessing impact.

107

Relationship between Graduate Student Status and Quality of Graduate Education

Roshan Nayak, Rama Radhakrishna and Gary Thompson
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Assessment of quality of graduate education and student experiences are crucial for graduate schools to maintain educational standard and reputation. The College of Agricultural Sciences at the Pennsylvania State University conducted an online survey in 2013 academic year with a purpose to enhance graduate education. Surveys were administered to all enrolled graduate students (N=480) and 275 responded for a response rate of 57.3%. This paper presents the assessment of quality of graduate education by full-time (n=174) and part-time (n=42) graduate students based on four factors: 1) students' learning ability, 2) collegiality in departments, 3) student support, and 4) program satisfaction. Multiple Likert type items measuring the four factors were validated by factor analysis and scales were tested for reliability. Summated scores were calculated for all the four factors and independent sample t-tests were performed to examine the difference in responses of full-time and part-time students. Results indicated no significant differences in full-time and part-time graduate students' learning ability and reported collegiality in their respective departments. However, full-time and part-time students significantly differed in their responses relative to graduate student support ($p < .05$) and overall satisfaction with their graduate programs ($p < .10$). Part-time students reported less adequacy of student support related to faculty advising, faculty mentoring, and satisfaction with the graduate programs than full-time students. Findings suggest that improving student support to part-time students may increase level of satisfaction with graduate programs.

109

Predictors of Graduate Program Satisfaction: An Empirical Study

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Graduate programs are assessed for quality, adequacy of student support, and satisfaction. The purpose of this study was to identify factors that predict graduate student program satisfaction. The data for this study came from the College of Agricultural Sciences at the Pennsyl-

vania State University. The target population included all graduate students (N=480) who responded to an on-line survey that included questions on student learning ability (14 items), collegiality (8 items), student support (5 items), student satisfaction (2 items), and program enrollment information. All the items were measured on a five point Likert-scale. The instrument was reviewed by a panel of experts for content and face validity. A total of 275 students responded for a response rate of 57.3%. Respondents indicated that: 1) they performed their tasks at a moderate to high level, 2) their respective programs promoted a positive environment for learning, and 3) they received adequate support from their respective programs. Step wise binary regression analysis revealed that all the four factors (learning ability, collegiality, course, and faculty advising support) were highly correlated with their program satisfaction and explained 28.7% of the variance. Findings of this study are aligned with literature that supports educational quality and student support as predictors of student satisfaction. Colleges and universities should address retention related educational quality aspects and prioritize student support with courses and curriculum. Further research is needed to study factors influencing student satisfaction and to examine the relationship between academic and psychological factors and student satisfaction.

110

Utilizing Competing Narratives to Increase Critical Thinking Abilities

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Twenty-first century skills, such as inquiry and analysis, critical and creative thinking, written and oral communication, and problem solving, are recognized as essential learning outcomes of higher education. This study sought to examine the effects of utilizing a competing narratives pedagogical approach to increase students' critical thinking abilities in an entry level, semester-long natural resource management course. Students were encouraged to incorporate personal experiences in the analysis, synthesis, and evaluation of two distinctly different global warming viewpoints expressed in two separate narratives. Utilizing a pre-test/post-test design, all students enrolled in the course completed the Critical Thinking Assessment Test (CAT). A random subset of tests was then selected and scored by faculty evaluators. The CAT utilized fifteen short answer questions based on real-world situations to assess students' abilities to evaluate and interpret information, solve problems, think creatively, and communicate effectively. Re-

2015 NACTA Abstract Oral Presentations

sults showed statistically higher post-test scores on five of the fifteen specific skill areas assessed by the CAT and on the overall CAT score. The specific skill areas with statistically higher post-course assessments were students' abilities to evaluate strengths of correlational-type data, summarize patterns of results in graphs, identify and explain best solutions for real-world problems, use and apply relevant information, and identify suitable solutions for real-world problems. We concluded that enrollment in a semester-long natural resource management course utilizing a competing narratives approach has the potential to positively influence students' critical thinking abilities. This approach should be considered by instructors seeking alternative approaches to increasing students' critical thinking abilities.

115

Development of a Lean Hog Futures Trading Game to Enhance Student Engagement and Learning

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Animal science students often have little knowledge or understanding of commodity markets and struggle with the concepts and use of futures markets. To introduce swine production and management students to these concepts and principles, a futures trading game was developed. The game was designed to allow students to be producers or industry consumers looking to buy, sell, or hold contracts over four rounds of play. Each round included spot pricing, futures trading, and price expectation and verification. Students ($n = 49$) were evaluated through pre- and post-game assessments to determine if the activity increased their understanding, based on a scale where 1 = disagree and 10 = agree. Criteria for increasing knowledge was a positive change in individual assessment score, successfully applying knowledge was defined as 90% of the students receiving a grade of $> 80\%$ on the marketing section of the exam, and a successful educational experience was defined as the students rating the experience > 7 . All students significantly increased ($P < 0.05$) their knowledge of hog markets and their application of knowledge was significantly greater ($P < 0.05$) when participating in the futures game compared to traditional lecture only. Students enjoyed the method of learning (9.00) and believed it increased their comprehension of the material (8.83). Despite these positive results, students rated the industry and market realism of the game only average (5.09) and modifications to the game will continue to be made as the game

continues to be used in classes in order to cultivate students' interest in swine production.

116

Case Study Analysis: An Innovative Pedagogical Strategy that Facilitates Student Learning through Engagement in "Real Life" Community Food Systems Work

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Virginia Tech

Jenny Schwanke
YMCA at Virginia Tech

Concepts in Community Food Systems is a required course in the Civic Agriculture and Food Systems minor that embodies an experiential learning format for students to gain and apply interdisciplinary knowledge and skills in community food systems work. We will discuss how a case study assignment impacted the students' understanding of "real-life" food systems work. This pedagogical strategy facilitated student learning about the complexities of community food systems through interaction with practitioners. Students learned participatory research methods as they selected a case study topic and identified primary and secondary research methods to examine an organization or business involved with the respective topic. During 2015, 19 students used semi-structured interviews to investigate the topics of glean-ing, community supported agriculture, food pantries, U-pick farms, organic-food retail, food hubs, farm-to-institution programs, growers and food cooperatives, and sustainable farming. Assignments completed throughout the semester generated the following data about each organization or business identified: overview and history, inputs and outputs, challenges and opportunities, actions, and lessons learned. Each assignment built upon the previous work and included critical and creative reflections that were synthesized at the end of the semester as a written report and oral PechaKucha presentation. Students gained a broad perspective about food system complexities and advanced their research skills. The skills acquired are consistent with those essential for professional food systems practice. The case study assignment combined experiential learning with community engagement and effectively developed students' critical thinking, group problem-solving, and communication—all necessary skills for careers in community food systems.

2015 NACTA Abstract Oral Presentations

117

Enriching Student Engagement through Critical Reflexive Analysis

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Various forms of journal writing are often integrated into classroom activities to evoke critical thinking skills and enhance student engagement. Depending on course objectives, instructors may incorporate journal writing before or after an assigned reading, class discussion, or service-learning activity. Regardless, the common form of journaling is student reflection. The purpose of this presentation is to demonstrate the value of a form of journaling known as critical reflexive analysis (CRA). Here, the critical lens is turned back on the students, where they are challenged to take a course concept or related activity out of their reflective focus and, rather, transform it into an entry point by which the students then turn and critically analyze their personally constructed realities. By sharing results of a service-learning study abroad program in agricultural communication, the authors will demonstrate the value of formally incorporating CRA. With the program having an emphasis in cross-cultural engagement and understanding, and a methodological framework of autoethnography and grounded theory, the CRA entries: (1) revealed hidden assumptions about complex cultural issues; (2) derived new and unanticipated talking points, based on themes that emerged from journal entries; and (3) created an alternative space in which students, who struggled to or refrained from participating in group discussions, more comfortably articulated the moments in which they struggled to make sense of their personal assumptions. Using these course results, the authors will discuss applications of CRA in other disciplines, as well as examine additional reflexivity practices, such as image production and visual boxes.

118

Short-Term Study Abroad Programs: What is on Undergraduates' Minds?

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Literature shows that undergraduates should participate in high-impact activities, such as study abroad. As a result, universities and colleges of agriculture are encouraged to provide international opportunities for students. One popular option universities are offering are short-term study abroad programs. At North Carolina State University, there has been an increase in both short-term study abroad offerings and students' interest in participation. Consequently, it is important to examine students' motivations to participate in short-term study abroad programs. The participants in the 2014 North Carolina State University College of Agriculture and Life Sciences Agribusiness Study Abroad Program completed questionnaires and participated in rounds of pre-reflective and reflective focus groups before and after their time abroad. All of the data collected was broken down into themes and subthemes to analyze their motivations. Students were motivated to participate in a short-term study abroad program because they liked the short-term length of ten days, they were able to complete course credits while studying abroad, they were encouraged by personal interactions with faculty members and past participants of the short-term study abroad program, and they saw it as a valuable way to gain new experiences. The findings suggest undergraduates are motivated to participate in short-term programs by a variety of factors, which makes short-term study abroad programs a viable option for internationalizing our students' education in the universities and within the colleges of agriculture.

120

Teaching on My Mind: A Reflective Lesson Plan Template

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Teaching future educators how to effectively plan, teach, and reflect is a necessary, but challenging task. There are many components to teaching in a manner in which learning actually occurs. In effective lesson planning there are concrete items including: interest approach, objectives, introduction, content, activities, formative and summative evaluations and conclusion. In addition, teachers must consider audience, experience, environment, timing, and other variables. Teaching beginning teachers the necessary items they must consider is hard without a good foundation. In order to encapsulate all of the items needed to teach an effective lesson, a lesson plan template was adapted to better communicate the required items. In addition to the actual lesson plan, a "pre-teaching" reflection and "post-teaching" evaluation was added. These two areas of the lesson plan template

2015 NACTA Abstract Oral Presentations

were focused on encouraging students to more purposefully reflect on their plan and how well they taught the lesson. The revised template was used in a multidisciplinary teaching methods course in the spring 2015 semester (N= 43). For grading purposes, students submitted the lesson plan and reflection prior to their micro-teach. Students then submitted a revised lesson plan based on the post-teaching evaluation and instructor critiques. Lab instructors reported that students who followed the new template and answered the questions exhibited higher-quality lesson plans and demonstrated more effective teaching methods than compared to the previous semester. This template can be used by all educators, not just those learning the teaching process, to better plan and reflect on lesson design and delivery.

124

Cognitive Learning: Hands-On vs. Theoretical

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Teaching secondary agricultural students to weld is a common and popular element in many schools. Theoretical learning in the classroom occurs first, followed by hands-on instruction. Unfortunately, some schools are not equipped with a laboratory, making instruction through Virtual Reality (VR) an opportunity and perhaps a necessity. Dale's Cone of Learning from 1969 implies that less than 50% of what is read or given in lecture is actually retained in the cognitive mind, but 70% of what students actually get to practice is retained. VR allows the application of theoretical learning to a hands-on activity. The researcher divided 29 students into groups, with some learning to weld by hands-on laboratory practice and others by VR. Participants then completed an American Welding Society (AWS) 1G test plate. Anxiety and confidence levels were measured before a practice phase, after guided practice, and after completing the AWS test plate. Students who practiced welding through VR had a lower anxiety level than their counterparts before and after practice, but a higher anxiety level after the test weld; however, the hands-on participants were found to have greater confidence levels on all three occasions. Finally, 60% of the hands-on students passed an American Welding Society test weld following an AWS inspector's evaluation, but only 6.25% of the VR participants passed the test weld. The researchers concluded that while hands-on learning is still the best option for skill acquisition and the development of confidence, VR can help keep anxiety levels down for many students during the learning process.

127

Experiential Learning for a Combat Deployment

Cheryl Wachenheim
North Dakota State University

Agribusiness Development Teams were created within the National Guard to mentor Directors of Agriculture at the provincial level, as well as their staff and extension agents, cooperative leadership, farmers, and agribusiness entrepreneurs. Irrespective of the combat environment, mentoring would take place in a region without supporting infrastructure and modern farming technologies. The team was unfamiliar with many of the crops grown and livestock breeds raised in the assigned province and current technologies employed including hand tillage, hand seeding, and trench water holding combined with drip irrigation. The National Guard is not well equipped to educate about agriculture, including that of developing countries. To overcome this, team leadership used an innovative approach including experiential learning, networking, and reach-back capability. Key partners included industry, non-profits, government agencies, and universities. The model included a week-long training session at a regional university and four-day training at a university in California, which has a climate and tree and vine crops like those grown in the target province. The team also spent three days with an Amish community to learn more about farming without modern technology. This was supplemented with instruction and resources from an engineering non-profit devoted to the same. A large cooperative headquartered locally provided the team with three days packed with education on strategic planning, cooperatives, and development programming in agriculture. This innovative model of partnering with industry, universities, communities and non-profits to receive low and no-cost educational opportunities set the team up for a successful mission.

132

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

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Iowa is a local control state, affording teachers the ability to develop curriculum based on the needs of their students and community. Research has shown that teach-

2015 NACTA Abstract Oral Presentations

ers leaving post-secondary training are not always adequately prepared to teach the skills local stakeholders perceive as important. The purpose of this study was to determine how the quantity of agricultural mechanics training received [by secondary agriculture education teachers] at the secondary level impacts teacher perceived importance of the agricultural mechanics skills they teach. Respondents reported the amount of training they received at the secondary level and reported their perceived level of importance of 54 agricultural mechanics skills. Results indicated a significant positive correlation between teachers' secondary training received and perceived importance for 32 of the 54 skills; indicating that what teachers learned when they were secondary students has an impact on their instruction today. The findings from this study support Vygotsky's social development theory from 1978. The content teachers were exposed to in the social setting (as students), has reemerged intrapsychologically today in their teaching. Knowing experience at the secondary level has an impact on content teachers view as important, post-secondary faculty and industry should continue to help beginning teachers receive additional training and support in agricultural mechanics at the local level. Additional research should be conducted to determine if these findings hold true in other content areas secondary agricultural education teachers are responsible for teaching. Post-secondary content specialists can play a vital role in the preparation of future teachers and their students.

133

Translating Classroom Learning to the Real World: An Assessment of Agricultural Communications Capstone Students' Career Readiness as Part of Curricular Renovation Efforts

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The agricultural communications program at the University of Nebraska-Lincoln has recently undergone several changes to focus on communication more broadly (rather than journalism), yielding several curricular changes. One of the most substantial changes was to the program's capstone course. The purpose of this research was to gauge student perceptions and assess performance in the capstone course where students serve as staff writers for a University publication. Students completed reflection activities as part of an experiential learning approach and reported feeling positively about

conducting interviews with scientists and university administrators, noting internships were the most valuable experiences that prepared them for the course. Students reported frustration in not being able to exercise skills perceived as their strengths (broadcasting, advertising, and public relations) and about being asked to write long-form magazine stories without more in-depth preparation. The instructional team reported students performed well in terms of relational behavior when interviewing sources, but overall writing abilities and critical thinking skills were well below expectations. Recommendations for improving student skills include requiring students take newswriting and editing courses through the College of Journalism and Mass Communication, specific integration of writing-intensive activities in each of the program's current courses, and an overall emphasis on professional communication skills rather than segmented areas such as broadcasting or advertising. These recommendations have been incorporated into the ongoing curricular renovation.

136

The Use of Current Events to Enhance Student Learning in Agricultural Genetics

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The objective of this study was to determine if student learning was enhanced by using current events assignments in an agricultural genetics course. Genetics is a required course in the Department of Animal Sciences and Industry at Kansas State University, and consists of 4 units. In fall of 2013, students were asked to find 5 current articles that related to genetics in livestock, companion or exotic animals, crops or horticultural plants, or humans. They were required to write a 1 page paper summarizing the article and describing how it related to concepts covered in class. Performance on pretests and posttests were recorded for 2012 (n = 121) and 2013 (n = 129), and 2013 students filled out a survey about the assignment. For units 1, 3, and 4, student improvement from pretest to posttest was greater in 2012 than 2013 ($P < 0.01$). For unit 2, improvement was greater in 2013 ($P = 0.02$). On the survey, students indicated that the current events articles were only moderately helpful with a 2.9 score (1 = not helpful, 5 very helpful). This would indicate that the current events articles were not effective in improving student learning in most of the units. However, most articles were submitted at the end of the semester, which would not allow them to impact improvement early in the semester. Results show that incorporating current events assignments into the course

2015 NACTA Abstract Oral Presentations

did not help with overall student learning when articles were due at the end of the semester.

142

Recent Graduate and Undergraduate Enrollment Trends in American Soil Science Programs

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Continuous research and instruction about the soil is vital in sustaining its ability to perform production, ecological, health and engineering functions. Continued training of new soil scientists is important to ensure that are stewards who will study and sustainably manage the soil resource for generations to come. This investigation

aimed to assess recent enrollment trends in soils science graduate and undergraduate programs in the United States. Fourteen universities that offer undergraduate and/or graduate programs in soil science were surveyed for their enrollments over the time period 2007-2014. The schools surveyed represent ~20% of the institutions that offer soil science degrees in the U.S. Simple linear regression was used to find the slope of best-fit trend lines. Of the 13 schools that reported undergraduate data over the surveyed period, six showed increase in enrollment, five had stable enrollments, one showed decline, and one discontinued their undergraduate degree program. The linear regression trend line for the undergraduate schools' composite data had a slope of 55.0 students/year ($R^2 = 0.96$), indicating a strong overall trend of undergraduate enrollment growth. The linear regression trend line for the composite graduate school data had a slope of 12.0 students/year ($R^2 = 0.97$), indicating an overall trend of enrollment growth at these schools. As a whole, both the undergraduate and graduate programs investigated showed moderate growth trends, which represent a reversal of the reported declining trend at the beginning of the 21st Century.

146

Experiential Learning: Taking Knowledge From on Our Minds and Putting it into Student's Hands

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Success in the field of agriculture requires applying base knowledge to solve real-world problems; a skill that can be developed through experiential learning in college courses. Our objective was to determine student perception of experiential learning before and after hands-on activities. Students ($n=49$, 69% female) in two upper-level animal production courses were surveyed with a post-then-pre instrument that asked them to rate their before (BEF) and after (AFT) perception of hands-on activities ($n=5$) from 1 (not at all) to 5 (very much) in four categories: familiarity, satisfaction, performance, and importance. Each class activity was scored by researchers regarding the amount of hands-on component: minimal (MIN), moderate (MOD) and completely (COMP). Data were analyzed using PROC GLM of SAS. Students reported increased AFT scores for all activities across all four categories (2.9 ± 1.4 (BEF) vs. 4.5 ± 0.7 (AFT); $P < 0.001$). Additionally, students had higher AFT scores for MOD and COMP compared to MIN activities (4.5 ± 0.8 (MOD) and 4.7 ± 0.6 (COMP) vs. 4.3 ± 0.9 (MIN); $P \leq 0.017$). Both the MOD and COMP activities had greater

2015 NACTA Abstract Oral Presentations

changes in perceptions of experiential learning when compared to MIN (1.8 and 1.6 vs. 1.5; $P < 0.001$). Findings indicate that students perceive experiential learning to be important to their future success and place more value on activities that have a more intensive hands-on component. Students also believe they are better equipped to perform hands-on tasks in their future careers after experiential learning opportunities.

147

Creating Active Learning Environments Which Evoke Change Through Development of Advocacy and Leadership Skills

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The importance of equipping students with advocacy and leadership skills has never been more important to the future of agriculture. An Animal Sciences course established to equip students with the ability to be effective spokespersons and leaders for agriculture within the campus, communities, and society was used to create a flipped classroom (FC) teaching modality. The FC embraced technology, social media, engagement and customized student-led project work. Early in the semester, students developed a mock corporation with vision, mission and strategy plans focused on developing and practicing advocacy skills around agriculture. Students served as organizational board members and CEO teams operated weekly to plan agendas and facilitate project management process. Brainstorming techniques were used to strategically plan the learning activities and projects for the semester. Areas of work pursued were: Inform and educate themselves, research current topics, become informed on perspectives, determine source credibility, select media approaches, create content for presentations and documents, create organizational partnerships, execute outreach activities, and train fellow millennials through multiplier training. The project's expectations and accountability emerged from students as guided by the instructor. Pre- and post-survey assessment support learning outcomes whereby students are: 1) better prepared to systematically analyze and discuss issues facing agriculture from producer, consumer and legal/ legislative perspectives; and 2) enabled leadership practitioners capable of positively influencing individuals, small groups, and organizations. The engaged FC approach allowed the instructor to deeply engage students with problem and evidence-based learning skills resulting in improved learning outcomes around issues management, media training and discussion techniques.

149

Exploring Institutional Dimensions of PK-12 Engagement of Agriculture Faculty and Staff

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Perceptions and motivations of faculty and staff to engage with PK-12 audiences can inform opportunities and barriers for Colleges of Agriculture to enhance PK-12 engagement initiatives. Wade and Demb's Faculty Engagement Model from 2009 was used as a conceptual framework to study three factors of engagement: personal, professional, and institutional dimensions. A questionnaire was adapted from Wade and Demb's faculty engagement instrument. In 2013, a total of 94 faculty and staff in Purdue University's College of Agriculture responded to a survey aimed at gaining a better understanding of the extent to which they engaged with PK-12 audiences, and to explore the elements of institutional dimensions regarding faculty engagement behaviors. Results indicated in the 2011-2012 academic year, faculty and staff used their expertise to serve the needs of PK-12 audiences 0 times (3%), 1-4 times (40.3%), 5-10 times (17.9%), and greater than 10 times (38.8%) ($n = 67$). Eight items relating to institutional dimensions of PK-12 engagement were examined. Based on the mean scores, participants agreed with three items regarding support for PK-12 engagement: University mission, University leadership support, and community interest in developing collaborations. Participants did not agree with five items regarding support for PK-12 engagement: University priorities, University financial support, University promotion and tenure system, University infrastructure, and faculty commitment. Taking these results into consideration, recommendations can be made regarding methods to increase engagement, including increasing recognition of PK-12 engagement to support promotion and tenure, and providing adequate financial support for participation in PK-12 engagement.

152

Learning Gains and Teaching Strategies for a 21st Century Education in Animal Sciences: Result of a National Survey

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A survey was conducted during two conferences on teaching and learning in the animal sciences and data from 148 instructors from 68 academic institutions were

2015 NACTA Abstract Oral Presentations

used to evaluate instructors' perception of the relative importance of 18 learning gains (LG) for undergraduate students and their correlation with 16 teaching strategies (TS; type of courses and out-of classroom experiences). Multivariate techniques was used to reduce the number of variables and factor analysis identified three LG factors that explained 55% of the cumulative variance: a) essential core knowledge (LG1, e.g., in depth knowledge of disciplines), b) desired skills (LG2, e.g., communication and critical thinking,) and c) peripheral LG (LG3, e.g., global issues and language). Five factors explained 61% of the cumulative variance of TS: a) real-world hands-on courses and experiences (TS1, e.g., internship, capstone courses), b) communication, and team-based TS (TS2, e.g., writing-intensive courses and courses with collaborative assignments,) c) global and research experience (TS3, e.g., study abroad and undergraduate research), d) using internet as a teaching and learning tool (TS4) and e) Powerpoint-based lecture courses (TS5). Spearman correlations among factors indicated that LG1 was correlated with TS3 ($r=0.32$, $P=0.0002$), TS4 ($r=0.34$, $P<0.0001$), and TS5 ($r=0.20$, $P=0.02$), LG2 was correlated with TS1 ($r=0.37$, $P<0.0001$) and TS2 ($r=0.22$, $P=0.01$), and LG3 was correlated with TS1 ($r=0.40$, $P<0.0001$) and TS3 ($r=0.29$, $P=0.0007$). Participants recognized the unequal effectiveness of distinct TS to foster a specific LG. Identified categories (factors) might prove useful to assess the alignment between expected learning gains with teaching methods of academic programs.

159

Distinct Viewpoints of Change as a Result of Study Abroad

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A record number of US students participated in study abroad programs in 2014. As study abroad participation increases, deeper understanding of global learning's impacts on participants is necessary. The purpose of this study was to measure how students change as a result of a 30-day study abroad program. The study utilized Q Method and factor analysis to identify patterns and characterize viewpoints on change in students who participated in a study abroad program. A population representing diverse perspectives (The P set) sorted statements with outcomes of studying abroad (The Q set) into a continuum from "most like me," to "least like me," (The Q sort). Principal Component Analysis was then used to determine factors to extract, yielding a three-factor solu-

tion. After Varimax factor rotation, factors were characterized and defined using distinguishing statements. Thus, each represents a distinct viewpoint about how students change from studying abroad. Factor 1 (Confidence) was characterized by statements of enhanced confidence, comfort, and self-knowledge. Factor 2 (Contextualization) was characterized by statements about enhanced perspectives, comparisons, and ability to contextualize ideas. Factor 3 (Collaboration) was characterized by statements about enhanced patience, tolerance, and listening skills. Practitioners will be better equipped to plan and facilitate global learning, armed with deeper understanding of how students change (specifically through confidence, collaboration, and contextualization) from study abroad.

163

Communication and Subject Preference among Freshmen in a College of Agriculture

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Appropriate and acceptable avenues of communication are critical for freshmen students to be aware of university, college and career opportunities. This study was designed to elucidate the preferred method of communication as well as to identify the areas of highest interest concerning those communiques. A sliding scale (0-100) survey was given to 120 freshmen enrolled in the College of Agricultural Sciences to discern preferred communication avenues and content format. Student distribution across majors was as follows: Agribusiness (8%), Animal Science, Food and Nutrition (43%), Forestry (18%), and Plant, Soil and Ag. Systems (32%). Respondents preferred communicate's as list-serve emails specific to majors (76.3), continuation of the current college wide list-serve email (55.7), posted fliers (44.2), and Facebook (37.1), which comprised the top 4 of 9 choices available. Students indicated that they were most interested in specific information regarding scholarships (82.4), internships (71.1), local job postings (71.1) and advisements (67.7). Interestingly, the financial cost of higher education was also identified by students who were drawn to enroll into the college by the specific curriculum (62.5), the cost of education (59.6), the campus community (54.6) and faculty expertise (46.7). Undergraduate students in the college tend to be employed during their studies, and seek a path for career development and future placement. Students indicated that three of the top four areas of interest involve current or future employment opportunities while the cost of education was the second largest factor governing college

choice. Therefore, financial concern is an important consideration for entry level students.

166

Who Fills the Seat: The Demographics, Perceptions, and Knowledge Base of Students Enrolled in the Introduction to Animal Science Course at Oklahoma State University

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Understanding the background and self-perceived knowledge of students enrolling in Animal Science courses is critical for developing curriculum to enhance student learning. In the fall of 2014, demographic and self-perceived knowledge surveys were administered to students (n= 385) enrolled in Introduction to Animal Science at OSU. Of the 333 respondents, 62% were in state, 71% were female and 58% had been involved in a youth agricultural organization prior to enrollment. Additionally, 5% of respondents indicated they had never visited a farm, while 12% and 23%, respectively, indicated an educational field trip or visiting a friend as their only farm experience. Interestingly, 21% of students with prior organizational involvement indicated they had never visited a farm, while 14% of students with no prior organizational involvement lived and worked on a farm. Of the students with prior organizational involvement, 42% indicated beef cattle as their species of interest followed by equine (19%) and companion animals (12%). Additionally, 39% felt they had considerable or extensive knowledge about beef cattle, while 70% of students with no prior organizational involvement indicated no or very little knowledge. Fifty percent of students with no prior organizational involvement indicated companion animals as their species of interest followed by equine (26%) and beef cattle (12%). Additionally, 53% felt they had considerable or extensive knowledge about companion animals, while 57% of students with no prior organizational involvement indicated no or very little knowledge. This research suggests the need to implement curriculum addressing student's needs in an introductory animal science course.

167

Student Delivery and Discovery Skills and Performance in Animal Science Courses

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Different types of courses require different skills by students. The objective was to investigate the relationship between two types of students' personal skills and their performance as measured by course grade. The population consisted of 55 students in two Animal Science courses (Animal Reproduction and Animal Products) at the University of Idaho. A 20-question survey was used to assess an individual's Delivery skills (planning, detail-oriented, executing, and self-disciplined) and Discovery skills (questioning, observing, networking, and experimenting). Based on the score, the skill for each type was categorized into three levels: High, Moderate, or Low. There was a moderate association between Delivery skills and exam scores ($r^2 = 0.4$, $P < 0.01$). The course grades were 88.1 ± 3.1 , 79.5 ± 2.3 , and 71.5 ± 3.6 for H, M, and L Delivery skills, respectively. Discovery skills and exam scores had little association ($r^2 = 0.1$, $P > 0.5$). Overall, when exam scores of Delivery skills were compared, students with high Delivery skill earned the highest grades, whereas Discovery skills had little influence on exam scores in these two courses. Students with high levels of Delivery skills tend to excel at planning, attending to detail, executing, and self-disciplined. If course content is structured for memorization and fact acquisition, then instructors are encouraged to help students develop Delivery skills. If course content requires exploration and innovation, then instructors should encourage Discovery skills (like questioning, networking and experimenting), and provide feedback on these skills using course grades and assignments.

169

Perceptions of Internships in an Agricultural Associate Degree Program

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Collegiate internships offer benefits to students, educators, and employers. The Agricultural Institute at North Carolina State University has offered the option for students to complete an internship; however it has not been a requirement of the degree program. There is high interest from stakeholders to require internships and Agri-

2015 NACTA Abstract Oral Presentations

cultural Institute administrators are committed to preparing students for future careers. However, the perception of Agricultural Institute faculty with regard to internships is not currently known. A survey was used to determine the benefits, barriers, and importance of incorporating an internship program into the degree requirements. The sampling frame of the study was 42 faculty members of the Agricultural Institute. Twenty-two individuals completed the survey for a 52% response rate. On a 5 point Likert scale (5 = *strongly agree*, 1 = *strongly disagree*), respondents recognized the benefits of internships (\bar{x} = 4.15), yet they do not feel internships are of importance for Institute students (\bar{x} = 3.59), nor do they think they should be required for graduation (\bar{x} = 3.52). This suggests there are strong barriers in the way of more favorable perceptions. Further analysis revealed that 81% of faculty believes students will not complete unpaid internships, and over 72% feel student commitments to family businesses or other jobs is a significant barrier. Correlations revealed no significant relationships between gender or years of experiences, on their perceptions of internships. It is recommended university administrators investigate these barriers to determine if they warrant not moving forward with the degree requirement.

170

Integrating Polarized Perspectives to Challenge Graduate Student Opinions

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Increased political and public attention to agricultural policy and industry practices has created a need for graduates in the agricultural sciences to formulate and defend professional opinions regarding contemporary agricultural issues. Historically, instructors at Sam Houston State University have used classroom lectures and student debates to foster development of professional opinions and awareness of contemporary agriculture issues among graduate students. After personal exposure to various anti-conventional agriculture films, instructors decided to incorporate polarized pieces of media to facilitate graduate discussion as an alternative to standard lecture. Twenty graduate students enrolled in the course completed pre/post-exposure free response surveys polling their beliefs on topics discussed during class after various media were introduced. Preliminary qualitative analysis shows that 65% of students reported a shift in personal beliefs after media introduction and course discussion centered on food labeling and consumer awareness. Conversely, students voiced

no change in personal beliefs with respect to the perceived role of agricultural producers, and disparities of on-farm labor, after media exposure and discussion. Overall, instructors found polarized media exposure and classroom discussion on contemporary issues caused students to evaluate and defend their own professional opinions. Future research will include analysis of the impact of media type and frequency of use, and student engagement and literacy associated with contemporary agriculture issues.

172

Cognitive Tasks Required in Undergraduate Courses: A Comparison of Agriculture and Non-Agriculture Students

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University of Arkansas

Bloom's Taxonomy describes six increasingly complex levels of cognition: knowledge, comprehension, application, analysis, synthesis, and evaluation. Research has consistently shown a majority of teaching, questioning, and testing in university agriculture courses occurs at the three lowest levels of cognition. However, little is known about how agriculture courses compare to non-agriculture courses. This study was conducted to compare the self-perceived levels of cognition required by freshmen and senior agriculture and non-agriculture students at the University of Arkansas. Data were collected as part of the university's administration of the National Survey of Student Engagement (NSSE) and were provided by the Office of Institutional Research. Among freshman, agriculture ($n = 218$) students reported significantly less engagement than non-agriculture ($n = 2,577$) students in course activities requiring analysis [$t(2,558) = 2.35$; $p = .0189$], synthesis [$t(2,157) = 2.10$; $p = .0446$], and evaluation [$t(246.67) = 2.11$, $p = .0356$]. Among seniors, agriculture ($n = 301$), students reported significantly less engagement in course activities requiring analysis [$t(2,498) = 3.81$, $p = .0001$] and synthesis [$t(2,213) = 2.57$, $p = .0103$] than non-agriculture ($n = 2,361$) students. In summary, both freshmen and senior agriculture majors reported less frequent use of higher-order cognitive skills compared to their non-agriculture peers. These findings provide a strong rationale for examination of both what is taught in college agriculture courses and how it is taught. If the development of critical thinking skills is a fundamental goal of education, agriculture courses must provide students with frequent opportunities to practice these higher-order skills.

173

Agricultural Media Writing Students' Self-Perceptions of their Writing Abilities

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Deep writers are reflective revisionists who have the ability to elaborate and engage their audience. Writing apprehension and self-efficacy influences one's ability to become a deep writer. Therefore, the purpose of the study was to document agricultural media writing students' self-perceived writing abilities. Twenty-one agricultural communications and journalism students enrolled in a media writing course at Texas A&M University completed the Media Writing Self-Perception (MWSP) questionnaire. The MWSP included five sub-scores—elaborative/surface (−13 to 31), reflective/revisionist (−19 to 25), writing self-efficacy (3 to 39), writing apprehension (−13 to 31), social media/professional (−4 to 28)—as well as a MWSP total score (−88 to 112). Students perceived themselves as surface-level writers ($M = 13.33$, $SD = 6.97$) who do not engage in reflection while preparing to write or do not spend quality time revising ($M = 6.19$, $SD = 5.21$). Students noted they are confident writers ($M = 29.33$, $SD = 5.35$) who enjoy writing and experience low anxiety and worry related to writing ($M = 1.48$, $SD = 6.74$). Students documented social media writing is different than professional writing ($M = 5.90$, $SD = 4.24$). Overall, students' MWSP scores ($M = 41.48$, $SD = 19.58$) showed that they moderately enjoy writing and have confidence in their writing abilities. However, students should spend more time reflecting on writing and producing multiple drafts while engaging in the revision process. Students enter agricultural media writing courses with varied levels of writing abilities. Therefore, instructors must create curriculum that challenges deep-level writers but accommodates surface-level writers who need instruction to encourage deep-level writing.

175

Relationship between Academic Engagement and Student Satisfaction

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188Research shows that students who are more academically and socially engaged tend to perform better and graduate at higher rates than their less engaged

peers. The purpose of this study was to determine if a single or linear combination of student engagement variables could explain a significant ($p < 0.05$) portion of the variance in institutional satisfaction of senior agriculture students ($n = 144$). Data were obtained from responses to the University of Arkansas' administration of the 2013 National Survey of Student Engagement. Ten engagement variables were measured using summated scales with possible scores ranging from 0 to 60. Satisfaction was measured using a two-item summated scale with possible scores ranging from two to eight. Mean engagement scores ranged from 26.95 (Student-Faculty Interaction) to 44.08 (Quality of Interactions); the mean satisfaction score was 6.77. Eight of 10 engagement variables had significant positive correlations with student satisfaction. After assessment of first-order correlations and intercorrelations between the eight significant engagement variables, student satisfaction was regressed on three potential predictor variables: Quality of Interactions, Collaborative Learning, and Supportive Environment. The equation containing these variables accounted for approximately 31% of the variance in student satisfaction, $F(3,102) = 15.17$, $p < 0.0001$, adjusted $R^2 = 0.28$. Further analysis, using squared semi-partial correlations, indicated that Quality of Interactions explained 12.55% of the unique variance in student satisfaction, followed by Supportive Environment (4.08%), and Collaborative Learning (3.08%). These findings indicate students' positive personal relationships and campus academic and social support services are important to student satisfaction.

176

Student Perceptions of Flipping an Agricultural Teaching Methods Course

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The creative use of a flipped classroom provides increased one-on-one time between the teacher and the student and allows for the use of critical thinking skills during class time. This study explored undergraduate students' perceptions of experiencing a flipped classroom in an agricultural teaching methods course. Two of the four participants were preparing to student teach the following semester and the rest planned on student teaching the following year. Basic qualitative methods were used to provide flexibility, rich description, and the

2015 NACTA Abstract Oral Presentations

emersion of common patterns and themes. The major themes included: (a) benefits and drawbacks of online lectures, (b) knowledge and skill development, and (c) overall perceptions of the flipped classroom. Participants reported the online lectures were beneficial and provided order and structure to the learning process. Personal responsibility emerged as a subtheme with mixed response. Some participants felt it was the responsibility of the students to watch the videos and make sure they understood, while others felt it was too much responsibility on the students. All participants acknowledged the online lectures were a valuable tool for delivering content knowledge. All participants reported that online lectures combined with the learning activities during class meetings deepened their knowledge of teaching and learning application and skill development. Overall, participants felt the flipped classroom approach was a confidence booster due to the use of class time to practice their skills and higher order thinking abilities. Participants recognized the flipped classroom as an effective teaching approach for preservice teachers.

178

Creating an On-Campus, Multidisciplinary, Experiential Learning Ecosystem for Student Interns to Solve Engineering and Business Problems for Companies

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This paper documents how a grant and contracted funded program can be used to create a multidisciplinary, on-campus, experiential learning ecosystem for student interns. The New Product Development Center (NPDC) at Oklahoma State University employs 30-35 undergraduate and graduate students from engineering disciplines (including agricultural engineering), agribusiness, agricultural communications and economics. The on-campus interns are mentored by NPDC staff and faculty members and solve product and process design problems and complete marketing and business planning projects for manufacturers in rural and urban areas in Oklahoma. Grants from more than 10 state and federal agencies as well as contracts with individual companies have been used to fund students, staff and faculty. NPDC staff has grown from two one-half time graduate students in 2005 to 5 full-time faculty and staff and one one-half time faculty member in the past 10 years. Students work as interns for up to three years and progressively are given more challenging projects as well as responsibilities for communicating with client company managers. Economic development impacts of the stu-

dents projects include jobs created and retained, cost savings, revenues generated, and sales retained and are monitored by surveys of the client companies. We document how the center was created and grown into its current form that completes projects for 50-60 inventors and 30-40 companies each academic year. Case studies of successful grant proposals, student-client relationships, and employment opportunities created are presented.

179

Common Core Kids Go to College: "Readiness" or Not? Here They Come

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It's been three years since the Common Core Standards were adopted and the mandated reading and writing standards have been taught in all content areas classrooms, Kindergarten through twelfth grade, in all but two states. One of the big pillars or "promises" of the standards is the "college and career readiness" of all students. One of the key understandings of Common Core learning is also a shift in teaching. No longer are K-12 science teachers only responsible for teaching science content, they are also responsible for the CCSS ELA standards, which translates to, both teaching students the science content as well as teaching students how to read and write like a scientist. Students that are products of the Common Core are coming to college with more developed cognitive skills like creativity and problem solving, evaluation of claims and arguments, inquiry, generating hypotheses, analyzing data and interpersonal skills like perseverance, effort and teamwork. In addition, Common Core students have more developed speaking and listening skills--they have discussed more, argued more, debated more than students pre-Common Core and are coming to college ready to think, talk, question and learn.

2015 NACTA Abstract Oral Presentations

181

More Than a Number: Efficient and Effective Academic Advising

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Efficient and effective college advising means the advising meets the needs of the college/university and meets the needs of the students. But, what does it mean to meet the needs of the students and what does efficient advising look and sound like? How long does it take? Is there a proper way to do it? And how will I know when to do what? Many students that come to college are leaving the security and safety of home for the very first time. In addition to course recommendations, strategic plans of academic actions and a knowledge of university rules and procedures, many students also need some academic nurturing. This means encouraging students to make appointments with you, being available for face to face meetings, asking questions, listening, and giving health and wellness recommendations. In addition to retaining the advisees you have, advising also means recruiting new students into your department through various means and practices. Visiting the University Advising Center, College Advising Center as well as high school visitors and schools. Advising is more than just giving programmatic advice...it's helping students be successful for their future college program and life.

185

Student-Centered Active Learning Environment with Upside-down Pedagogies: Student Performance and Course Evaluations in a Flipped Biology Classroom

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The objective of this study was to compare students in the SCALE-UP program to students in a "traditional" classroom with regard to performance on a final exam, overall course grade, and course evaluations. SCALE-UP is an acronym for "Student-Centered Active Learning Environment with Upside-down Pedagogies". The goal of SCALE-UP is to facilitate hands-on, interactive, highly collaborative environments for large undergraduate courses. The project employs different pedagogical methods and classroom management techniques to foster an environment of lively interaction and group dis-

covery. The present study analyzed the final exams (both short answer and multiple choice performance) and final course grades of four sections of Biology 181 (n= 659) and four sections of Biology 183 (n= 618) taught by the same instructor between 2013 and 2014. Results found no significant differences between SCALE-UP and traditional students on any of the three performance measures. A separate analysis was performed on the end of course evaluations from five sections of Biology 181 (n=501) and four sections of Biology 183 (n=312) which included the same course sections used in the performance analysis. One-way ANOVA's confirmed no differences within section over time. T-tests indicated a significant difference on overall course evaluations scores between the SCALE-UP (4.37) and traditional groups (4.19) (t -2.6, p.009) and several significant differences on ratings of the instructor in favor of the SCALE-UP section. The study suggests that the SCALE-UP program can be implemented with similar marks for student performance outcomes while being a more enjoyable experience for students.

191

Factors Affecting the Success in College of Latino International Students

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As depth and breadth of knowledge in food, agricultural, and natural resources becomes increasingly crucial to addressing major global challenges, colleges of agriculture need to double efforts to attract high quality students. Some recruitment efforts are now focusing on students from Latin America. These students are both central to the enrichment of education programs in the US, and to future programs for the needs assessment, research, planning, implementation, and evaluation of solutions to problems of food security, environmental degradation, and economic and social sustainability in the Americas. While many work to decrease recruitment and funding hurdles, less focus has been placed in the success of these students, as well as their engagement and retention in the world of agriculture. We will present a framework summarizing the results of an analysis of the literature about the factors affecting the success of international students in US colleges, and discuss some case studies and its application to the case of Latino International students in colleges of agriculture. Key elements of the framework include background variables (preparation, family socio-cultural-economic characteristics, initial expectations, identity), financial and personal conditions while in the US (work, family support, financial

2015 NACTA Abstract Oral Presentations

situation), campus environment (presence of other students with similar background, peer-support systems, racial climate and diversity), engagement and involvement opportunities (student organizations and social events, extracurricular activities, international student life programs, and counseling services), and academic environment (availability of academic support programs, faculty-student mentorship and interaction, class and program size, classroom dynamics, program integration, faculty effectiveness, advising systems).

194

How Faculty Engage in Scholarship of Teaching and Learning

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The call of ensuring the effectiveness of postsecondary education has been issued from all levels of society: from policymakers in Washington D.C. to parents in rural America to students currently enrolled in institution of higher learning. An undergraduate researcher in a college of agricultural sciences conducted a descriptive study with a purpose of determining how instructional faculty from the previous academic year in the The Pennsylvania State University, College of Agricultural Sciences perceive their engagement in Scholarship of Teaching and Learning with an emphasis on instructional assessment. The study was guided by three research objectives: (1) identify agricultural sciences faculty sources of instructional assessment. (2) describe agricultural sciences faculty perceptions of effectiveness of instructional assessment to improve teaching practice and (3) describe other measures of scholarship of teaching and learning College of Agricultural Sciences faculty utilize. A valid and reliable quantitative survey was administered with accepted survey methods via an online survey tool. The response rate of 67% from the population of 168 individuals yielded 113 responses from the eight academic units in the college. The results indicate that faculty members engage in this form of scholarship and reflection due to mandates as opposed to desires for teaching and learning gains and perceive evaluations as being less than effective. These results confirm findings from previous studies that a majority of instructors engage in the Scholarship of Teaching and Learning, specifically instructional assessment; however, further investigation is needed to determine impact of the scholarship of teaching and on student learning outcomes.

198

SAFE: A Program Development Initiative to Address Sustainable Agriculture and Food Environment Opportunities

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An increasing number of new and small farm operators in the U.S. are seeking technical information on agriculture and food systems. Yet, many new and small farm operators have limited previous agricultural experience and the technical information sought by this group varies from traditional commodities to sustainable farm practices. Administrators, instructors and researchers at Sam Houston State University are actively engaging these emerging educational opportunities through a three-prong, United States Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) capacity building opportunity known as the Sustainable Agriculture and Food Environment (SAFE) program. Educationally, the SAFE program initiatives are perusing the introduction of an online master's degree and certificate in Sustainable Agriculture as an opportunity to provide a specialized degree to fill this information gap. Secondly, the program looks to bridge technical informational gaps regionally through SAFE outreach events aimed at fostering producer, government, and industry education, networking, and collaboration opportunities. Lastly, the program targets advance scholarly research opportunities within the field of sustainable agriculture. Over the last year, the SAFE program has had successful advancements across all three program initiatives. Specifically, the University Academic Affairs Council approved the SAFE Master of Ag Degree, and certificate in Sustainable Agriculture (Effective Fall 2015). The program held its first outreach event, The Texas Alternative Agriculture Producers' Forum in June of 2014, and subsequently presented its first scholarly presentation on producer perceptions research at the 2014 International Annual Meeting of the Crop Science Society of America.

2015 NACTA Abstract Oral Presentations

199

Evaluation of Multiple Sections of a Single Animal Science Course for Consistency of Instruction Quality

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Some instructors teach numerous sections of the same course during a single semester. This may lead to differences in student performance as some information is forgotten or presented in a different manner across sections. The objective of this study was to evaluate GPA, average final course grade, and student evaluations of four sections of a sophomore level animal science course taught by a single instructor. To accomplish this, student GPA at the start of the semester, final course grade, and student evaluations of the instructor were recorded for each section of the animal science course. Each section (8:00 am; 9:30 am; 12:30 pm; 3:00 pm) was taught twice a week on Tuesday and Thursday. The PROC GLM procedure of SAS 9.2 was used to determine differences among sections. There was a tendency for students from the 8:00 am and 12:30 pm sections to enter the class with a higher GPA than students from the 9:30 am or 3:00 pm sections; however, final course grades did not follow the same pattern as no difference was detected between any of the sections. Student evaluations (1-5 scale; 5=excellent) of these sections showed a steady improvement from the start of the day (3.7) to the end of the day (4.1) suggesting that the instructor was better able to teach the class as the day progressed; however, improved instruction techniques did not translate into improved student grades.

202

Epistemological and Pedagogical Beliefs of Award-Winning Post-Secondary Agriculture Faculty at Two Agricultural Universities

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The intent of this qualitative study was to examine the epistemological and pedagogical beliefs of award-winning post-secondary agriculture education teachers at two agricultural universities, Penn State University, College of Agricultural Sciences and The Swedish University of Agricultural Sciences (SLU). The study employed a multiple case-study approach, utilizing a basic

qualitative design to frame their one-on-one structured interview research methods. The results were discovered through in-depth analysis for rich description expressing the faculty member's beliefs they hold about their teaching. Findings revealed lecture as the dominant teaching method currently in use by SLU Faculty. Lecture with integrated active learning techniques was the dominant teaching method by Penn State University Faculty. Data revealed current teaching strategies were influenced by prior educational experiences; however, there was very little exposure to instruction in teaching methods. Although faculty at both institutions had received very little training in teaching, all felt confident in their ability to teach. Findings revealed the teaching beliefs and philosophies of interviewed faculty were well established, however, faculty were aware the practices used in the classroom did not necessarily align. Faculty interviewed agreed class size, time, and budgetary constraints affect the teaching method employed; because of different constraints they are limited to employing some of their philosophical beliefs in the classroom. More empirical studies are therefore needed for researchers to build better understanding about which belief affects which action, and subsequently how to address or change teachers' beliefs. Future research should refer to student ratings of teaching effectiveness to compare longitudinally.

203

Cross Pollination of Undergraduate Instruction to Promote Global Learning

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The agricultural industry seeks leaders who are prepared to engage in complex global problems requiring the utilization of a wide range of disciplinary skills. With the knowledge of this need and the understanding that not all students will participate in transformative immersive learning experiences such as study abroad, instructors from two different classes from two separate disciplines collaborated to allow for authentic application of skills in a contextually relevant problem. One course was an agricultural teacher education (AEE) course called Global Agricultural Education. The other course was an embedded study away course in community, economic, and development (CED) called Local Rural Development in Costa Rica. The AEE course did not have a travel component. The CED course traveled to Costa Rica to work in a small rural community for one week. The CED students sent requests to the AEE course for curriculum

2015 NACTA Abstract Oral Presentations

material with culturally specific pedagogy appropriate for first through sixth graders in the area of agriculture. AEE students developed lessons and presented to CED students for them to select. CED students implemented lessons in Costa Rica and reported back to the AEE class on the outcomes of the instructional experience. Throughout process, instructors witnessed development of not only global competency in both sets of students, but development of 21st century learner skills of creativity, collaboration, communication and critical thinking. Additionally, the local in-country partners were pleased with the results. Future plans include continuing to develop meaningful partnerships to further the educational goals of widely varied student disciplines.

205

Using Simple Technology to Engage Student Learning in Large Enrollment Courses

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Engaging hundreds of students in the learning process in large lectures can be difficult for students and instructors. The objective of this presentation is to describe the successful use of three simple technology tools to engage students in a large enrollment cross-disciplinary leadership course. For the past three semesters instructors in AGED 260: Introduction to Leadership Studies have used varied levels of 1) Audience response systems (I-Clickers), 2) flexible group project assignments and 3) purposeful use of music during lecture to engage 180 students in a large theatre-style classroom. I-Clickers are used to test knowledge and application of course concepts and to enhance student interaction. The group project teams must present a summary of the main leadership theories covered in the course using a technology-based format. They are given one rule: no PowerPoint or Prezi. Music is used during class to energize the students and to signal an experiential learning activity with their peers. Music is carefully selected to fit with the course content for each class period. Students reported spending more time focused on understanding material presented on scored vs. non-scored I-Clicker questions and data comparing semesters showed an increase in correct responses to scored vs. non-scored I-Clicker questions. Students have created videos, Wikis, blogs, raps and web-enhanced stories that were far more creative and interactive than when PowerPoint and Prezi were allowed. The course is consistently rated excellent by the students and feedback about the teaching methods and choice of project deliverables is also highly rated.

207

Cultivating Personal and Professional Development: The Benefits of a Student Designed Agricultural Industry Tour

Josh Stewart*, Thomas M. Henderson* and
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Oregon State University

An industry tour organized by agriculture leadership students has been a huge success within our college, and has grown remarkably over the recent years with support from the college, industry, and sponsors. The tour provides benefits through industry connections, networking, and exposure to the many areas within the agricultural industry. We focused specifically on personal and professional development, and providing purpose and relevancy through verbal and written reflections, as well as pre and post assessments of perceptions and attitude. A student leader in the college of agricultural sciences coordinated the first agricultural industry tour (1995), which has provided long lasting benefits to our students for the last 20 years. Students who participated in the industry tour benefited by experiencing new sectors of agriculture they had not previously encountered. Participants appreciated that the tour lends itself to a wide segment of agriculture. For instance, a recent graduate, stated, *"...on the tour, we were able to witness aspects of the agricultural industry. ...I am able to use what I witnessed on the tours and, as a result, relate better to topics that I would have otherwise been unfamiliar."* Future plans for the industry tour are to maintain the impact and value, while increasing the exposure and importance of this tour for students, industry collaborators, and the agricultural industry. This unique tour shapes the career development of students and promotes lifelong learning.

211

Developing Robust Mentoring Relationships in a College of Agricultural Sciences Leadership Development Program

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Research indicates postsecondary students benefit from mentoring relationships. However, there is a dearth of literature exploring the components of meaningful leadership-focused mentoring relationships between students and faculty. Our research objective was to identify

2015 NACTA Abstract Oral Presentations

characteristics of mentoring interactions that resulted in effective relationships and high personal engagement on the part of the student. We collected data using semi-structured interviews with 18 undergraduate students enrolled in a competitive, yearlong leadership development program housed within a College of Agricultural Sciences. Each of the 18 students was paired with a faculty mentor as a component of their involvement in the leadership development program. During the interviews, students described interactions with their mentors, including frequency of meetings, topics discussed, lessons learned, and intentions to pursue mentoring in the future. Exploratory analysis of the data revealed consistent themes, which supported categorization of mentoring relationships on two corresponding continua: ineffective to effective relationships and low to high personal engagement. We identified four quadrants to categorize these 18 mentoring relationships and labeled them a) Ineffective (low relationship, low investment), b) Stimulator (low relationship, high investment), c) Friend (high relationship, low investment), and d) Robust (high relationship, high investment). We categorized five of the 18 student-faculty mentoring relationships as Ineffective, two as Stimulator, six as Friend, and five as Robust. Our discussion will further describe the characteristics of these four categories and suggestions for facilitating effective mentoring relationships, which we assert should be a goal of all leadership development programs that include a mentoring component.

212

Technology Use in Post-Secondary Agricultural Sciences Classrooms: What Does the Research Say about Instructor Implementation of Educational Technologies?

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Instructional technologies, such as simulations and animations, have become more ubiquitous in higher education. Although the visibility of these tools has increased, less is known about the ways in which instructional technologies are integrated by faculty with pedagogy and specific course content in the postsecondary classroom. The extent to which agricultural sciences faculty integrate technology in their teaching can be described by the technological pedagogical content knowledge (TPACK) framework, which is an extension of Schuman's pedagogical content knowledge framework. However, little is known about the ways in which agricultural sciences faculty combine instructional methodologies

(e.g. Peer Instruction or Just-in-time Teaching) with digital tools (e.g. computer simulations or molecular animations) in their courses as well as the benefits to students' learning as a result of technology-enriched learning environments. We apply the TPACK framework to the existing agricultural sciences education literature to describe fully how faculty use technology to teach undergraduate courses as well as identify gaps in how digital tools are being used for agronomy instruction. Preliminary meta-analysis of the agricultural sciences literature using the TPACK framework reveals an emphasis on developing the computer and web-based technology literacy of students, while less attention is given to the use of technology by faculty for enhancing student understanding of discipline-specific content.

213

Effective Teaching on My Mind: How Do Peer Evaluations Contribute to the Assessment of Faculty Teaching?

Wendy J. Warner*, Joy E. Morgan, Travis D. Park, Daniel H. Poole and Charlotte E. Farin
North Carolina State University

While teaching is an important component of the tripartite mission at North Carolina State University, there seems to be limited emphasis on its value. Other research recognizes that universities have struggled to identify and reward good teaching. Historically, the evaluation of teaching has depended heavily on student evaluations of a course. However, concerns exist regarding low response rates and spurious factors that influence student evaluations. As a result, peer evaluation has also been utilized to provide an assessment as to the quality of faculty teaching. Yet, questions remain as to the process used across departments, colleges, and universities for peer evaluations of teaching. Also, there is uncertainty as to the level of importance placed on these evaluations when considering the quality of teaching in promotion and tenure decisions. The peer evaluation processes in seven of our peer institutions were more closely examined by reviewing the requirements for peer evaluations in the promotion and tenure process. The requirements and guidelines for peer evaluation of teaching were murky at best. Documentation required for evidence of peer evaluations ranged from a letter or report to a brief description of one to two paragraphs. Three institutions specified the review of syllabi, course documents, and instructional materials to be a part of the peer evaluation process. This presentation will provide more detailed information on the variation of the peer evaluation process used at institutions and

2015 NACTA Abstract Oral Presentations

suggestions for different forms/criteria that could be used in peer evaluations of teaching.

214

An Experiential Learning Approach in Food Science: Improving Students' Critical Thinking Skills

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My philosophy on integrating lecture material with hands-on laboratory experiences in Food Science, to reinforce fundamental concepts of the discipline, follows the intent of experiential learning instructional pedagogy. Experiential learning is of particular importance where phenomena are not easily observed, or else have little in common with relatable experiences. Such principles are commonplace in analytical chemistry, lending to the positive relationship between student involvement and comprehension. To that end, by providing a series of pragmatic real-world laboratory activities I can enhance the educational experience of the student. By teaching the basic concepts, showing them, and then allowing the students to apply the acquired knowledge through a hands-on exercise, my role has changed from simply disseminating the information to facilitating student learning. Beyond traditional laboratory exercises, students engage in the learning process with activities like physically acting out chemical principles and creating video teaching material for future classes. Via this approach, the experience forms the basis for observation and reflection. Better critical thinking skills develop and the student retains a deeper understanding/appreciation of the material taught. The objectives of the presentation are to describe my pedagogical strategies/approaches using experiential learning and to report on their successes to date.

215

The Campus Kitchens Project: Unique Opportunities for Colleges of Agriculture to Engage Students in Meaningful Community Outreach Efforts to Fight Hunger

Tammy Stephenson*, Amanda Hege and Sandra Bastin
University of Kentucky

The mission of the national Campus Kitchens Project (CKP) is to recycle food, provide meals, educate and

engage with the community, and provide leadership opportunities for students. In 2014, The Campus Kitchen at the University of Kentucky (CKUK) became the 41st affiliate of CKP, becoming the first to be housed in a College of Agriculture. Sponsoring CKUK through the Department of Dietetics & Human Nutrition provides unique and high-quality engagement opportunities for students in programs throughout the College. During the first two months of operation, 200 student volunteers dedicated over 656 hours of service. CKUK recovered 865 pounds of prepared food from UK Dining and over 100 pounds of fresh produce from the UK Horticulture Farm. The collaboration with the UK Horticulture Farm, specifically the 30-acre organic farm run by students and faculty in sustainable agriculture, is one that could be replicated. This partnership allows for gleaning of fresh, local, and healthy produce that would otherwise go to waste. Student volunteers with CKUK use the fresh produce to prepare recipes for use immediately, or to be stored and served during the winter months. Kale, tomatoes, peppers, eggplant, and broccoli were recovered during the first semester of operation. The gleaned produce and other on-campus recovered food is distributed through community partners, including the Catholic Action Center, Hope Center, and the Lexington Rescue Mission. With one in six Americans experiencing food insecurity, innovative and impactful activities, such as CKUK, provide unique opportunities for agriculture disciplines to collaborate in meaningful community outreach efforts.

216

Using Jing™ to Improve Engagement in Online Courses

Shannon Arnold*
Montana State University

Online education requires special techniques in course design, instruction, communication, organization, and technologies to reduce transactional distance, or the space between instructors and students. Interaction is central to the social expectations of students. The inability for face-to-face communication, networking, and socialization can make students feel isolated. Jing™ is an audio/video technology that can be used to bridge the gap of transactional distance in online courses, while also increase the amount of learner-learner, learner-instructor, learner-content interaction. Jing™ allows video and images to be captured on screen and uploaded on a server to share with others; thereby improving visual and verbal communication. Jing was integrated into an online course over three years to increase online course engagement. Assignments required students to use Jing

2015 NACTA Abstract Oral Presentations

to record introductions, answer discussion questions, make presentations, and complete course evaluations. Student reactions to the use of Jing were positive in its ability to improve the social environment, student-student and student-instructor interactions, and add variety in instructional methods. This presentation will discuss the benefits and challenges of using Jing and provide examples of how instructors can use Jing to improve overall engagement. Feedback from students will be highlighted based on their perceptions and expectations for the use of this instructional technology.

219

Examining the African-American Perception of Agriculture: Views of Students Attending an 1862 Land-Grant Institution

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Shortly after the Civil War, the numbers of African Americans in agriculture began to dwindle. Although recently an increase has occurred in U.S. African-American farmers, overall numbers are low. With low African-American enrollment in agricultural-related fields, the drive to diversify the agricultural industry is becoming more important. This phenomenological qualitative study examined the lived experiences among nine African-American students pursuing an agricultural-related degree at an 1862 land-grant institution. This study's objective was to examine the essence of these students' lived experiences and how these experiences influenced their choices of college majors. Through individual interviews, participants related their experiences of being an African-American studying agriculture today. Six themes were found during this study: Positive experiences or influences drove decision to join agriculture; the desire for African-American students to create change strengthens the pursuit of an agricultural-related degree; historical hurts and lack of encouragement contribute to low numbers of African-Americans in agriculture; going back, creating programs, and early exposure for African-American youth can increase their involvement in agriculture; positive effects and perceptions experienced while involved in agriculture; and negative effects and perceptions experienced while involved in agriculture. Overall, the participants' experiences while involved in agriculture revealed how African-American history has affected the number of African-Americans pursuing ca-

reers in agriculture today. The results also identified new areas where research could be conducted to help promote diversity in agriculture. Learning the motivations of the African-American students choosing agricultural-related majors helped expose layers of nuance and complexity comprising this phenomenon.

220

Flipping an Undergraduate Capstone Course: Student Perceptions of their Experience in a TBL Formatted Course

OP McCubbins*, Thomas H. Paulsen and Ryan Anderson
Iowa State University

Team-Based Learning (TBL) is a teaching method that integrates a flipped approach and relies heavily on the use of small groups. TBL is a very active type of learning process that aids students in acquiring factual materials as well as in developing higher-level cognitive skills. The aforementioned benefits are initiated by implementing strategies to ensure student accountability for content delivered in a flipped scenario. The five step Readiness Assurance Process is integrated within TBL and includes; a) pre-class preparation, b) individual assessment, c) team assessment, d) appeals, and e) oral feedback. The purpose of this study was to gauge student perceptions of TBL integrated in a capstone course. An electronic questionnaire was distributed to all students enrolled in AgEdS 450, Farm Management and Operation for the fall of 2014 ($N = 57$). The questionnaire consisted of questions relating to student beliefs and attitudes about TBL. Students rated their experience working in a team highly ($M = 5.4$, $SD = .644$). We conclude that student experiences in a TBL formatted course are overwhelmingly positive for AgEdS 450 at Iowa State University. The process of flipping a course into TBL format is a time consuming process, and student satisfaction is an important component in the continuous revision of AgEdS 450. These conclusions have implications for higher education as TBL may provide a more engaging learning environment for students. Measuring student engagement and performance in a TBL course could provide meaningful insight on the methods benefits. Examining the effect of flipping other courses within Colleges of Agriculture to TBL would be beneficial as well.

2015 NACTA Abstract Oral Presentations

221

Integrating Team-Based Learning in an Undergraduate Capstone Course: Advice from Larry Michaelsen

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Iowa State University

Post-secondary educators are facing increasing pressure to incorporate more student-centered learning in their classrooms. Lecturing has been identified as the predominant form of teaching in higher education because of its ability to deliver information efficiently with a large number of students. The research argues that the lecture's major disadvantage is its passive nature. Active learning methods, from which flipped learning was derived, have become more popular in the delivery of modern curricula and rely heavily on a student-centered approach. While not a new concept, student-centered instruction is becoming a heavily researched topic. As of late, Team-Based Learning (TBL) has become a popular teaching method among many disciplines in post-secondary institutions. TBL is not a teaching method that can be incorporated with little preparation; it requires a complete rethinking of course goals and a serious commitment to utilizing learner-centered instructional strategies. The purpose of this qualitative study, that employed a semi-structured interview, was to contextualize the process of flipping the current, lecture-based structure of the AgEdS 450, Farm Management and Operation at Iowa State University to TBL format. Dr. Larry Michaelsen, founder of the TBL method, provided a detailed account on why he developed TBL, the structure of the teaching technique, and evidence that supports its inclusion in higher education. Specifically, Michaelsen identified how TBL components align with capstone course elements to enhance student application of course content to real-world problems, students being accountable and active in their own learning, and improved decision-making abilities within teams. Examining student performance is vital to the success of any teaching method.

222

New Program Development on My Mind: Creating an Agricultural Science Major from Scratch

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Creating a new two-year associate degree program in agricultural science from scratch can be a daunting task. The field of agriculture is so broad and varied that many academic focus areas could be offered, such as animal science, horticulture, poultry science, forestry, etc. Adding to the challenge is the charge for two-year colleges to meet the needs of local stakeholders by delivering academic programs that prepare students for existing career opportunities. Without some structured method of identifying appropriate program offerings a curriculum can easily become untenable; moreover it may be based on what an instructor prefers to teach rather than what is needed by industry. To determine program requirements, industry needs for a given geographic area must be identified and then curriculum developed to meet those needs. An efficient way we used to accomplish this is to identify industry needs by determining the sectors of agriculture with the greatest economic output in our geographic service area. Subsequently a curriculum framework was developed which was then vetted using a focus-group consisting of local stakeholders serving as our program advisory committee. Changes were made to the curriculum based on focus-group feedback and plans were established to evaluate the program annually to make certain the established coursework will properly equip graduates with the knowledge and skills needed to enter the career opportunities available locally. A model of the curriculum development process will be presented which may be useful to other programs that are creating a new program to meet student, community, and industry needs.

224

Experiential Learning through Student Farming at Five Colleges and Universities

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This study was conducted in the fall of 2013 as part of the researcher's leave for professional development. The purpose of this study was to determine how student learning is facilitated, documented, and assessed through farming experiences associated with specific higher education institutions. Qualitative research methods including content analysis (of websites and documents), informal interviews, observations, photographs, and videos were used. A case study approach was used to organize and analyze data and report findings. A purposive sample consisting of five campuses, including three land-grant universities and two liberal arts colleges, was selected. Specific programs visited were UGArden at the University of Georgia, Student Farming

2015 NACTA Abstract Oral Presentations

Enterprise at the University of Massachusetts-Amherst, Sustainable Food Systems at the College of the Atlantic, Cooperative for Real Education in Agricultural Management at University of New Hampshire, and the Farm and Food Project at Green Mountain College. Visits revealed enthusiastic students; a strong sense of student engagement; dedicated, collaborative faculty and staff; administrative support; communication within and about the program using social media; overall positive public relations; and a focus on the production of food rather than commodities. All but one program emphasized organic and/or sustainable production methods. The type and level of student engagement varied from volunteer to paid intern as well as work study employees. Reflective journals, formal reports, observations, and peer review were used as methods of assessing student learning.

225

Describing Students in a Team-Based Learning Context

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Team-based learning (TBL) is a small-group, active learning strategy that engages students with course material through a series of activities that begin with individual preparation, progress to team-based work, and include immediate feedback. While initially developed in a COBA, it is now widely used in medical education and the literature records little recent use outside that field. The methodology was introduced into two agribusiness courses at a regional university in the fall semester of 2012. Students were initially resistant to its implementation. Given this classroom environment, research is being conducted to determine whether students eventually prefer TBL to traditional lecture. A key part of this analysis involves the description of students with respect to how they view "satisfaction" in a course, how they consider peer accountability, and what they contemplate when articulating preferences to content delivery styles. The Team-Based Learning Student Assessment Instrument© (TBL-SAI), created by Dr. Heidi Mennenga, was administered in week 15 of a 16-week semester to students in Principles of Agricultural Economics (lower division), and Agricultural Sales and Consulting (upper division) courses in the fall semester of 2014. Final data will also include forthcoming results from spring 2015 sections. Preliminary results indicate that students are highly satisfied with TBL-managed courses, as all nine indicators showed above average satisfaction. They consid-

ered contribution-to-team measures as the most indicative of accountability to their peers. With respect to TBL versus lecture preference, students reported substantially less distractedness and higher retention as a result of TBL activities than lecture.

227

Have Student Knowledge Levels Changed? A Decade of Pretest and Posttest Comparisons across Agricultural Economics Courses in a Small State University Program of Agriculture

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Assessment of student learning is frequently measured by comparing pretest and posttest outcomes in both agricultural and non-agricultural courses. Assertions are frequently made that current students enter higher education with increased knowledge levels compared to previous years. A small, state university program of agriculture has compiled pretest and posttest scores for eight agricultural economics courses over almost a decade. The courses span all levels of the academic program from introductory economic theory to senior level courses focused on each major agricultural economics field. Test instruments utilized over the period have been equivalent to comprehensive final exams for the respective courses. If the hypothesis is true that student knowledge levels are increasing, pretest scores for students in these courses would be expected to be climbing along with corresponding posttest scores. A statistical analysis of 1200 test scores from 2006 through 2014 showed that five courses had lower averages in 2013-14 than in 2006. Posttest scores over the same period indicated that five courses had higher averages in 2013-14 than 2006. Combining pretest and posttest results, the point gains by course in 2013-14 exceeded gains in 2006 for five of the eight courses in the cohort. Trend line analysis provides additional insight into possible knowledge level changes, both overall and by specific course. Precise assessment of the knowledge levels of agriculture students at all levels of their academic program can better enable schools of agriculture to adjust their curriculum programs, especially basic core courses taken as introductory prerequisites by all students.

228

Comparing Senior Agriculture and Non-Agricultural Student Valuation of Communication and Critical Thinking Experiences

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Program outcomes for colleges of agriculture graduates emphasize the development of strong communication and problem solving skills. The purpose of this study was to determine if senior agriculture ($N=144$) and non-agriculture students ($N=1056$) differed significantly ($p < .05$) in their perceptions of academic and personal development experiences. Data were obtained from responses to the 2013 National Survey of Student Engagement administered at the University of Arkansas. Using a Likert scale of 1= very little to 4= very much, students rated the extent to which their educational experiences contributed to knowledge and skill development in 10 areas. For both groups combined, mean scores ranged from 2.69 ($SD = 1.00$) for the outcome, "become an active/informed citizen," to 3.27 ($SD = 0.78$) for the outcome, "think critically/analytically." Agriculture seniors rated the outcome, "acquire job-related skills," significantly ($p = .0113$) higher ($M = 3.16$, $SD = 0.82$) than did non-agriculture seniors ($M = 2.95$, $SD = 0.95$); however the effect size for this difference was small (Cohen's $d = 0.23$). There were no other statistically significant differences in outcomes. The findings indicate that agriculture seniors value these experiences similar to non-agriculture seniors, but additional study is needed to explain the high variability. The experiences that contribute to "being an informed and active citizen" should be studied further as this was the lowest rated variable for both groups.

230

Comparing Traditional and Flipped Approaches to Teaching: The Case of the Reflections on Fighting Hunger Course

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University of Georgia

An inverted or "flipped classroom," adopts a teaching process design in which students review content prior to class, allowing for a classroom dynamic and environment where active learning, problem-solving, and inter-

action among instructors and peers is the norm. In a "flipped classroom" students review manageable content by themselves, but address problems and the more difficult concepts with the instructor readily available to engage and mentor them. While many people accept that "flipping" a classroom could enhance both student engagement and learning, data-based research is still in its infancy. Some criticisms of current scholarship exalting the value of flipped instruction include the following: 1) most assessments are anecdotal, single-shot case studies; 2) impact is seldom assessed with evaluation of learning, but with student self-reports or ex-post-facto observation-based assessments; 3) when controls are used, these are with non-equivalent student groups, do not take into account student self-selection, and are with courses that differ much more than in the "flipped" treatment; and 4) comparisons in learning and impact do not take into account differences in amount of time and effort outside of class invested by students. This project includes an in-depth review of experiences with "flipped" classrooms and analyzes their implications and applications for teaching and learning in agricultural sciences. The researchers will also present the curriculum and evaluation tools developed for a research project that compares the impact on student engagement and learning between traditional and flipped approaches to teaching in two versions of the "same" course, "Reflections on Fighting Hunger," taught during the same semester, by the same instructor, and under similar conditions.

231

Effectiveness of a Post-exam as a Learning Aid

Lee G. Wood
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Students spend a considerable amount of time preparing for exams, but often fail to reflect on information or discuss it afterwards. This study was conducted to assess student perception of the effectiveness of giving a post-exam, to be taken in small groups organized by the instructor. Three exams were scheduled throughout the semester. Post-exams were not announced, but always given on the class period following the original exam, after it had been graded, but not yet returned. The post-exams were optional, and a small amount of extra credit was possible. Students were put into groups based on performance so each group had a similar score distribution. At the conclusion of each semester a survey to assess student perception was available for voluntary completion. The survey was issued at the end of five semesters (Fall 2012-14) in two different courses. A total of 106 students completed the survey. Over 90% of stu-

2015 NACTA Abstract Oral Presentations

dents agreed that post-exams helped them learn the material better. About 85% of students agreed that the post-exam was an enjoyable experience. Only 21% of students reported that they would only participate in a post-exam if there was the possibility of extra credit. Doing a post-exam requires a commitment of time and resources. As well as committing valuable class time, a considerable amount of thought and time must be invested by instructors to prepare for the experience. However, student responses indicate that providing an opportunity for students to take a post-exam in groups can be a valuable teaching tool.

238

Realized Student Learning Outcomes in an Experientially-based Management and Marketing Course

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This descriptive mixed-methods study explored the learning outcomes in an experiential livestock management and marketing course in which students were allowed the opportunity to manage a university livestock farm. The objectives of this study were to 1) identify the realized learning outcomes of the course; and 2) analyze levels of learning outcomes within the frame of Bloom's Taxonomy. This two-stranded approach to data collection used an electronic survey to inform a later round of focus groups. Emerging themes included experience in agricultural systems, agricultural business, record keeping, livestock production, agricultural product merchandising and advertising, and agricultural decision-making. The results highlighted an unexpected breadth of experiences across nearly all sectors of a post-secondary agriculture curriculum. Nearly all students reported having had one or more significant realizations in which they made connections between agricultural fields which they had previously thought to be unrelated. Equally as unexpected was the lack of depth reported by many students on topics related to specific livestock management experiences. When asked about topics within the knowledge domain, a number of students were unsure of their answers, and unable to explain how the knowledge related to their experiences in the course. Conversely, when asked about topics within the application, analysis, and synthesis domains, a majority of students were able to articulate concepts specifically and correctly. The results suggest that this course, and other similar courses, have potential as capstone or upper-level courses, but may pose challenges when students have not previously been exposed to relevant knowledge.

241

Is a Traditional Drawing Exercise for Plant and Seed Identification Still Effective for Millennial Students?

Marshall Hay and Kevin Donnelly
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As progressive educators, it is important to offer various learning tools to facilitate different learning styles. While a host of new strategies are available with modern technology, an older, traditional approach was reintroduced into the Plant and Seed Identification class at Kansas State University. To help students identify a list of 225 crop and weed plants and seeds, drawing exercises were used to complement other current learning options available. The objective was to assess the drawing exercises in terms of student performance, perception, and ability to enhance identification skills. Students were asked to sketch key plant and seed structures with the naked eye and under a hand lens or dissecting scope during class study time. Quality of drawings varied widely. Drawings were rated, but grades were not assigned based on quality. Credit was given as part of a participation score that is 5% of the course grade. At first, many students were hesitant and self-critical of their sketching capability, but the majority participated regularly and evaluated the activity positively. Of 22 students in the class, those that actively engaged in the drawing exercises each week scored about 18% higher on weekly quizzes. Survey results indicated that 68% percent of students were "okay with" or "enjoyed" completing the drawing exercises, and 73% felt that reviewing their hand drawings were "somewhat" to "very" effective in preparing for weekly quizzes. Although several other tools were rated more effective, the drawing exercise seemed to provide a useful additional exercise that will be continued.

2015 NACTA Abstract Oral Presentations

243

Factors Associated with Pursuing Nutrition Careers and Increased Knowledge in Diverse Students

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Childhood obesity is a growing epidemic, and without appropriate workforce training/education, the epidemic may continue to escalate. The current study focuses on increasing the number of diverse students entering childhood obesity and nutrition-related pathways via developing a nutrition education curricula (integrating cultural context), and training undergraduate students. Using a quasi-experimental design, we assessed change in knowledge, and predictors associated with intent to pursue nutrition/childhood obesity-related careers in an intervention ($n = 66$) and control/comparison group ($n = 57$). An 82-item survey was employed and factor analysis yielded seven constructs: future careers in nutrition/childhood obesity, knowledge of childhood obesity and social influence, knowledge of childhood obesity and culture, general understanding of physical activity (PA), understanding of children's PA, knowledge of nutrition/obesity, and knowledge of foods and disease risks. The sample included 41% API, 33% Latino, and 26% NHW. Results indicate that after controlling for social class, GPA, and the number of units completed, the intervention group had significantly ($p < 0.05$) higher knowledge in all constructs post-intervention compared with the control/comparison group. Also, those who reported higher knowledge of cultural influence on childhood obesity were more likely to have interest in pursuing nutrition/childhood obesity careers ($p = 0.009$). Further, we found a significant ($p=0.02$) higher intent for Latinos to pursue nutrition careers that involve cultural factors related to childhood obesity. These findings have important implications of possibly including a curriculum focusing on the socio-cultural aspects of childhood obesity to increase the number and interest of diverse students entering nutrition-related fields.

244

Encouraging Learning and Leadership through Service Learning Projects

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Priority four of the National Research Agenda states that learners should be engaged in active learning environments, one that will prepare them for careers in the 21st century workforce. Results of several studies suggest that service learning does just that by engaging students in an experiential setting while promoting student learning, student development, and community engagement. The priority of a university is to prepare a student with the knowledge and skills that will be beneficial for a career; however, one of the underlying goals is to prepare a student who is engaged within their community. Service learning projects emphasize community engagement and leadership as well as meeting the objectives defined by the course curriculum. Within the "Teaching Diverse Learners" course, students not only gain the valuable skills related to working with individuals with special needs, but they also give back to the community through their efforts in teaching life skills through agricultural related projects. This service learning project is a joint effort with the Reality Center (program for individuals with developmental disabilities) and Governor Morehead School for the Blind. This presentation focuses on the implementation, results/benefits to date both for students and community, and how the overall process has increased student engagement and learning. While this particular teaching practice is designed for pre-service teachers, a similar service learning project could be implemented in any department. Educators are encouraged to step out of the classroom and create community based projects that align with course objectives.

245

Relevant, Real World Learning in Agricultural Marketing and Sales Course: Employing Experiential Learning Theory in Innovative Curriculum Re-design and Delivery

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Experiential Learning Theory (ELT) is built on 20th century scholars of human learning development, defined "to develop a holistic model of the experiential learning

2015 NACTA Abstract Oral Presentations

process and a multi-linear model of adult development.” An undergraduate Agricultural Marketing and Sales course employs ELT model as a dynamic approach for an innovative curriculum re-design and delivery. Scholars and educators attribute ELT approach to improve academic performance, skill acquisition and competency development. During a 15-week semester, students are organized into teams that work with a client to conduct rigorous research, then develop a marketing plan as a written report and oral presentation for an actual product, service, project or program. Projects have included developing a mobile-application for a global grain company, rebranding of the American Private Enterprise System youth program, a business growth strategy for a California based agribusiness, and a comprehensive plan for the repurposing and capital campaign for University of Kentucky’s Cooper House, the original farmhouse for the University experimental farm. Results have included students hired into full-time career and internship positions with clients, successful client implementation of student ideas, increased critical thinking abilities and capacity to connect marketing principles in real-world business applications. Limitations include a considerable increase of time required for course preparation and restricting class size for effective facilitation of experiential activities. Furthermore, teachers initially encounter student resistance due to a paradigm shift from teach-centered to student-centered instruction, requiring students to evolve from passive learners to active learners responsible for their learning experience and creation of knowledge.

246

Using Aerial Drones to Increase Student Participation in an Agricultural Video Production Course

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During the fall of 2012, the Department of Agricultural and Consumer Sciences at Tarleton State University purchased the first of two aerial videography platforms consisting of a multi-rotor aerial drone and compact HD video camera. The use of aerial drones for non-commercial videography is currently regulated by the Federal Aviation Administration (FAA) under guidelines developed for model aircraft; however, new regulations are being developed. With the increased availability of these systems, and the continued transition away from traditional media, Tarleton’s Agricultural Communication program faculty began to incorporate the system in a

new capstone agricultural electronic field production course. Introduction of the drone was initially met with skepticism from students; however, after training and hands-on experience with the equipment, students began to request the platform for use in their projects. The initial video projects containing aerial footage were rough, but served as a successful proof of concept for the usage of aerial video drones in a structured video production course. A primary deficiency with the first drone was the lack of vibration reduction and stabilizing camera gimbal. To address this deficiency, a second drone was purchased that incorporated the gimbal and vibration reducing camera mount. Video captured with the new system have exceeded expectations. Students enrolled in the video production course are now able to produce broadcast quality projects showcasing their proficiency with both traditional and aerial videography.

249

Making Agriculture Relevant: Categorizing Texas Consumers’ Food-Related Knowledge, Attitudes, and Behavior

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A synthesis of agricultural literacy articles published between 1988 and 2011, suggests that only six studies addressed agricultural literacy among non-educator community members. Audience characteristics play a major role in how individuals consume and process information; people are more likely to attend to messages tailored to them and their beliefs, attitudes, and behaviors. To provide relevant information to consumers regarding U.S. food and fiber production, agriculturalists require an understanding of the audiences to which they are trying to communicate. This study’s purpose was to describe the perspectives of agriculture among individuals in Texas. To this end, researchers conducted focus groups and personal interviews at farmer’s markets in central Texas. Data were analyzed using the constant comparative method, which determines similarities and differences by comparing one data segment with another. Reflexive journals and group debriefings established confirmability and credibility. Six categories were defined: traditionalist, health-conscious, indifferent, opinionated learner, and organic believer. Traditionalists are active agriculture participants who grew up in the industry. Health-conscious individuals know where their food comes from and how it was made; they avoid highly processed foods. Indifferent consumers put little thought into food choices and ignore agricultural information.

2015 NACTA Abstract Oral Presentations

Opinionated learners seek information online and develop strong beliefs based on their research. Finally, organic believers focus on environmental health and decry the use of pesticides. Although limited in scope, this categorization provides a useful starting point for developing agricultural messages aimed at adult consumers.

253

Video Ethnography: An Approach to Collecting, Archiving, and Sharing Data and Results

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No matter how rich a description is or can be, there will always be distortion when interpreting data and then presenting findings to an audience who was not part of the research process. Consumers, including scientists, are sometimes skeptical of qualitative approaches to inquiry. Perhaps more importantly, stakeholders—especially in industry and the public—may question researchers' credibility when they receive reports in a narrative form. Video ethnography provides a mechanism to collect, archive, and share qualitative data and results in a manner that is more understandable and relatable to lay-consumers and transparent (and arguably believable) to those outside the research process. In 2014, student researchers at Texas A&M University used video ethnography to immerse Star of Texas Rodeo's board of directors in attendees' experience at Rodeo Austin. Video ethnography allowed investigators and consumers to engage with and involve themselves in the investigated context, enriching both the research process and audiences' understanding of findings and implications. The video ethnography process enabled students to design, conduct, and disseminate research in a way that increased their credibility with their client and allowed for greater transparency to all stakeholders. Perhaps more importantly, data presented through video were generally believed to be more engaging than data presented in a traditional narrative form.

257

Linking Leadership Development to Successful Community Engagement in the Tropics

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Developing leadership skills while participating in a study abroad trip can be challenging yet rewarding for both the students and faculty. In order to link leadership development to community engagement one needs to take into account not only the age of the students but their academic background or interests. It is very important to understand the students' demographics but also it is very important to relate these interests to community engagement to help demonstrate new themes or areas of leadership that can help apply learning in the context of the situation abroad. Service learning models are often employed for student to have a community engagement project. In the case of this teaching study, 14 students (from both 4-H and FFA) were given the chance to not only engage first with EARTH University students but also got to engage directly through hands on learning with community tourism projects called PeopleFirst Tourism. At the end of each tour, the students were able to reflect on their experiences and their interactions and identify leadership characteristics of their traveling classmates but also those of the community members. The reflections lead the trip leaders to believe that not only is it necessary to prepare the students but also to prepare more the traveling trip leaders who lacked an understanding of how to be demonstrate leadership without hindering the students perceptions. Generally, students valued the experiences gained however; they wanted more face-to-face time with community without limitations.

260

Impact of Learner-Centered Syllabus Design on Comprehension and Retention of Course Information

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The course syllabus is usually the first item that students are exposed to but often the last faculty consider in the process of course development. While syllabi can serve important purposes to administration, faculty and stu-

2015 NACTA Abstract Oral Presentations

dents, many faculty view the syllabus as the contract between instructor and student and develop it as such. Traditional syllabi may be passed between instructor generations and include standard categories, plain wording, and teacher-centered language in brief statements. Learner-centered syllabi contain similar categories but are framed to focus on student needs and their learning process. They serve as a student success portal through communication of course purpose, learning objectives, student responsibilities, and class policy; all established with a friendly tone, “warm language”, and even visuals. This study explored the impact of a learner-centered syllabus design on students’ comprehension and retention of course information during a one semester core agriculture requirement at a regional teaching university. An independent-samples t-test was conducted to compare syllabus information retention in two sections of an agricultural economics class. There was not a significant difference in the syllabus scores for the section one ($M=0.67$, $SD=0.15$) and two ($M=0.63$, $SD=0.17$) syllabus treatments; $t(59)=1.00$, $p=0.318$. These results suggest that designing and presenting syllabi in a learner-centered manner does not seem to have an effect on students’ information retention. Specifically our results suggest that including student-centered language, colored text, and visuals in the syllabus does not help students comprehend and retain information more than the traditional alternative.

261

Learning through Story: Using Narrative Inquiry in a Graduate-Level Food Security Course

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We illustrate the framework, process, findings, and learning outcomes of a narrative-based research project undertaken in an interdisciplinary graduate course on food security at Virginia Tech. The Food Security and Resilient Communities course was developed as a curricular aim of the Appalachian Foodshed Project (AFP), a 5 year USDA AFRI funded project that addresses issues of community food security in West Virginia and the Appalachian regions of North Carolina and Virginia. Drawing upon the methodology of narrative inquiry, the AFP is crafting “practitioner profiles” as stories of community food work that come from the practitioners themselves who are eager to share their stories of practice

with each other. Objectives for this presentation are three fold. First, we share how this course used the AFP narrative inquiry approach to develop new practitioner stories focused on the community development work of food security in the region. Next, we explore student-derived findings and subsequent learning experiences based on this story-telling research method. Finally, we offer collective insights for using narrative inquiry as a learning tool for student, teacher, and community audiences. This session will therefore illustrate three outcomes: how this innovative teaching approach enabled students to conceptually and practically apply in-depth research skills; how the students were able to personally and professionally explore the complexities of community food security as a critical and scholarly opportunity; and how the narrative inquiry approach engaged students in a way that humanizes the “wicked problems” of our food system to create new possibilities.

264

Place-based Research as a Tool to Achieve Science Literacy into the Classroom

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In place-based learning, students achieve learning outcomes outside of the classroom by interacting with community members and other local resources. Students learn first-hand how research can be applied to address problems in their own communities and answer questions that can help the future of agriculture. Place-based learning creates awareness of agricultural sciences as a viable degree and career option and improves student participation, of particular importance in minority communities. A new place-based learning initiative at Leeward Community College is providing students in horticulture and biology the opportunity to conduct scientific research. A case study will be used for this presentation, which shows how place-based research promotes student engagement. During the fall 2014 semester, students completed a basil variety trial in collaboration with an organic seed company, researchers, extension agents and farmers. Students evaluated 12 varieties of basil for growth and resistance to downy mildew, a disease that negatively impacts Hawaii’s basil production. Resistant basil varieties offer a potential way to combat the problem. Of the 12 varieties trialed by students, three showed significant resistance to downy mildew. A conference was organized to disseminate results and bring together the student researchers with faculty, farmers, and agricultural professionals. Students who participated in the research project rated the experience as very val-

2015 NACTA Abstract Oral Presentations

uable and expressed the benefits of connecting with local resources, which creates opportunities for transferring to four-year programs, graduate school and getting jobs. Future activities are planned to expand on this initial success by offering more classes the opportunity to incorporate research into their curriculum.

269

GoFarm Hawaii: Developing an Online Curriculum to Train Beginning Farmers Statewide

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Hawaii has the distinction of being the most isolated populated landmass in the world and imports more than 85% of its food, thus is highly vulnerable to disruptions in import supplies. Increasing food security in the state requires that a new generation of farmers be fully prepared to replace aging farmers who soon will retire (currently, the average age of farmers in Hawaii is 59 years). In 2012, a new-farmer training program, consisting of four increasingly intensive phases spanning nearly a year, GoFarm Hawaii, was developed to provide aspiring farmers the skills and knowledge necessary to become successful agricultural entrepreneurs. The success of GoFarm graduates has led to the expansion of that initiative to three GoFarm Hawaii training programs in the state of Hawaii. To ensure quality and consistency across the multiple GoFarm training programs and to maximize instructional efficiency, GoFarm Hawaii has developed online modules to be used across the state. GoFarm Hawaii's online modules are a robust curriculum that includes guest lectures, maintenance, and practical field demonstration videos. An interactive practice activity has been added to aid student recognition of common plant ailments, and a discussion board has been incorporated to allow students to support each other's learning, and to interact across training sites.

272

Graduating Seniors' Perceptions of College and Departmental Services

Murari Suvedi and Ramjee Ghimire
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Colleges and university departments provide academic services such as career advising, study abroad, academic advising, and guidance about volunteering, internships, job search, etc. These services have signifi-

cant impacts on students' learning and job placements. Timely feedback from graduating seniors could be very valuable to academic administrators such as deans, directors and department chairs. Therefore, online surveys were conducted among graduating seniors in the College of Agriculture and Natural Resources (CANR) at Michigan State University from 2009-10 to 2013-14. The goal was to assess students' perceptions of various college and departmental services. The survey was administered online to seniors prior to fall and spring graduation. Altogether, 1,534 graduating seniors participated in the survey. Findings revealed that the majority of graduating seniors positively perceived college services -- they indicated that information and services related to academic matters, career advising, and study abroad were valuable. The career consultant was helpful in providing tips on interviewing skills. Students' perceptions of college services did not differ by their demographics. Perceptions of departmental services were also very positive—quality of advising and information on internships were highly rated by respondents. Perceptions of departmental services differed by students' gender and age, with higher ratings from male and non-traditional students. Findings implied that academic departments could serve their students better if they offered more opportunities for real-life experiences through shadowing and experiential learning, internships and volunteering; information on job markets through orientations, career counseling, and career fairs; and tips and help in preparing for interviews.

276

Bringing it All Together: Examining the Role of Capstone Courses in Cross-Disciplinary Academic Programs

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Academic capstone experiences have the potential to create a context for students to make meaning out of seemingly disparate academic experiences, providing an environment for deep and intentional learning. The use of a curricular model that employs this approach is critically important in those academic programs that emphasize cross-, inter-, and trans-disciplinary learning outcomes to enhance students' ability to recognize philosophical, analytical, and practical connections. This presentation will highlight research on the effects of capstone experiences on undergraduate student learning within cross-disciplinary academic programs. The authors provide a case study of a large, Mid-Atlantic, re-

2015 NACTA Abstract Oral Presentations

search-intensive, Land Grant institution's use of capstones within the curricula of intercollege academic minors. Intercollege minors at the institution afford the opportunity for critically important, boundary-spanning, cross-disciplinary education for undergraduate students, grounded in disciplinary excellence, scholarship, and practical wisdom. The multiple disciplinary connections and intersections of the capstone afford the potential to foster a deep understanding of the topical focus of the intercollege minors. The case study will incorporate preliminary quantitative and qualitative data from online surveys and key informant interviews with undergraduate students who have scored their own capstone coursework on a continuum from most negative to most positive. The presentation concludes with recommendations for intentionally designing capstone experiences that will best enhance student learning.

277

Service-Learning to Promote Edible Insects

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Worldwide, most of the human population consumes insects as a regular part of their diet and thousands of edible species have been identified. However, in the western world mass media has often negatively influenced the public's perception of insects by creating or reinforcing fears and phobias. Eating insects (entomophagy) for nutrition is not imperative in the U.S. where many food options are available and there is still an attitudinal barrier to the use of insects as human food. Where entomophagy is not prevalent, food choice and food habits are the driving forces of acceptance. In the U.S. in the last 3 years, insects have become an emerging alternative protein source for humans. Numerous insect-related food companies and human-grade insect farms have been created. Service-learning is a pedagogy that bridges theory and practice, focuses on reflection and sustainability, is linked to the curriculum and is mutually beneficial for students and their community partners. UGA Entomology is promoting edible insects through service-learning courses. Edible insects are being incorporated into many of the entomological educational events including Insectival, the Insect Zoo Open House, Octobeefest, and The Beers and the Bees. These service-learning programs generally attract thousands of people and are a wonderful opportunity to introduce the idea of entomophagy in Western cultures.

279

Effectiveness of an Experiential Agriculture Program with At-Risk Hawaiian Teens

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Mentors guided at-risk youth as they planned, built, managed and marketed a 1/10th acre farm. Thirty high school students (at-risk for school failure) participated across a two-year period. Staff developed and taught a 10-unit agricultural sciences curriculum, with lab and field-science activities. Youth attended one afternoon a week, for 5 hours. They harvested and prepared CSA baskets, cooked a meal from farm produce, attended a conceptual lecture, completed lab and field-science activities and ate dinner while meeting in small groups. Each mentoring group: managed one segment of the farm; produced 1-2 baskets per week; and conducted and presented a group research project. Instructors taught soil science, botany, plant propagation, hydroponics, integrated pest and disease management and microenterprise business, at the college-entry level through lecture, lab and hands-on activities. Results: Teens showed significant increases in scores on unit post-tests for each of the 10 conceptual units (p is less than or equal to 0.05), indicating increased understanding of scientific concepts and organic agricultural best-practices. They showed significant increases (on pre- to post-checklists) in hands-on skills in carpentry, soil preparation, plant propagation and care, hydroponics, cooking, and group leadership. Pre- and post- parent questionnaires showed statistically significant increases in teens' school grades, interest in pursuing science in high school and college, college applications, hands-on skills and self-confidence and initiative.

2015 NACTA Abstract Poster Presentations

008

Publishing Graduate Class Projects: Advantages and Potential Pitfalls

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Graduate students are rewarded with better job opportunities if they can demonstrate a productive publishing record; yet, most graduate programs provide limited opportunities for co-authorship on publications beyond thesis and dissertation research. This paper reviews an experimental writing program where technical publications were generated in a discipline-based graduate class. Seventeen students who had successfully published their group projects were interviewed to better understand elements of the experience which influenced their professional development. For many students, the most powerful experience was working as member of a research team. Master's students benefited from experiencing research and later being able to transfer this new knowledge into their thesis programs. Doctoral students were challenged to stretch the definitions of their disciplines and to learn new research methods. Semester length was a serious challenge when integrating a research project within a class environment, resulting in less discipline-specific content being shared during class time. Overall, as each group of students worked through the project, they developed their own rules for how to successfully work as a team member and this was the most important lesson learned through participation in the class-authored publication.

009

Listicles: A Different Platform for the "Term Paper"

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Many courses make use of a "term paper" to encourage synthesis of course and outside information and emphasize communication skills. While these are important goals, term papers do not engender much student enthusiasm, can be a challenge for instructors to grade, and do not emphasize translation of material to non-

scientific audience. Therefore, in an upper-level animal growth and development course, term papers for graduate and honors undergraduate students were replaced with listicles on a topic of the students' choice. Listicles are articles, often published online, arranged in lists. Students were instructed to include five items on their listicle, citing sources for three items. Listicles were to include at least two pictures and be posted online. All 25 students who submitted listicles used Buzzfeed, a free website, to publish their articles. Links were aggregated using a visual bookmarking site (Pinterest). All students reviewed the listicles and voted on their favorites. Topics chosen were wide-ranging, from animal nutrition and health to human diseases and conditions, though all made connections to course material. Student response to the assignment was very positive including comments like "Listicle project was unique and a nice change from the run-of-the-mill paper". In general, the listicles were very engaging as students were invested in their choice of topic and competing for the attention of their classmates, making grading enjoyable. In the future, the instructor will disallow the use of review articles for the three cited sources to engage students more thoroughly in the scientific literature.

011

Assessing Agricultural Student Understanding of Entrepreneurship Skills: Implications on How to Teach Entrepreneurship

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Agricultural colleges have always been involved in entrepreneurship from the earliest days of the creation of the land grant system. The combination of teaching, research and outreach has stimulated the pursuit of innovation in agriculture and has led to great advances in the agricultural industry. One area where this has been evident is in the area of agribusiness education where departments seek to train students to recognize opportunities and trends that lead to positive business impacts for the industry. Many people assume that agribusiness skills are the same as entrepreneurship skills. A quick review of the literature shows that there are divergent views on what is meant by the term entrepreneurship, and very limited research on teaching entrepreneurship in agriculture programs. This project developed a baseline of student understanding of entrepreneurship and determined if the current agriculture program is success-

2015 NACTA Abstract Poster Presentations

ful in preparing students in the art of innovation and entrepreneurship. A survey was developed and administered to agriculture students covering four areas needed for entrepreneurship success. Student responses revealed that there was not clear understanding of the differences between business management and entrepreneurship training among agriculture students. Results also showed that student major and classification had an impact. Agribusiness and agricultural engineering students responded positively to the importance of entrepreneurship. However agribusiness student responses showed that they were unable to fully discern business skills from entrepreneurship skills. As a result, the agribusiness program content needs to be updated to provide clear training in the area of innovation and entrepreneurship.

012

Integrating Solar Photovoltaic Technology into Agricultural Education: Benefits & Implications

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New technology integration into existing course curriculum has benefits, challenges, and implications. The successful integration of solar photovoltaic technology into existing course curriculum in agricultural education is a result of several variables, including professional development experiences for the instructor, acquisition of necessary tools and materials to teach concepts in the course, implementing hands-on activities to engage students, providing outreach opportunities for university students to transfer their learning experiences, and partnering with industry to grow the experience and provide future career opportunities for university students. Online courses and hands-on workshops with a renewable energy non-profit (Solar Energy International, SEI) was the source for instructor training. Over a two-year period, the instructor successfully completed the Solar Professionals Certificate Program, and is preparing for the National Board Certified Energy Practitioner (NABCEP) examination for entry-level PV installers. Renewable energy-related grants (UA Green Fund, USDA Western SARE) serve as a funding source for acquiring tools and materials for classroom and laboratory instruction. Laboratory activities include multiple solar water pumping activities, a demonstration ground-mount solar array station, a battery-based solar lab station, and field trips to university research stations to observe how a grid-tied solar array is used to offset the deep well pumping costs for irrigating field crops. Students are provided opportunities to use digital multi meters to measure circuit voltage and

amperage output of solar modules. Providing outreach opportunities for university agricultural education students to teach solar photovoltaic concepts to high school agriculture science students and engineering students

015

International Student Organization: Excellent Partners for Global Learning in Agriculture

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In the past 15 years, the number of international students on U.S. campuses has increased by 72%. International students bring diversity of perspectives to campus, which could be shared with domestic students to facilitate global learning. International students remain an underutilized global learning resource on many campuses. By creating a space within formal learning experiences to give international and domestic students the opportunity to interact; instructors have observed the development of global competency skills like intercultural communication. An interdisciplinary group of practitioners and researchers worked together to identify opportunities for meaningful engagement of international students in multiple courses from freshman orientation and senior seminars as well as into student organization and secondary student recruiting and outreach. Best practices have been identified to be shared with others in a collaborative setting. Without appropriate and purposeful preparation and implementation, there is the risk of superficial experiences between domestic and international students which can induce negative feelings. Best practices in overcoming logistical challenges and results from non-formal interviews and focus groups with international students identifying barriers to involvement will be shared. Some domestic students have been hesitant to engage in activities, yet while the experience progresses they enthusiastically engage. International students have commented that they "love to share their culture" with domestic students and are quick to volunteer for future activities developing meaningful partnerships. This is a specific strategy that colleges and universities can implement at low cost to impact global competency of graduates while improving quality of student life campus-wide.

2015 NACTA Abstract Poster Presentations

017

Global Teach Ag! Initiative: A Framework for Discipline-specific Global Competency Development

Daniel D. Foster and Melanie Miller Foster*
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With so many courses, study abroad options, student organizations, seminars and opportunities it can be difficult for students to sort through options to focus energies on relevant international opportunities that will help achieve their career goals. Stakeholders worked together with limited financial resources to create a service that leveraged university resources and capacity for learners in the discipline. The program developers believe the concept of coalescing resources around contextually relevant issues and presenting them in accessible discipline/professional language is a strategy that could benefit a wide range of agriculture disciplines. The Global Teach Ag! Initiative was created as a response to the issue of paralysis by analysis. The purpose of the initiative is to develop global competency of students in the Agricultural & Extension Education (AEE) major by identifying relevant global opportunities, creating original discipline-specific globally-focused programming, and providing a framework for contextually-relevant global learning outreach. Activities include a weekly email publication that highlights relevant global opportunities to AEE students, development of major-specific embedded courses, and discipline-specific global learning events. The initiative hosts special events designed to bring K-20 agriscience educators together to discuss how to embed global learning in agriscience programs at all levels of education. The Global Teach Ag! Initiative also promotes international undergraduate research through a structured research program. Students are encouraged to share their global learning and practice teaching skills through an outreach program designed to develop global competency in students enrolled in agriscience education at the secondary level.

018

Native Plant: What Does it Mean and Why Does it Matter?

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The term native plant is a popular buzzword in the nursery and landscape industry. Many growers use the term to develop niche markets for their products and many consumers' link native plants to sustainable landscapes. However, "native" is often defined in a number of ways and associated with a range of perceptions. A joint project between a plant propagation course at Kansas State University and a containerized plant production course at Iowa State University introduced students to native plants and explored the role of native plants in built landscapes and horticulture crop production. Several species of native plants were used as the model crops in both the propagation and production courses. Students completed a five-question self-assessment on their understanding of native plants at the beginning of the course and at the end of the course. Students also completed a 10-question pre- and post-quiz on native plant definitions, terminology, and use. Results showed gains in student self-efficacy relative to defining, native plants by the end of the course. Further, post-quiz scores increased compared to pre-quiz scores supporting student-learning gains.

019

"Flipped Internships:" One Way Arizona Grows a Diverse Agriculture Workforce

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Many universities and colleges teaching agriculture offer internships to upper division undergraduate and graduate students as they near the end of their academic program. For some, it's a capstone course to demonstrate their knowledge and lab skills in real-world experiences and prepare for advanced studies or agriculture careers. South Mountain Community College "flips" internships and recruits high school students who may be undecided about their academic program, have little knowledge of agriculture, but have a passion for science. The purpose of SMCC internships is to inform high school students about myriad learning and career opportunities in agriculture as they gain experience solving local and global agriculture problems and to see the relevancy of their academic course work. In so doing, the internships strengthen student's commitment to pursuing and achieving agriculture degrees. The success rate for SMCC internships is 100%. Impacts of "flipped internships" are seen in the increases: in interns from 10 to 31 in three years; in research partners from one to five partners (including USDA/ARS, University of Arizona, a private biofuels startup, and City of Phoenix Parks & Recreation); in the number of research mentors from

2015 NACTA Abstract Poster Presentations

eight to twenty-seven, and in the number of high school agriculture programs from three to fifteen. Moreover, nearly forty percent of the interns are under-represented minority and this increases the diversity of our research partners and workforce. Though the USDA/NIFA grant that funds the internship program ends in August, Arizona research partners have committed funds for its continuation after the grant ends.

020

Team-Based Learning Outcomes in Agricultural Education: Developing a Survey Instrument to Evaluate Student Individual and Group Learning

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Agricultural industry representatives rank skills in communications, interpersonal interactions, and critical thinking among the most desired qualities for hiring recent college graduates. And while these “softer skills” are often more important than industry specific knowledge, imparting them in a traditional lecture setting is challenging, if not impossible. As college instructors adapt to meet these workforce needs new instructional strategies are required. One such strategy is *Team-Based Learning* (TBL). The TBL strategy shifts classroom learning from the passive lecture to active application of course content by student teams. TBL appears to produce “softer skill” learning outcomes, but evidence is mostly anecdotal. This study aims to develop a research-based survey instrument to measure desired student outcomes not otherwise evident on a student’s grade report, but previously observed anecdotally with TBL. We explore three overarching constructs within the TBL framework: 1) Attitudes and Beliefs about Learning; 2) Motivation to Learn; and 3) Professional Development. Preliminary analyses suggest favorable to strong reliability for all three constructs measured by the survey instrument. A new round of data collection began this past fall (Fall 2014) and will continue through spring 2015. Pre- and post- test scores related to the three constructs will be compared to assess student growth in these three learning domains. Findings from this research will be used by more than 20 TBL instructors to make data-driven decisions regarding the enhancement of TBL instructional pedagogy and ultimately improve student learning outcomes. More than 1100 students will be impacted by this project.

021

Stimulating Interest in Plant Sciences to Intermediate and High School Students of Windward Oahu

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A one-hour laboratory or field project was provided at Windward Community College to intermediate and high school students. 82 students in the following groups: 1. Waimanalo Intermediate, 2. Kalaheo High, 3. Kailua Intermediate, 4. Kailua High participated in the projects. Surveys were conducted after completing the session to determine the correlation among school groups, grade levels, lab or field project familiarity, previous experience in growing plants, and their interest in taking college plant sciences in the future. Group 1 and 2 performed poi making and vanilla pollination. Group 3 and 4 identified plants using dissecting microscope and prepared nutraceutical plant-based products. Seventy-four percent of Waimanalo Intermediate students are familiar with the field exercises; 22% have experience growing plants; 78% will take college plant science classes. Sixty-nine percent of Kalaheo High students are familiar with the field project; 50% have experience in growing plants but only 50% will take college plant science classes. Eighty percent of Kailua High students are familiar with lab exercises; 56% have experience in growing plants and 48% will take college plant science classes. Thirty-seven percent of Kailua Intermediate students are familiar with lab exercises; 100% have experience in planting and 63% will take college plant science classes. The highest interest in plant sciences is shown in students from Waimanalo Intermediate, an agriculture-based community. High school students’ lower interest in taking college plant sciences in the future is probably due to greater exposure to science and technology in general, and less emphasis on advanced plant sciences in their high-school course work.

022

Examining E-Extension: Diffusion, Disruption, and Rate of Adoption among Iowa State University Extension and Outreach Professionals

Cayla Taylor and Greg Miller*
Iowa State University

eXtension—America's Research-based Learning Network™—provides online access at www.extension.org to research-based information developed by Extension professionals from land-grant institutions nationwide. Understanding how eXtension is used and perceived among Iowa Extension professionals is key to providing a relevant and engaging environment for online learning. The purpose of this study was to assess the rate of adoption and perceptions of eXtension held by Iowa Extension professionals. The diffusion of innovations and disruptive innovation theories were used to guide the study. A census ($N=975$) was conducted using an online questionnaire. A final response rate of 44% ($n=429$) was obtained. Of the five adoption stages in the diffusion of innovations theory, respondents selected one stage that aligned with their current acceptance of the technology. Results indicated that one quarter of Iowa Extension professionals had no knowledge of eXtension, while only 15% of study participants indicated using eXtension in their work. Iowa Extension professionals had favorable perceptions of eXtension's relative advantage, accessibility, and capacity attributes, while the compatibility, complexity, observability, trialability, affordability, responsiveness, and customization characteristics were neutrally perceived. eXtension has not been adopted among Iowa Extension professionals as founders intended it would and has the potential to become a disruptive innovation based on Iowa Extension professionals' favorable perceptions of the accessibility and capacity attributes. Further research is needed to examine the perceptions and adoption of eXtension, particularly research using the disruptive innovation theory in Cooperative Extension and higher education environments.

024

If You Flip It, Will They Come?

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University of Florida

One teaching technique that is gaining popularity is that of "flipping" the classroom. The goal behind "flipping" the class is to provide recorded lectures to the students

ahead of time so that they might be watched by students outside of classroom time. Doing this allows classroom time to be utilized for discussion and other activities, such as group work. While there has been some research on the use of this technique, including some positive results, the question remains whether students will engage with the course lectures at the same level when presented online rather than in person. The objectives of this poster presentation will be to describe modifications made to "flip" a traditional course of 77 students, and provide information about outcomes. Metrics associated with video viewing will be presented to display usage across the semester, as well as information on course attendance. Qualitative information regarding student recommendations for future courses will also be obtained. Student satisfaction metrics, which will also be obtained in April, will be shared. Finally, a discussion of barriers and lessons learned will be shared.

025

An E-learning Feasibility Study: Perceptions of Undergraduate Agricultural Students

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The progresses in information and communication technology are opening up new opportunities in delivery of education for students at the universities. In other word, advances in ICTs can provide new opportunities in both learning different issues and creating well-designed, learner-centered, interactive, efficient, flexible E-learning environments. The purpose of this study was to investigate the feasibility of E-learning as an alternative way to conduct continuing education for Agricultural Education in Iran. A descriptive–correlation survey approach was used. A total of $N= 111$ agriculture students who were involved. A researcher made questionnaire was used to collect data. Reliability of the questions were first determined by a group of educational specialists and then validity of the questions were tested by using a Cronbach's Alpha ($\alpha=0.91$). Results revealed that 93.56 % of agricultural students agreed to implement an E-learning system. (23.52% = fairly agreed, 70.04%=entirely agreed). On the other hand, only 6.44% of the agricultural students have been disagreed to implement an E-learning system by negative attitude. An E-learning readiness evaluation can help identify potential aspects that can be used to achieve what its goals and to know where it should invest. E-learning is a feasible and valuable learning model that is worth making generally available to Agricultural fields. From our reasons analysis findings, we have confirmed that synchro-

2015 NACTA Abstract Poster Presentations

nous E-learning programs are a suitable method for Agriculture. But before that needs assessment is strongly recommended in the program preparation stage. This research has feasibility study on the implementation of E-learning for Agricultural in Iran. Results about student's attitude to use of E-learning showed that, they had positive attitude to use of E-learning in the university. The results from the feasibility indicated that the most important issues for implementation of E-learning were Educational issue. And the least important issue was technological factor. If E-learning is to have a meaningful role in higher education, it is important that universities should focus on students' attitudes and their expectations with regard to the role of E-learning within their higher education experiences. The results of the correlation among attitudes, average and age showed that there were a significant relationship. Between semester and attitude displayed different significant as well, but between degree and gender that were not any significant. Future studies should be conducted to investigate the influences of implementation factors that have been identified in prior adoption research on E-learning system usage outcomes.

027

Why Students Choose to Dropout from College of Agriculture at Razi University?

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Recent dropout rate among undergraduate students in College of Agriculture at Razi University in Iran has led to decreased enrollment. Therefore, this qualitative study sought to investigate the causes of college dropout as perceived by undergraduate students. Individual phone interview was conducted to collect data. An accessible sample of 101 dropout students during the past three consecutive semesters participated in the study. Individual phone interview data were inductively analyzed with the desire of discovering categories, themes, and/or patterns that would aid in the causes of student dropout. A total of ten themes emerged: A dull future for agricultural careers, lack of interest in agriculture, negative feedback from academic counselors, financial problems, weak social image for agriculture, agriculture as a male oriented discipline, family problems, lack of interest in pursuing education, lack of agricultural awareness, and wrong academic decision. The result of this study has practical implications for academic advisors. For example, advisors should engage students in more practical hands-on

activities if they are to increase the retention rate of agricultural students across the country.

029

Developing Well Rounded Agriculture Students: The Importance of Teaching U.S. Agricultural History

Jimmy Butler, Danny Walker, Jason Roberts and Joey Mehlhorn
University of Tennessee at Martin

In the past, most students who chose to study agriculture during college developed a desire to learn about agriculture early in life. Many first learned about agriculture careers through organizations such as FFA and 4-H and they have an understanding of the underlying history and importance of agriculture. Today, many colleges of agriculture are experiencing growing numbers of students who come from urban environments and have little knowledge of production agriculture or agriculture related groups. In order to develop well-rounded agriculture professionals it is important for them to understand how the agriculture industry has evolved over time. In 2013, an elective course in U.S. agricultural history was developed in a traditional agriculture program in the southeast. The course was designed to foster a broad understanding of the importance of agriculture and develop an appreciation for the systematic approach of how agriculture fits together. Undergraduate students were surveyed to determine the effectiveness of the course to improve understanding of how the discipline fits into the overall agriculture complex. Results showed that student understanding was improved through the course, but results did vary by discipline. Students in the agriculture education and business programs showed greater affinity for the material than traditional agricultural science majors. Issues of whether the course should be required also received mixed results among majors and faculty. Specific issues among faculty included, consensus of material covered, appropriate level for the course, and teaching assignment for the course. Overall, the experience has been positive among faculty and students.

2015 NACTA Abstract Poster Presentations

030

Successful Development of Niche Programs in Agriculture: Administrative and Industry Issues

Danny Walker, Jason Roberts, Emalee Buttrey and
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The University of Tennessee, Martin

Attracting new students into agriculture is important during difficult university budget cycles. The downturn in the U.S. economy starting in 2008 has resulted in diminished state revenues for many colleges and universities. As a result, many agriculture programs are working to develop programs to attract new students to boost enrollments to help offset decreasing state budget support. To be successful, departments must work closely with industry to develop programs that meet the needs of the profession and be attractive to potential students. Effective program development is similar to the old adage of the chicken or egg debate. Is program development driven by industry need or by student interest? The answer is a combination of both. In 2013 the University of Tennessee at Martin developed a new program in veterinary health technology to meet industry demand and provide an alternative pathway for students interested in animal science careers. The success of the new program required administrative, faculty, and industry support. This presentation develops a case study that focuses on critical issues such as budget constraints, faculty workloads, new outreach model for obtaining industry partners, and accreditation issues. The program was able to reach critical mass at 120 students two years from inception. Findings revealed that issues related to synergy among existing programs and resources was critical to the success of program development. The two most important issues were related to faculty ownership and administrative support. It is possible to build new programs that reach a diverse audience while enhancing existing programs.

032

Integrating Containerized Native Perennial Plants into Greenhouse Crop Production Curricula

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Kansas State University

Greenhouse crop production courses traditionally focus on the production of ornamental crops, including containerized annual and perennial bedding plants and potted flowering plants. While the majority of greenhouse production is centered on the production of ornamental crops, there are other non-ornamental crops that are becoming important for greenhouse producers, such as greenhouse food crops and containerized native plants. In response to increasing interest, some greenhouse curricula are being changed to include a focus on food crop production. However, the production of containerized native plants is virtually absent from greenhouse crop production curricula. Our objectives were to quantify student interest in and knowledge of containerized native plant production in an undergraduate greenhouse crop production course. Students completed a pre- and post-course self-assessment on their understanding and interest in containerized native plant production and containerized plant production research. Students also completed a 10-question quiz on the production of containerized native plants. In the laboratory portion of the course, each student conducted an experiment with two native prairie herbaceous perennial species each grown in nine different substrates employing a factorial combination with substrate pH (three levels) and controlled-release fertilizer concentration (three levels) as factors. When the results of the self-assessment and quiz are taken together, the student interest in and knowledge of containerized native plant production increased over the semester. Integrating greenhouse crop production course content focused on containerized native perennial plant can increase student's understanding of an emerging class of greenhouse crops.

033

Advancing Your Scholarly Teaching into the Scholarship of Teaching and Learning (SoTL)

Ann Marie VanDerZanden*, Cindy Haynes and
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Iowa State University

Scholarly teaching focuses on student learning and is grounded in the subject matter being taught, and in the implementation of effective pedagogies. The scholarship of teaching and learning (SoTL) on the other hand is research focused on teaching and learning. SoTL involves framing a research question related to student learning and systematically investigating it. The research methodology may include qualitative and quantitative data collection as well as direct and indirect measures. Data analysis may take multiple forms as well. The final step is to make the research public through peer-review

2015 NACTA Abstract Poster Presentations

and critique. Similar to disciplinary focused research, an important end goal of SoTL is to communicate research findings with members of the professional community so they in turn can build on the work and advance the practice of teaching beyond an individual classroom. The objective of this session is to outline a framework and provide a stepwise process to guide faculty in developing a publishable scholarship of teaching project.

034

First Year Experience for Veterinary Science Students: Starting in the Right Direction

Jason Roberts, Danny Walker*, Emalee Buttrey and Joey Mehlhorn
University of Tennessee, Martin

Using college orientation programs to help students' transition to college and improve student retention are becoming more prevalent on college campuses. It is important for students who plan to pursue professional degree programs such as veterinary medicine start planning early in their academic career for success. One program that can be helpful is the development of a first year initiative (FYI) program designed specifically for veterinary science students. These programs can be used to reinforce key concepts, develop healthy study habits and develop a mentor relationship with students. The University of Tennessee at Martin has been conducting FYI programs for the past seven years to help engage students early in the academic process. Data has been collected for the past three years on student engagement with curriculum, demographics, academic success, and career expectations for veterinary medicine to measure program success. Data revealed that many students come to campus with limited understanding of the requirements for successful entry into the veterinary medical profession prior to the FYI program. After the completion of the program, students showed a significant increase in their understanding of curriculum selection and how it relates to a career in veterinary medicine. However, one area of concern is that students rated understanding concepts and personal characteristics as less important than general coursework. As a result, FYI faculty should stress the importance of non-academic issues that relate to successful career development. The development of an expanded mentoring program should also be a consideration.

036

Advising Perspectives Inventory and Workshop Outcomes

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Good academic and career advising is a form of teaching. The Teaching Perspectives Inventory questionnaire developed by Pratt and others in 2001 was modified to fit the advising function. A highly interactive workshop (which included role-play skits) on the topic was piloted with Agriculture staff and faculty advisors at Purdue University and subsequently will be repeated with other campus advisors. Participants in the workshop completed the questionnaire and improved their understanding of the five perspectives (transmission, apprenticeship, developmental, nurturing, and social reform). These perspectives represent different aspects of the advisor role, which may be more or less natural to them. Prior to the workshop, participants identified their dominant perspectives which were most often transmission and apprenticeship; social reform was generally recessive. Advisors evaluated the workshop on a scale of 1 (no effect) to 5 (absolutely). Scores were: i) I have a better understanding of varied roles and perspectives as an advisor (3.6/5.0); ii) I have better ideas for advising meetings and communications (3.2/5.0); This workshop helped me think through ways I could improve my advising effectiveness and impact (3.5/5.0); This workshop helped me think through ways I could improve my advising efficiency (2.8/5.0). The questionnaire and detailed results will be presented at the conference.

037

Using a Pen Pal Program to Assess Student Learning In Science and Communications

Samantha Green*, Michael S. Retallick and Cynthia Haynes
Iowa State University

Youth at two schools (St. John, USVI and West Liberty, Iowa) participated in the *I Grow Culture* Pen Pal program. The purpose of the 8-week program was to evaluate how well middle school students communicate about local gardening and science. The collaborating schools were specifically chosen because they meet the criteria of having a garden for middle school students to integrate English and science into their agriculture curriculum. Specific objectives of this study were to 1) increase understanding of local gardening, 2) establish a garden-

2015 NACTA Abstract Poster Presentations

based distance cultural relationship, 3) practice communication technologies to improve writing and science communication, and 4) increase awareness of sustainability in both environments. The program supported expository writing skills, understanding of traditional learning systems, and improved knowledge of garden diversity and practices. Pre and post questionnaires with multiple choice and open-ended responses were administered to evaluate knowledge gain with the pen pal program. Additional documents such as suitcase of artifacts, brochures and videos were developed by the students and collected to evaluate students' perspectives on culture, agriculture and sustainability. Preliminary results showed that Caribbean students are more confident to explain their school garden while the Iowa students have a better understanding of sustainable gardening. Both schools have identified the need to keep their garden growing for years to come.

038

UFCTI: Measuring Students' Critical Thinking Styles

Alexa Lamm and Ricky W. Telg
University of Florida

The ability to think critically has been identified repeatedly as a cognitive style necessary for success because it represents the ability to deal with decisions faced every day. Researchers have argued that for students to reach their fullest potential, they must learn to think and reason critically. The University of Florida Critical Thinking Inventory (UFCTI) provides an empirically based instrument to measure critical thinking styles. The UFCTI, a survey instrument offered online, is a tool that teachers can use to better understand how their students think and, therefore, allow them to design curriculum and assess students accordingly. The UFCTI measures a range on a continuum between two styles of critical thinking: Engagement and Seeking Information. Persons with a seeking information style ("Seekers") are aware of their own predispositions and biases, recognizing their current opinions and positions have been influenced by their environment and experiences. Persons with an engagement style ("Engagers") look for ways to participate in conversations as they think critically, are aware of their surroundings, and are able to anticipate situations where good reasoning skills will be necessary. Relaying information and asking students to process information in ways that align with their critical thinking style should lead to educational experiences with lasting results. The UFCTI has already been used to assist more than 1,000 students understand their own critical thinking style. In-

terested individuals can become certified to administer the UFCTI in classrooms, Extension presentations, and workshops. For information about the UFCTI, visit <http://www.ufcti.com/>.

039

Delivery and Student Perception of a Flipped Senior-level Soil Science Course

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Oklahoma State University

Although some disadvantages of a flipped class had been reported, many laud the promise that it brings in enhancing student learning. Environmental Soil Science – an applied, senior-level soil science course was delivered via the flipped format. Of interest in this investigation were the students' perception related to degree of learning, class workload, student involvement and overall value of the flipped course. The class consisted of 25 students from the agriculture, natural science and engineering programs who have completed at least 90 credit hours. All students have not taken a prior flipped class. Class evaluations reveal that students liked the degree of learning and student involvement. In addition, the higher-than-usual quantity of student-centered activities brought by the flipped delivery did not seem to negatively affect their perception of course workload. The course scored a very satisfactory rating in terms of overall course assessment. Apart from the results of student evaluations, this paper will also share the promises and the challenges of flipping a senior-level soils course.

042

Concept Development in an Entry-level Landscape Design Course

Lisa Orgler
Iowa State University

The design concept is the core that holds a landscape design program together. When the design concept is personalized, it becomes a powerful focus for the design and helps generate additional landscape value for the client. Developing a design concept is similar to choosing a topic for a term paper. Without it, content is meaningless. Over twenty years ago while studying landscape architecture, I was asked to develop a concept for a landscape design. I struggled with this idea for the next two years until the light bulb finally switched on. Not being taught a process in college, I strived to create an easy

2015 NACTA Abstract Poster Presentations

step-by-step method for concept development from idea to physical form following graduation. I used this method for eight years at Iowa State University's Reiman Gardens to teach staff (including horticulturists, educators and administrators) how to develop concepts for not only horticulture displays, but also educational programming. For the past four years I've used this same process to teach undergraduate landscape design students in the Department of Horticulture about concept development to create innovative, yet still practical designs with a strong sense of place. The five steps include: 1. Pick a theme, 2. Create a brainstorm list, 3. Research theme further, 4. Translate ideas to physical form (plants, hardscape materials, colors, garden structure, furniture, etc.), and finally, 5. Create the plan. This process has allowed students to grasp the idea of concept development more quickly, while allowing them to become stronger designers.

046

Service-learning in a Community Nutrition Course: Technology-enhanced Strategies for Assessment of Student Learning

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Virginia Tech

The high impact practice of service learning fosters community engagement and community university partnerships in agriculture and life science courses. Service-learning experiences are designed to connect course content, enhance community engagement, and bridge theory to practice through experiential learning in a real-world learning environment while embedding opportunities for student reflection and assessment measures throughout the process. The over-arching goal of including service learning in a *Community Nutrition* course was to develop students' interest in the practice of community nutrition while demonstrating the complexity of community partnerships. This service-learning component, a 20 hour course requirement, was included as an experiential learning opportunity, based on Kolb's model of experiential learning, in order to encourage the development of vital soft skills (communication, self-management, decision making, teamwork, professionalism, and leadership), that would be difficult to develop solely within a classroom setting. iClicker technology, a personal response system, was used to gather feedback on progress toward meeting learning objectives and to encourage reflective thinking. iClicker results from before and after the service-learning experience were tested for significant differences using paired Student's t-tests (α

<0.05). Within the context of this *Community Nutrition* course, students felt more connected to the community but failed to see how the service-learning experience served as an opportunity for unique skill development. The results of this study indicate the importance of aligning service-learning assignments with course learning objectives, incorporating ongoing assessment and requesting student feedback.

047

Students' Perceptions of Enhancing Teaching-Learning Environment in Agricultural Classrooms

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The Pennsylvania State University

The teaching-learning environment within a classroom relates to the students' classroom perceptions. Studies have shown that students' classroom perceptions relate to the quality of learning they experience than the teaching itself and assessment processes. The purpose of this study was to examine students' perceptions of student-student and student-staff relationships in US and Brazilian agricultural classes. Data for this study came from Brazilian students (N=12) who had taken one or more agricultural classes at a US land-grant university. The students were given a 25-question survey (11 scaled items and 14 open-ended questions) to complete and were also interviewed (in English) either face-to-face or by Skype. Questions on the survey/interview included student-to-student and staff-to-student relationships. Results showed that student-staff relationships tended to be more positive in the US than Brazil. Student-staff respect and feeling that students' opinions were valued related to these perceptions. Participants indicated that US faculty showed higher levels of enthusiasm for the content being taught and provided a comfortable learning environment to ask questions compared to Brazilian agricultural classes. Small class size was also viewed as an influencing factor in student-student and student-staff relationships in both the US and Brazil. Participants had varied responses about student-student relationships; many noting that this area could be strengthened in US courses with more hands-on experiences or field trips. In conclusion, additional field trips and hands-on, application activities in US undergraduate agriculture classes would positively benefit student-student and student-staff relationships, and therefore, promote a more positive classroom environment.

2015 NACTA Abstract Poster Presentations

048

From Exposure to Challenging Urban Youth with STEM in Agriculture through the Purdue Agribusiness Science Academy (PASA) Summer Institute

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This presentation outlines important strategies, and assessments of designing and implementing a summer institute for urban and first generation college bound students in high school where the use of STEM in Agriculture serves as an exposure element to new experiences, while challenging the students to become post-secondary ready. This process used by the Office of Multicultural Program in the College of Agriculture at Purdue University starts with research of the State Standards for science and agriculture in K-12 as the foundation and builds on the agricultural science related concepts and activities at the University level. The student experiences will serve as a bridge between the science curriculum/co-curricular that students will be engaged in during the school year. Students will have an opportunity to apply in the summer what they have learned throughout the academic year. The student becomes more actively involved in the learning process than in traditional, didactic education. Equally important is implementing a pretest and posttest, as well as daily assessments to help capture the building blocks of the summer institute. Four years of data suggest a growth in interest, and participation in STEM. An informal assessment was used through vocabulary growth of students in a word maze around agriculture topics; a simple but visually powerful assessment. The students are also exposed to agricultural businesses through farm and corporation visits to explore the career opportunities in agricultural sciences and assessed by interest as well. The visits are designed to help students see the benefit of STEM in agriculture.

049

Changes in Student Perception of Food Animal Agriculture Following Discussion of Controversial Topics

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North Carolina State University's Introduction to Animal Science lab has integrated a lecture on controversial issues in food animal agriculture. With the use of photographs and marketing materials, the class discussed topics such as food security and production, human population growth, animal welfare, and environmental health. Student perceptions were evaluated through pre- and post- lab surveys collected over two years ($n=135$) with responses ranging from "not at all" (score 1) to "very much" (score 5). Three topics increased in score ($P<0.01$): "How aware are you of the current issues facing animal agriculture?" (3.06 pre to 4.17 post), "Can you describe the difference between animal rights and animal welfare?" (3.58 pre to 4.55 post), "Do you consider the US Food supply to be safe, wholesome and nutritious" (3.41 pre to 3.87 post). Following the lab, students expressed that their understanding of poor animal husbandry changed (3.75, $SD=0.09$) and that they had a better understanding of how animal agriculture interacts within the environment (4.22, $SD=0.07$), antibiotic usage in animal agriculture (4.29, $SD=0.08$), and hormone usage in animal agriculture (4.27, $SD=0.08$). In year two, students were able to participate in an anonymous in-class poll to display the range in ideas among peers. While the in-class polls encouraged student discussion, there was no difference in changes in perception following the lab with the addition of the poll according to the surveys ($P>0.1$). Based on student responses, this lecture was determined to be an effective and worthwhile addition to this introductory level course.

051

Utilizing Videos to Enhance Student Understanding of Soil Science Calculations

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Oklahoma State University

Topics in a soil science course that involve calculations have proven to be challenging to students. These include calculations about mass-volume relationships, soil water, soil chemical properties and fertilizer rates. As a substitute to one-on-one review meetings, we prepared videos that discussed various equations and discussed step-by-step calculations of sample problems. Videos are produced by Adobe Connect®. Online links to the videos are provided to students for unlimited access. Students have found these videos as helpful tools in enhancing understanding and proficiency in performing calculations. While a number of students did not use the videos because they felt they did not need to, many students who accessed the videos believed that their

2015 NACTA Abstract Poster Presentations

scores in assignments and exams were definitely better because of the extra help provided by the videos. Student comments about the videos were generally positive and they recommend that similar videos be prepared to compliment classroom discussions of complicated concepts in soil science.

052

Implementation and Assessment of Cross-curricular, Case-based Food Safety Educational Materials for the Secondary Education Community

Adrienne E.H. Shearer*, O. Sue Snider and Kali E. Kniel
University of Delaware

Secondary school educators and their students are critical audiences for food safety education outreach. Integration of food safety principles and applications in the formal educational setting has the potential for far-reaching and sustained impact among young adults, providing life skills, scientific civic literacy, and awareness of career opportunities anticipated to increase with the increase in human population and food needs. Instructional materials were developed, including a presentation on food microbiology, case studies on foodborne illness outbreak investigations, a video on detection of foodborne microorganisms, and web-based games. Five teachers utilized and evaluated the materials with nearly 300 students in various science courses. Teachers implemented at least two components of the materials, administered a student test before and after implementation, and completed a feedback questionnaire. The 50-question student test format was multiple choice or true/false and covered topics in food microbiology, microbial detection and control, regulatory issues, and safe food handling practices. The teacher feedback questionnaire consisted of 20 questions to rate the materials on a 5-point scale on quality, ease of implementation, and student enthusiasm. Of the materials provided, the presentation and case studies were most commonly utilized. Teachers rated the materials good to excellent on all measures of quality, implementation ease, and student interest. A positive change in familiarity with food safety concepts for four groups of students, representing approximately 77% of the participants, was demonstrated by an overall increase (4 to 14%) in correct responses after exposure to the educational materials as compared to prior to use.

053

Development of an On-line Game for Post-secondary Food Safety Education

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Jeanne Gleason, Barbara Chamberlin, David Abraham and Pamela Martinez
New Mexico State University

Food safety is an expansive, increasingly complex, and critical issue to our growing population. Consequently, there is a need for an increase in the number and diversity of post-secondary students studying food safety. Multimedia-learning tools support traditional styles of learning with potential benefits of more equalized access, player control over learning, and cognitive enhancement through multiple sensory learning paths. Multimedia-learning tools also provide an avenue to gain interest among students not formally vested in a subject. The objective of this presentation is to showcase the design and development of a multiple-use, web-based game for post-secondary food safety education. The learning module is the product of an inter-institutional collaboration to improve the quality of academic instruction and to attract undeclared majors to food science. The game features an array of food products at risk for transmitting pathogens. The player-learner is challenged with minimizing these risks by intervening at critical steps throughout manufacturing and is rewarded for accuracy and speed in protecting the consumer. The player gains an understanding of food safety within the larger context of agriculture, food manufacturing and public health. Students at three institutions will be used to assess the module and its impact on knowledge, bias and attitudes regarding food safety and agriculture.

055

The LEADERS Program: Experiential Learning Opportunities for Hispanic Students in Animal Science

Kim McCuiston*
Texas A&M University-Kingsville

Clint Löest
New Mexico State University

The LEADERS Program: Learning, Enhancing and Developing Experiential Research Skills is a collaborative,

2015 NACTA Abstract Poster Presentations

4-year project between Texas A&M University-Kingsville and New Mexico State University animal science programs. The purpose of this USDA funded project is to increase the number of Hispanic leaders in animal science through engagement in experiential learning activities that enhance scientific skills, professional development, and ultimately increase retention and graduation rates. Project goals are to 1) increase the quality of instruction by transcending the classroom for teaching and learning, 2) increase the number of Hispanics with a degree in animal science, and thereby 3) increase the number of Hispanic leaders in the field of animal science. Goals are accomplished through student research training, professional conference participation, internships, and educational tours. After the first year, 11 (7 Bachelor's and 4 Master's) students were involved with the program and were surveyed about their experiences. Demographic survey results found that 100% of the students are Hispanic, 90% are bilingual, and 60% are first generation college students. Students were engaged in research (70%) and presented at conferences (80%). Students feel that they now know what courses align to their career interest (60%), are aware of USDA internships (60%), and those students interested have acquired internships (70%). Results from the initial year of project implementation are promising in developing a program that provides and encourages opportunities outside of classroom learning. Support provided through this grant program has the potential to enrich educational careers and improve Hispanic leadership in the animal science industry.

058

Using Case Study Reusable Learning Objects (RLOs) to Facilitate Critical Thinking in Food, Agriculture, and Natural Resources

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University of Florida

Critical thinking is an important skill necessary for the success of college students and future agricultural professionals. However, professors often struggle implementing activities that challenge students to think critically. This study implemented multiple contextually-rich, multimedia case studies in the form of Case Study Reusable Learning Objects (RLOs) into an agricultural issues course at the University of Florida. The Case Study RLOs focused on food security issues in the nation of Trinidad and Tobago. Students participated in a focus group at the end of the semester to explore how usage of these RLOs impacted their learning. This research

provides a summary of the most common critical thinking themes found in the students' responses. Three main themes emerged from the group: critical reflections, future learning, and pedagogical suggestions. In *critical reflections* students analyzed what they learned in the RLOs and made comparisons to how it fit within their existing knowledge base. In *future learning* students identified the deficiencies in what they knew and proposed a variety of activities to enhance their learning, especially within a global context. In *pedagogical suggestions* students offered ideas on how to implement Case Study RLOs in other classes. This research contributes to the ongoing study of developing critical thinking skills through innovative courses and activities. Results also indicate that Case Study RLOs can be a tool used to provide students opportunities to think critically.

060

Benefits of the Conservation Reserve Program on Highly Erodible Land

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The 1985 Food Security Act created the conservation reserve program (CRP) which was designed to take overused and highly erodible farmland out of production. In doing so, the land returns to its natural state by replenishing the nutrients as well as the water and wildlife. Returning conventional farmland back to native grassland helps reduce water runoff and the amount of erosion and soil loss to the area. Research shows that constant tillage reduces carbon, nitrogen and other nutrients in the soil. Fallow land helps to retain some of the nutrients for a longer period of time compared to constant tilling. CRP helps restore land closer to the natural state than constant tilling or fallow periods. CRP may also increase water absorption and reduce the amount of water runoff that would occur more readily on tillage farms helping to increase nutrient levels and the overall health of the soil. Converting highly erodible and overused farmland to CRP benefits the environment in numerous ways resulting in nutrient rich soil that provides a habitat for many different species of wildlife. Returning farmland back to a more natural state reduces topsoil loss and excessive loss of water compared to conventional tillage farmland. CRP is a way to preserve land for future generations by leaving nutrients in the ground and providing a home and shelter for wildlife that otherwise would have nowhere to nest and reproduce.

2015 NACTA Abstract Poster Presentations

061

The Impact of a Manuscript Critique Program on Horticulture Students' Knowledge and Perceptions toward Scientific Writing

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University of Arkansas

In most universities, researchers are responsible for instructing students in research methods and writing research manuscripts. In order to improve research assistants' scientific writing skills, we developed a manuscript critique program for the University of Arkansas Horticulture student research assistants. In order to determine the impact of the program, the following objectives were created: 1) determine the impact of the program on participants' knowledge regarding scientific writing; and 2) describe participants' perceptions regarding their ability to prepare manuscripts. This case study utilized a mixed methods approach. A knowledge exam was administered before and after the semester-long program. Descriptive statistics were used to determine participants' knowledge change. A focus group was conducted at the program's conclusion. Thematic analysis was used to unearth focus group themes. Participants' mean pretest score was 67%. Pretest scores ranged from 43% to 78%. Their mean posttest score was 71%, with scores ranging from 50% to 83%. Focus group discussion revealed that students felt more confident about writing journal manuscripts, learned that publication alone does not indicate quality research, and were able to better comprehend studies about which they read. However, they also indicated that guided practice in scientific writing during the program after a period of manuscript critiquing would be beneficial. We recommend that agricultural programs host similar programs for their students. Additionally, findings suggest that concrete experiences in both reading and writing and prolonged involvement may improve students' confidence in scientific writing.

062

Behind the Scenes: Working a Professional Golf Event

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Mississippi State University

Students (n=16) enrolled in Turf Management (PSS 4414) at Mississippi State University volunteered at the Sanderson Farms Championship Professional Golf Association (PGA) tournament held at the Country Club of Jackson from November 4 - 9, 2014. Students spent

their time in content-specific tasks such as divot filling, bunker raking, dew removal, mowing, observing equipment maintenance, and course set-up. Students also attended meetings and learned agronomic topics from the superintendent and PGA agronomist. Kolb's Experiential Learning Model was used as the theoretical framework for this learning activity. The four stages of the cycle include: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Qualitative research methods were used to collect and analyze the findings related to this learning experience. Students were asked specific questions before, during, and after the event to guide their reflection. A total of six research questions were used to investigate the results and themes were developed related to each of the questions. Students were able to articulate learning technical skills, soft skills, best practices, and the importance of experiential learning activities to put into practice the content they learned in a classroom setting. It is recommended students be encouraged to seek experiential learning opportunities to strengthen their skills and competencies related to their future career. Teachers can offer these experiences as a component of a course or as supplemental opportunities for students. The amount of learning that occurs in experiential settings cannot be understated and should be emphasized in all academic programs.

063

Self-Perceived Leadership Competencies among Agricultural Sales Students

Sarah Wright* and K. Jill Rucker
University of Arkansas

As a process, leadership skills can be developed within the classroom over the course of a semester. Leadership skill development can be reinforced without any direct approach and hence be a bi-product of a course whose main focus is not leadership. This study was designed to evaluate students enrolled in an agricultural sales course offered at the University of Arkansas to determine if the course content, agricultural sales influenced their leadership skills as related to the profession of sales. A total of 116 students were given a series of personality and leadership assessments disseminated through a pre-test/post-test method, 97 students, an 83.62% response rate, completed the assessment packages. Assessments included Task vs. Relationship Orientation, Psychodynamic Approach, and StrengthsFinder. Students also were asked to complete a demographic questionnaire. Results concluded the majority of students had an agricultural background, were primarily enrolled in the College of Agricultural Sciences and Natural Resources, and grew up in a rural area or on a farm.

2015 NACTA Abstract Poster Presentations

Additionally, students perceived a strong connection between leadership traits and the sales industry such as relationship orientation, extroversion, the ability to interact easily with others. Moreover, the students who demonstrated these traits indicated an interest in entering the sales profession. Recommendations for future study include further implementation of leadership assessments in agricultural sales and marketing courses, an analysis of agricultural sales industry professionals' leadership traits and characteristics, and evaluation of the agricultural sales and marketing curriculum.

065

Making Sense and Consensus for Agricultural Training and Education to Cope With Climate Change

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Virginia Tech

Reputed scientific organizations such as NASA, NOAA and IPCC have increasingly found that there is psychological, social, physical, and economic evidence of climate change impacts. However, the authors found little work is being done to incorporate this into education and training regimes for the agriculture sector. In this context, we first need to convince the agriculture stakeholders to reach a common understanding of climate change and its impacts on agriculture, and then create appropriate and transferable coping strategies. The resulting changes in attitudes and behavior will be the basis for making curricula more relevant, developing coping strategies, and will lead to more profitable and productive agriculture. The objective of the research was to study the perception and degree of consensus towards climate change and to seek what kind of educational strategy should be created to overcome the skepticism. This paper is based on personal interviews and discussions with students, scientists, agriculture professionals, general public and extension agents in agriculture. Our study conducted in Blacksburg, Virginia reveals that 75 % respondents perceived the climate change is happening. About 70% the sample expressed that increasing awareness and training opportunities for social, economic, educational, and political institutions will create a workforce skilled to adapt and help mitigate the impacts related to climate change.

068

The Sweet Potato Innovation Challenge

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In 2013 Mississippi sweet potato stakeholders recognized the need for increased value-added sweet potato products. At that time, the supply of processing-grade sweet potatoes exceeded their demand, resulting in excessive waste and low prices. In 2014 the Sweet Potato Innovation Challenge was created to address stakeholder concerns while promoting service-learning, increasing undergraduate research opportunities, boosting entrepreneurship and the development of soft and hard-skills, and encouraging underrepresented demographic groups to pursue careers in agriculture. "The Challenge" is divided into two phases. In Phase 1 students are introduced to the problem, visit with farmers to learn about sweet potato production, and begin developing novel sweet potato-containing products. The students then present their concept designs to a panel of judges. Students with acceptable product ideas move to Phase 2. In Phase 2 students continue to develop their product with the guidance of a faculty mentor in order to create an advanced prototype that can be marketed to an industry partner. In fall 2014, 147 students, divided amongst twenty-three groups, participated in Phase 1. Eleven groups were selected to move to Phase 2, receiving \$500 to \$1,000 for product development. A pretest-posttest study design was implemented to assess improvement of short-term project outcomes related to service-learning concepts and knowledge about the agricultural sector. Students' civic mindedness, problem solving ability, leadership, perception of the meaningfulness of the service-learning course, and knowledge about the agricultural sector did not statistically improve for participants in the Sweet Potato Innovation Challenge who participated in the pretest and posttest (n=50).

2015 NACTA Abstract Poster Presentations

072

Development and Evaluation of the Transdisciplinary Obesity Prevention Research Sciences Program

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The Transdisciplinary Obesity Prevention Research Sciences Program (TOPRS) is an applied research methods curriculum for undergraduates on the causes and consequences of childhood obesity that has been developed by a multidisciplinary team from the University of Illinois at Urbana-Champaign, Purdue University, and California State University-Fresno. To address the need of the contemporary workforce the course has been developed to integrate transdisciplinary approaches 1) to knowledge about the causes, consequences and correlates of obesity from an ecological framework from cell to society, 2) hands-on field experience, and 3) a professional development series. The class format is a “flipped” version with students viewing 10-minute microlectures and class time spent in interactive discussions and activities focusing on research design and methodologies. The microlectures are presented by national experts in nutritional sciences, animal science, child development, family science, early care and education, community health, and public health. The professional development activities reinforce leadership and team building skills. In this presentation, we will describe the development of the TOPRS program, as well as the results of a pilot evaluation that has revealed students’ ($N = 53$) increase in knowledge and confidence related to obesity causes and consequences and interdisciplinary research. We will describe the iterative process of integrating evaluation results with curriculum design and plans for future dissemination.

073

Experiential Learning in Distance Locations

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Exposure to real life experiences is a core outcome for undergraduate students in the College of Tropical Agriculture and Human Resources (CTAHR), University of Hawaii at Manoa (UHM). Hawaii, with 11 of the world’s 13 climate zones and 10 of the world’s 12 soil orders, is the most remote populated land mass in the world, and

is much more ecologically diverse than most US states. It thus represents a rich living laboratory for studying agriculture and natural resource management. The islands in the Hawaiian chain are different from each other, physically, culturally, and agriculturally, and distinct from other US states and international locations. With the aim of providing a well-rounded learning experience for students, CTAHR continuously seeks experiential learning opportunities off the island of Oahu where UHM is located. A major challenge in offering experiential learning off-island is the substantial cost of airfare, ground transportation and living expenses for students and faculty. In spite of these high costs, roughly 20% of CTAHR’s undergraduate students participate in hands-on learning activities (often planned by students) on the neighbor islands, the US mainland, and internationally every year. Different ways students are exposed to diversity in cultures, physical landscapes, and careers in the agricultural sciences, means for funding these experiential learning opportunities, and options for offering hands-on learning for formal credit and assessing learning outcomes are explored. Experiential-learning activities provide an excellent opportunity for students to apply knowledge gained in the classroom and gain experiences beyond the boundaries of the classroom.

074

Motivating Factors for Student Choice of Major: A Longitudinal Study

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The purpose of this study was to identify factors that influence students’ choice of major when enrolling in the Agribusiness, Agricultural Education, Agricultural Mechanization & Business, Horticulture, Turfgrass and Plant and Environmental Science programs within the College of Agriculture, Forestry, & Life Sciences (CAFLS) at Clemson University. Specific research questions were developed to determine: the intended major choice; reason why the student may have changed majors; the level of influence of individuals, along with the characteristics of the anticipated degree program to see if they influenced major choice; when the student began and finalized the college/major choice process; and the principal factor that influenced the student’s decision. This three-year study had a population of 91 purposefully selected freshman and transfer students throughout the programs during the fall 2012-2014 semesters. A panel of experts developed the questionnaire that was administered by SurveyMonkey. The findings indicated the most influential individual when choosing a major was a CAFLS fac-

2015 NACTA Abstract Poster Presentations

ulty member followed by the parent or guardian and their agriculture teacher. The most important factor motivating a student's decision was the career opportunities available after graduation followed by a tie between the reputations of the courses and faculty. Students reported their main reason for changing majors was career opportunities. For the last three years, they reported having made their final decision about majors during the senior year, second semester of high school. Findings suggest that recruiting efforts need to target and communicate with parents and agriculture teachers as early as possible to increase enrollment.

075

An Examination of School-based Texas Agriculture Science Teacher Position Announcements for the 2014-2015 Academic School Year: Are Teachers Prepared to meet these Challenges?

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Texas State University

Each year in public education, teacher turnover and the subsequent teacher replacement is a challenge for school administrators. In agricultural education, research indicates that the nation is facing the worst teacher shortage ever. There are many reasons why teachers leave the teaching field, but according to research, career satisfaction is a major concern. The purpose of this non-experimental, mixed method study was to analyze all ($N = 316$) of the Texas agriculture science teacher position announcements, (2014-2015 academic year), posted on academic career websites and determine the qualifications desired by local school districts. Sample announcements were analyzed by a panel of experts to identify emerging themes. After the themes were identified, an analysis was completed of the position announcements utilizing IBM SPSS Statistics 21. Measures of central tendency were used to describe the position announcements and their desired qualifications of the teaching candidates. Results from the study indicated that the majority of positions were: 12 month positions ($n = 102$; 32.3%), required a state teaching certification ($n = 242$; 76.6%), and required a bachelor's degree in agriculture or related field ($n = 187$; 59.2%) and desired a specialization in agricultural mechanics ($n = 115$; 36.4%). Overall, researchers identified characteristics desired of Texas agriculture science teaching candidates for the 2014-2015 school year. If university teacher education programs can use these themes to amend their curriculum, new teachers could be prepared to meet the needs of Texas public schools and secure positions.

076

The Relationship of Quality and Quantity of Agricultural Mechanics Training in Agricultural Post-Secondary Preparation in the State of Iowa

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Agricultural mechanics coursework has historically been considered an important and necessary component of the secondary agricultural education curriculum. Agricultural mechanics courses have been a foundational piece of agricultural programs in the public education system in the last decade. Secondary agriculture programs have an inherent expectation to offer agricultural mechanics coursework due to the skills they help to develop in students. Evidence has indicated that agricultural teachers feel far less comfortable teaching agricultural mechanics courses than other agricultural related areas. The purpose of this study was to determine the relationship between the perceived quality and quantity of agricultural mechanics training that secondary agricultural education teachers received at the post-secondary level. From the data presented as a result of this study, it was concluded that there is a strong positive correlation between the perceived amount (quantity) of training and the quality of training that secondary agricultural education teachers receive at the post-secondary level. All 54 agricultural mechanics skills had a significant relationship. Since it is known that correlations do not infer causation, further research should be completed to determine agriculture educators understanding of quality versus quantity of training at the post-secondary level. Further research should be conducted to determine if secondary agricultural education teachers who were required to complete several agricultural mechanics courses have the same view of quality of training at the post-secondary level.

2015 NACTA Abstract Poster Presentations

079

Experiential Learning Activities as Tools to Promote Diversity in Food Science and Technology

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Experiential learning activities can offer unparalleled opportunities to explore new disciplines and assess career options. RISE: Pathways to Diversity in Food Science Careers is a project that provides experiential learning opportunities in Food Science focused on professional development and research experiences to stimulate students to consider and pursue careers in Food Science. RISE aims to increase the number of highly qualified Hispanic students in Food Science careers. Food Science programs in the United States and abroad are experiencing declining enrollments. It is estimated that if this trend continues, it will perpetuate a job vacancy gap in Food Science professions. Twenty RISE awardees from the University of Puerto Rico (ten graduate and ten undergraduate) have attended workshops designed to help them with their writing skills (English and Spanish), interpersonal skills, professional etiquette and to stimulate them to get involved in community service through their academic settings. Participants expressed much interest in these professional development activities and asked for future sessions that provide more in-depth information for certain topics. Workshop assessment surveys showed high ratings for most activities. The English writing workshop obtained the highest ratings of all workshops. This workshop series is part of a systematic effort to prepare students for an off-campus summer research experience. All participants have been placed at different USDA-Agricultural Research Stations (ARS) for the summer of 2015. These summer experiences will offer participants the opportunity to conduct Food Science research under the guidance of ARS scientists.

081

Experiential Learning Using Slow Motion Kinematic Analysis to Enhance Student Learning and Decision Making

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University of Georgia

Many collegiate equine programs offer courses in horse selection which typically cover topics such as confor-

mation, gait quality, and lameness. These classes often rely heavily on video based practice to give students experience in decision making and to help them “develop an eye” for evaluating horses. However, overuse of videos lessens the hands-on component of labs and can lead to student boredom and apathy. To address this, students in an upper level equine science course at the University of Georgia were assigned projects to evaluate gait quality and lameness by capturing video footage of live horses. Students first reviewed equine anatomy by placing reflective markers on specific anatomical locations of the limbs. Horses were then filmed using a high speed camera, and students imported these videos into a kinematic software program which allows the user to isolate and analyze multiple frames of each clip. Students were tasked to analytically evaluate each animal based on position of the reflective markers by using distance, time, and angle features integrated into the program. Students were required to reach a final decision on gait quality or lameness of each horse and present this in a scientific format. Survey results from initial use of this software showed favorable response; average student response regarding usefulness of program was 1.24 on a scale of 1-5 (1 represents the best score.) When students were asked if they would recommend using this program as compared to standard video learning, 100% stated that they highly recommended it.

082

A Peer to Peer Program for Teaching Family and Small-Scale Commercial Hydroponic Vegetable Production in a Low Cost Insect-Free Greenhouse for Tropical Areas

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William Sakai, Russell Shiohita and Marcia Sakai
University of Hawaii, Hilo

In tropical areas, fresh vegetables are not always affordable and most farms are small-scale. Our peer to peer program is taught for free as part of a farmer's market to be assessable to communities. Participants first use a series of six, 3 gallon buckets, with increasing spacing and nutrients while planting and harvesting six heads/week of lettuce or Asian greens. Success leads to more people adopting new technology, so even children work together in the “Community Greenhouse Gardens”. Throughout the program I teach and then peers happily teach new peers (participants). Teaching by peers

2015 NACTA Abstract Poster Presentations

makes the technology seem less complicated, so students in the Advance Certificate Program gladly volunteer to help others. Students advance through growing 96 lettuce heads/week in five - 4'x8'x6" tanks using two-inch net pots, to growing tomato, cucumber, pepper and eggplants in gravity fed three gallon buckets, to developing their own "Best Practices" for growing a "new" hydroponic crop. Our greenhouses use new woven plastics that last 7-10 yrs. and are seamed and grommetted and tightly attached to galvanized fencing pipe frames. The cover excludes UV-B light so to many small insects and mites, that only "see" UV-B light, these greenhouses appear "black," 50% knitted shade cloth on the sides keeps out larger insects.

085

Fitness Conditioning Opportunity Improves Classroom Knowledge and Encourages Personal Fitness

Kari K. Turner
University of Georgia

An extra credit opportunity in the form of a fitness conditioning program was offered to students in an equine exercise physiology course to help them better understand topics covered in class such as respiratory and cardiovascular adaptations to conditioning, and to encourage better personal fitness. Students were instructed to start exercising, specifically jogging, and a head-to-head 5k race against a rival university's equine exercise physiology students was organized at the end of the semester. After offering the opportunity for two semesters, former students were surveyed to determine effectiveness of the conditioning opportunity. Sixty percent of students chose to participate in the program. The majority of students (94.4%) that participated in the program stated that the conditioning helped them understand topics covered in the course better. Most students (94.4%) also stated that the program helped them with their own personal fitness. Prior to the extra credit opportunity, only 42.1% of respondents were in some type of fitness program, and most (63.2%) had not run a 5k race before. However, after the opportunity, respondents said they were somewhat likely (57.9%) or very likely (42.1%) to run another 5k race, and 68.4% of respondents were still engaged in a fitness program. A head-to-head 5k competition with a rival school also encouraged participation, as 79.0% of respondents said it made them want to follow through with the program. Offering an extra credit fitness conditioning opportunity in an equine exercise physiology course not only enhances understanding

of course topics but also encourages better personal fitness.

086

An Undergraduate Research Experience: Using Technology to Monitor Japanese Beetles Across New York State

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Since 2008, faculty at SUNY Empire State College have explored citizen science projects as an innovative teaching approach for nontraditional students to participate in hands-on learning. In 2011, we received a USDA NIFA Higher Education Challenge grant to develop The Beetle Project. The project is creating a virtual map of life stages and population densities of Japanese beetles, using data collected by students throughout New York State. Students use LabQuest units with various sensors to measure atmospheric variables, and soil temperature and moisture at predetermined soil depths. They also record beetle larvae number and size. The Beetle Project website contains supplementary information on Japanese Beetles and climate change, as well as videos on equipment use and data collection protocols. There are also alternative protocols for collecting data without the LabQuest unit. By participating in the project, students learn how to use technology in the field, learn about local climate, climate change, and impacts of nonnative species. The Beetle Project module is being implemented with students majoring in environmental science, and with students in general education courses. Faculty have observed a high level of student engagement in the project. Student feedback indicates that students place value on an assignment where they contribute data to a long-term research project. Students also report an intention to continue collecting data beyond the class assignment. In summary, the Beetle Project is a field activity that engages science and non-science students in a research experience, and it can be effectively integrated in a variety of courses.

2015 NACTA Abstract Poster Presentations

095

Does Global Mindedness Vary by Academic Major with Agricultural Disciplines?

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North Carolina State University

Students at all levels are learning that they live in a world connected across borders, cultures, and environments. How well are agriculture students getting that message? In this research, we investigate the level of global mindedness of agriculture students at North Carolina State University and compare the global mindedness of students within the different majors within the College of Agriculture and Life Sciences. The major you choose may well be influenced by your level of global mindedness (or vice versa). Global mindedness, a belief that you are connected to the world community and share responsibility for its members, is a skill that is necessary for an increasingly connected world. We need to be educating our students in ways that will allow them to thrive in a globally and culturally diverse workplace. The results of this research show that major does make a difference to the level of global mindedness of students entering college. What we do with this information is up to us as educators to get students where they need to be before they graduate and enter the marketplace.

096

Strategies for Teaching Weed Identification

Patrick J. Tranel
University of Illinois

A key objective of most undergraduate weed science courses is having students gain the ability to identify numerous weed species. Over several years of teaching weed science, I have developed and implemented multiple strategies to aid students in weed ID. First of all, I emphasize plant family characteristics: this provides students a background to identify new weeds they might encounter outside of the class. For identification of specific weed species, I utilize traditional approaches, including the use of slide sets and live specimens during class, making live specimens available for independent study, and taking “weed walks” with the students to identify weeds on campus. In addition, I have developed an online practice quiz. This quiz, administered through the course webpage, tests students using photos of weeds randomly selected from a large database. Based on student feedback, the most enjoyable and useful activity I

employ is a “weed scavenger hunt.” For this activity, students are taken to the university’s research farm and then compete in groups of four to find and accurately identify the most weed species. Another fun activity for the students is “weed ID Pictionary”. For this activity, students take turns drawing weed species while their team members guess which weed they are drawing. This activity challenges students to know some of the finer details (e.g., number of petals, leaf shape, branching pattern, etc.) that must be used to distinguish various weed species. Collectively, these strategies make weed ID less daunting – and more fun – for the students.

108

Integrating Native Perennial Plant Concepts into Plant Propagation Curricula

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Iowa State University

There has been increasing interest in using native plants in restoration and built landscapes. However, compared to many, more common commercial horticulture crops, there is a limited body of research and literature related to native plant propagation and production, leading to a limited number of native species available for use in plantings. A native prairie plants concept was integrated into an undergraduate plant propagation course at Kansas State University to begin to address this interest. One of the project objectives was to quantify students’ interest and knowledge of native plants and native plant propagation through the course. Pre- and post-course self-assessments were given to the students to evaluate their interest and understanding in native plants and propagating different species. In addition, as a part of the course laboratory, students worked in groups and conducted a seed germination experiment using two native prairie herbaceous perennial species. Each group determined their respective stratification and/or scarification treatments and will collect germination data. In the pre-self-assessment survey, 98% ($n=39$) indicated that they agreed or strongly agreed that they were interested in learning about native plants and that native plants are important for built landscapes. Seventy percent of the respondents ($n=28$) agreed or strongly agreed that that they could successfully define native plant while, 30% ($n=12$) disagreed or strongly disagreed that they could successfully define native plant. A majority of the class, 70% ($n=28$) disagreed or strongly disagreed with the

2015 NACTA Abstract Poster Presentations

statement that “the general public understands what constitutes a native plant.”

111

Desired Leadership Competencies among Agricultural Sales Professionals: A Delphi Study

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University of Arkansas

In agriculture, many available employment opportunities fall in to the category of sales. Agricultural sales can include livestock, commodities, equipment, veterinary supplies, and chemicals. In order to succeed in the sales industry, a variety of skills and traits are needed. While early leadership personality studies conclude that each individual possesses a unique set of characteristics that contribute to his or her success, later studies have been able to identify clusters of key characteristics possessed by successful employees within a given industry. Today's universities have a common goal – to prepare students to successfully enter the workforce and employers are seeking new college graduates who not only possess technical skills but also possess leadership competencies. The purpose of this study is to utilize agricultural sales professionals to identify the desired leadership competencies in a successful agricultural sales career. Of the original 36 sales professionals, 24 responded to develop a consensus of desired competencies to be deemed successful in the Agricultural Sales profession, giving the study a 66.67% response rate. The study was also guided to determine curriculum topics that should be included in an Agribusiness sales course to assist in bridging the gap between college and career.

112

Development of a Distance Education Program by a Land-grant University Augments the 2-year to 4-year STEM Pipeline and Increases Diversity in STEM

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The Microbiology and Cell Science Department in the College of Agricultural and Life Sciences at the University of Florida has developed an innovative 2+2 degree program. Typical 2+2 programs necessitate a transfer to a 4-year institution to complete a bachelor's degree. However, many universities in the United States, particu-

larly land-grant universities, are located in rural regions that are distantly located from their respective states' highly populated urban centers. This geographical and cultural distance could be an impediment to recruiting otherwise highly qualified and diverse students. Here, a new model of a 2+2 program is described that uses distance education as the vehicle to bring a research-intensive university's life sciences curriculum to students rather than the oft-tried model of a university attempting to recruit underrepresented minority students to its location. In this paradigm, community college graduates transfer into the Microbiology program as distance education students to complete their degree. The distance education students' experiences are similar to the on-campus students' experiences in that both groups of students take the same department courses taught by the same instructors, take required laboratory courses in a face-to-face format, take only proctored exams, and have the same availability to instructors. Results indicate this model is successful in increasing STEM participation and diversity significantly as more than half of the DE students are from URM backgrounds. This approach is particularly compelling as the distance education cohort has comparable grade point averages and retention rates compared to the corresponding on-campus transfer cohort.

113

Exploring Leadership Development through Community-Based Experiences

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We explored community-based leadership experiences, within a college of agricultural sciences, as a tool for leadership development. Our research objective was to determine students' progression through the experiential learning cycle. We conceptualized progress through the experiential learning cycle as evidence that community-based leadership experiences were an effective tool for leadership development. We developed five codes based on our operational model of experiential learning: concrete experience, reflective observation, abstract conceptualization, pre active-experimentation, and active experimentation. Data were collected through semi-structured interviews with 11 students involved in a year-long leadership development program. Students' reflections detailed their experiences volunteering within the community during their involvement in the leadership development program. A structured analysis of students' reflections produced evidence of all participants engag-

2015 NACTA Abstract Poster Presentations

ing in some aspect of the experiential learning cycle. Ten of the 11 students evidenced both concrete experience and reflective observation. Nine of the 11 students evidenced abstract conceptualization. Four of the 11 students exhibited pre active-experimentation, and three students shared evidence of active experimentation. Additionally, students' progression through the experiential learning process was analyzed by separating the participants into five groups based on their progress through the experiential learning cycle. For example, one group included three students who were coded as engaging in concrete experiences, reflective observations, abstract conceptualization, and pre-active experimentation. Through our analysis, evidence emerged indicating students' previous leadership experience may impact their progression through the experiential learning process. We recommend incorporating community-based experiences in leadership development programs and providing support consistent with a student's previous experience.

114

Career Interests of Agriculture Dual Enrollment Students

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A major developmental task of students is the formation of career interests and goals. This can directly affect students' ultimate career choices. With declining enrollment numbers in some areas of agriculture and changing student demographics, Students need to understand careers in agriculture when forming career interests. One way this can be accomplished is by reaching students early and by understanding what their current interests are. Guided by Social Cognitive Career Theory, this study sought to determine the demographics and career interests of New Mexico high school juniors and seniors ($n = 265$) enrolled in an animal science dual credit course. Career interest was evaluated from open ended responses that were categorized into 12 different career clusters based on a model provided by the National Association of State Directors of Career Technical Education Consortium (NASDCTEc). This model was chosen because it bridges, "secondary and postsecondary curriculum with individual student plans of study for a complete range of career options. Students were found to be predominately of Hispanic (38.9%), Caucasian (34.1%) or Native American (24%) ethnicity. Most stu-

dents had interests related to agriculture & natural resources (17.3%), health science (17.3%) and STEM (12.9%) careers. Students had the least interest in hospitality (2.7%) and education (1.8%). As educational leaders, we can use this information for developing agriculture career education and student recruitment purposes. We find this is especially important as we develop agriculture career aspirations within our underrepresented student populations and is an important step in expanding career opportunities.

119

Short-Term Study Abroad: What Concerns do Undergraduates have about International Travel?

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In order to encourage more students to study abroad, it is important to know what concerns students have about international travel. As faculty members become more aware of students' concerns, they can be addressed so students feel more comfortable with the idea of participating in an international experience, such as short-term study abroad. The purpose of this research was to examine concerns that student participants of a short-term study abroad program have about international travel. In this study each of the 23 student participants of the 2014 North Carolina State University College of Agriculture and Life Sciences Agribusiness Study Abroad Program completed questionnaires and participated in rounds of prelective and reflective focus groups before and after their time abroad. Questions focused on if they had concerns before their travel experience, whether or not those concerns were actually an issue or realistic during travel, and if any new concerns arose while abroad. The results show student participants of short-term study abroad programs hold concerns mainly about transportation, finances, language, and safety. This presentation will discuss the students' concerns and will give detailed recommendations on how we can address these concerns in a positive manner so that we can increase the numbers of students participating in an international experience and make those students more comfortable and aware while doing so.

121

Teaching Welding: Actual vs. Virtual Reality

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Theoretical learning in the classroom is prevalent in the education, including secondary agriculture. Specifically, in agricultural mechanics, students are taught in the classroom how welding works, yet may have little hands-on instruction due to various constraints. Students in some schools not equipped with a laboratory are being taught with Virtual Reality (VR). According to Dale's Cone of Learning (1969), less than 50% of what is read or given in lecture is actually retained in the cognitive mind, but students retain 70% by doing what is taught. To obtain this higher retention rate, VR is being used to apply a theoretical viewpoint of welding and hands-on manipulation. This study split 29 university students into groups, some learning to weld in the laboratory (hands-on) and others by VR. Students then completed an American Welding Society (AWS) 1G test plate after five practice passes. An AWS inspector evaluated the welds. No welds passed the full D1.1 AWS test due to the lack of root penetration; however, after eliminating this criteria, 60% of the hands-on students passed the AWS test, whereas only 6.25% of the VR-learning students passed. Notably, VR learning did result in a \$71 savings in materials, not including consumables. This and other technologies are available and relatively inexpensive, but can only teach the basic manipulations and not actual welding. Much is needed in advancing technology to teach to the higher standard that industry requires.

122

Nonlinguistic Representation as a Tool for Enhancing Thinking Skills

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Higher-order and creative thinking can be encouraged and fostered in college courses through the use of innovative assignments. Nonlinguistic representations, the use of pictures or pictographs, can be used to allow students to convey comprehension of subject matter in a very creative fashion. Eighty-one students over two semesters of an introductory course were taught about the history, development, and philosophy of agricultural education. Students were asked to read and critically think about the nine components of the philosophy of agricul-

tural education. They were then asked to create a visual representation, hand-drawn or computer generated, of their interpretation of the philosophy using minimal text. In addition to the visual, they were also asked to write a short explanation to more clearly communicate their graphic to the viewer. The representation was assessed on how well the illustration conveyed the philosophy, level of originality, creativity, as well as the clarity statement. Students appeared enthusiastic in regard to completing the assignment and were able to produce unique and inventive visualizations of the agricultural education philosophy. Asking students to critically think about the philosophy is very important to developing the targeted thinking skills. Some students struggle with this assignment because there is not one correct answer and no examples were provided to guide their work. Other disciplines could easily transfer the use of nonlinguistic representation assignments to encourage higher-order and creative thinking of key learning concepts. It is recommended purposeful selection of text occurs to utilize this practice in other courses.

123

Anxiety of Welding Lowered through Virtual Reality

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Budgetary and facility constraints can be limiting factors in teaching secondary agriculture students to weld. While it is essential to first teach theory, students must eventually experience the welding process for true skill acquisition. One alternative to developing welding skills in traditional agricultural mechanics laboratories includes the use of Virtual Reality (VR). This study involved college students in an introductory agricultural mechanics course. Participants (n=29) were split into four groups: hands-on welding with corrective instruction during practice; hands-on welding with corrective instruction after practice; VR welding with corrective instruction during practice; and, VR welding with corrective instruction after practice. Anxiety and confidence levels were also measured through surveys before group assignment, after group assignment yet before practice, after practice, and after completing an American Welding Society (AWS) test weld. No participants passed the AWS test due to the lack of root penetration; however, after eliminating this criteria, 60% of the hands-on students passed the AWS test, whereas only 6.25% of the VR participants passed. Regarding anxiety and confidence, VR participants had lower anxiety levels than their counterparts

2015 NACTA Abstract Poster Presentations

before and after practice, but higher anxiety levels after the test weld; however, hands-on participants were found to have greater confidence on all three occasions. Notably, VR learning did result in a \$71 savings in materials, not including consumables. While hands-on learning remains the best option for skill acquisition and developing confidence, VR can aid in reducing anxiety. Granted, much is needed in advancing VR technology to teach to industry standards.

125

Utilizing *Celly* Technology to Encourage Student Completion of Coursework

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Most students coming into college already have a wealth of knowledge and experience as well as positive outlooks towards mobile technology. *Celly* is a technology which can be used to encourage student interaction and participation in and out of the classroom by utilizing SMS text messages, iPhone/Android app features, and internet access to send reminders to students. The creation of a *Celly* account is a very straightforward and simple process. There are a couple of account options for educators, one of which is free. Notifications can be scheduled ahead of time or sent immediately. *Celly* was utilized in an agricultural presentations course the spring 2014 semester. The course consisted of 25 undergraduate students and utilized a flipped classroom approach that required students to watch recorded lectures and complete assignments before each class. The students were introduced to the technology at the beginning of the semester and assisted in the set-up of their account. *Celly* was utilized throughout the semester to send reminders to students about assignments, due dates, as well as any upcoming presentations. Students completed two questionnaires, one at the mid-point and another at the end, to assess how they perceived the use of *Celly*. On both questionnaires, students responded very positively to the technology and highly encouraged other teachers to utilize *Celly*. The only request received was to send the reminders out earlier the day before the deadline. It is recommended that instructors utilize the *Celly* app for sending/receiving messages and utilize the *Celly* website to schedule reminders.

126

A First Year Research Experience in the Large Undergraduate Classroom

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Typically, the first year undergraduate student majoring in agricultural sciences is enrolled into a research-rich institution. Historically, faculty have taught the first year courses with a focus on providing students with a framework and the skills from which they can explore their academic science. While building these foundations is fundamental, first year students do not benefit from engaging in the research process. A research experience allows undergraduate students to better understand scientific literature, appreciate the peer-review process, determine an area of interest, and delve into their careers as researchers. But how can a first year research experience be implemented? With an enrollment of 260 first year undergraduate students in a lecture theatre, how can all students perform research? We set out to create a research process for students and identified several crucial steps in the research process that we wanted the students to discover including: creating a hypothesis, testing the hypothesis, summarizing and displaying data, searching the scientific literature, writing in a scientific manner, making conclusions, and citing and referencing properly. Working in groups of four, students created a hypothesis and then surveyed their fellow classmates' beliefs on the subject. The groups then searched the scientific literature to validate or refute the survey findings. The students presented their findings in a research poster. The experience culminated with the creation of 68 full-sized research posters that were put on display with pride at a poster session.

128

Mapping the Membership, Does it Help to Affiliate?

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Five years ago Texas FFA implemented affiliation by chapter, where by all students in agriculture classes become valid FFA members if the chapter chooses to pay a lump sum fee. The suggestion was made that agriculture students, not in FFA, under the old system would become active members with this more automatic membership. The researcher conducted a descriptive study

2015 NACTA Abstract Poster Presentations

using publicly available historical data to analyze trends in membership and activity levels across time and geography in one large membership state using state degree recipients as an indicator of participation level. The current largest chapters are, as expected in suburban and urban areas and the smaller chapters represent more rural and predominantly agricultural regions. The push for increased membership in the form of affiliation produced suburban and urban chapters with large memberships. The rural chapters have experienced much more modest growth or no growth at all. However in this cross section, when mapped, the top chapters ranked by percentage of membership who were awarded the state degree represented predominantly rural and strongly agricultural areas. The researcher suggests that, the current model geared to increase membership does not appear to be leading to an increase in percentage of active participation as defined in this study as was suggested with the push to affiliation. It has also been observed, through tracking the movement of specific teachers and with knowledge of teacher's lives, that advisors could play as large a part as anything in the number of degree recipients and overall participation levels.

129

Change of Plans: A Twisted Approach to the Traditional Microteaching Model

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Teaching is a creative process, but to be effective it is dependent on meticulous planning. Communicating to beginning educators the importance of detailed plans is a challenging endeavor. The purpose of this innovative teaching approach was to place students in a situation in which they would have to teach a peer's lesson plan in a microteaching laboratory. Lesson planning and delivery skills are areas of weakness pre-service teachers wish to improve upon before entering the workforce. This study set out to strengthen these areas of weakness with an innovative approach to the traditional microteaching model and measure the level of satisfaction with this assignment. Students enrolled in a multi-disciplinary teaching methods course (N = 43) developed a lesson plan with the intent being another peer having to actually teach the lesson. Students were able to ask questions to the plan's author and ask for more information, details, and content. In addition, students completed a satisfaction instrument on this new microteaching experience in relation to the traditional microteaching model they followed previously in the course. Results of the pre- and post-evaluation questions and satisfaction instrument

showed students gain a better understanding of the importance of planning and writing detailed lesson plans. There were challenges with this model including the assignment being too complicated, not writing the plan early enough for edits, and lack of content on the plan. It is recommended to strengthen the explanation and support provided to students for the successful implementation of this learning activity in future semesters.

130

Teaching Applied Physical Science in a Metals and Welding Activity

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Agricultural systems technology content provides a favorable context to integrate physical science and applied engineering principles. Often these principles are discussed in theory during lecture with laboratory exercises focused on technical skill development. At Utah State University, students' evaluations of an agricultural welding course indicated a need for connecting physical science content to welding lab practicums. This study sought to describe the impact of a hands-on metallurgy activity on evaluation outcomes. The population of this study was 38 students enrolled in a beginning welding course at Utah State University during the fall of 2014. Square tubing was tack welded to a piece of flat stock and then secured in the horizontal position. A laser pointer was attached to the opposite end of the square tubing so the laser would be parallel with the ground. Students were asked to perform a weld sequence to fuse the flat stock base to the square tubing. Students made observations on the direction and distance the laser moved on a fixed bulls' eye target during welding and subsequent cooling. Thermal expansion, shrinkage, warping, and weld stresses were then discussed with students using their welding observations. Using "IDEA" online surveys, results showed a seven point increase on progress made towards relevant objectives. Positive comments indicated appreciation of the hands-on class activities with a desire to focus more on diagnosing welding technique to reduce distortion of weldments. A recommendation for future activities would be the integration of inquiry-based methods with this activity to assist students with troubleshooting weld techniques.

131

Using Cases in an Online Sustainable Agriculture Course

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Online teaching continues to increase in institutions of higher learning as students seek to manage their times effectively and find alternate ways to receive an education. While this method provides the convenience of being engaged in courses at any time, the type of course delivery must be amenable to student learning to attain the desired outcomes. One such technique is using cases, a cooperative learning strategy, recognized as an effective teaching tool, particularly in the business field. Case studies are real problem situations and thus can promote critical thinking of students. The objective of this report is to describe and assess the practice of using cases in an online course, Current Issues in Sustainable Agriculture, in fall semester 2014. The course with 13 enrolled students was comprised of three cases worth 42.5% of the grade. In the first two cases, students collaboratively and singly analyzed situations related to sustainable poultry and swine production, and composting of human manure for fertilizer for food gardens. For the third case they collaboratively wrote a case based on guided directions from the instructor. Analysis of the two assigned cases proceeded according to course schedule. However, writing of the case was a challenge as substantial amount of time was spent struggling to come to a consensus on a topic for the case. Future offering of this course should include more time for the case writing and inclusion of synchronous class discussions on the instructions for cases.

134

Effect of Colored versus White Paper on Student Exam Performance

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A study was conducted to analyze what effect that the use of colored paper may have on student exam scores. In a large classroom setting, traditionally an instructor will give two versions of an exam to discourage cheating. Normally the only variation is the order in which the questions appear on each exam version. Oftentimes the different versions may be printed on two different colors

of paper. This experiment aimed to take a closer look into how variation of exam paper color, light blue in this study, may affect exam performance when compared to traditional white paper printed exams. This experiment was conducted over one semester in an Introduction to Agricultural Engineering course consisting of approximately fifty students (n=50). Data from a total of four exams, including a comprehensive final, was collected and analyzed. Students received alternating exam paper colors. For example, a student that took exam 1 on white paper took exam 2 on light blue paper. The student then completed exam 3 on white paper again and took the final exam on light blue paper. Order of questions varied between the colored and white printed paper exams as well, but all questions were identical. Using a paired t-test ($\alpha=0.05$), data revealed a significant difference between exam results for individual students between colored exam paper and white paper. There was no significant difference in the overall class scores.

135

Millennial Alumni Perceptions of Communications Media Used by the Dale Bumpers College of Agricultural, Food and Life Sciences

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Alumni relationship cultivation serves as an important component of higher education and must be maintained to keep alma maters connected to graduates. To evaluate the success of communications media reaching recent Millennial graduates, researchers assessed alumni perceptions of media distributed by the Dale Bumpers College of Agricultural, Food and Life Sciences (Bumpers College) from 2012 through 2014. Assessed media included alumni magazines, an e-newsletter, key event invitations, College website, and social media presences. Active and inactive alumni responses were gathered via telephone interviews and qualitatively analyzed for emergent themes. Researchers identified *Building the Professional* and *Interest in Giving Back* as emergent themes related to respondents' connection to the Bumpers College. Five additional themes emerged related to assessed media and included *Message Relationship*, *Specialized Content*, *Communications Medium*, *Message Barriers*, and *Need for Promotion*. No alumni were dissatisfied with their collegiate experience and favored monetary donations for its convenience. Alumni sought a personable angle with all communications media and were drawn by updates about the College's research and global impacts. Respondents consumed print

2015 NACTA Abstract Poster Presentations

and digital media differently with engagement based on personal preference and flexibility. Subthemes emerged related to *Message Barriers* and included time, distance, vague messages, too much information, non-relatable subject matter, technical errors, and outdated information. Finally, there was little brand recognition between Bumpers College and University messaging, and most alumni were unaware of the College's social media presences. While findings revealed Bumpers College made an impression on participants as students, media must be adapted to meet Millennial alumni preferences and assist them in transitioning from inactive alumni to active.

138

Student Evaluations of a Problem Based Learning, Large Animal App for iDevices

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It has become increasingly more challenging to train large animal veterinarians due to the declining numbers of food animal and equine cases at many veterinary colleges. It seems logical that preserving cases in an interactive fashion could significantly contribute to teaching veterinary medical students. The iVetSchool App, developed by the investigators, uses media rich, clinically based case studies to train students in a problem based learning format. The App was used to teach two cohorts of veterinary medical students (n=220) during their second year. A key point to the efficacy of this App and approach is that students must enjoy the format of the training and want to continue its use. Therefore, students were asked to evaluate the App at the end of the semester with a survey. The survey contained two scales each comprised of four Likert scale items and seven open-ended questions designed to illicit deeper insight into the students' perspective regarding the App. The students had an overall positive response (3.6/5) that they enjoyed using the App and that it helped them learn relevant material. Positive comments about the App included that students were able to work at their own pace anywhere and anytime with nearly 25% of the students volunteering that they enjoyed the variety of cases available. The most common criticism of the App was that stu-

dents did not always like the way their answers were scored. The overall student evaluation of the App was positive and warrants further integration into veterinary curricula.

141

To What Extent are Hispanic Students Underrepresented in Texas Colleges of Agriculture?

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Hispanics are one of the most rapidly growing demographic groups in the United States. However, Hispanics enroll in and complete higher education at disproportionate rates when compared to other racial/ethnic groups, and this disparity is greater in the food, agricultural, and natural resource sciences (AFNR). Consequently, the National Research Council recommended colleges of agriculture recruit and prepare more historically underrepresented students. Nonetheless, the literature lacks data showing the extent to which Hispanics are underrepresented in agriculture. Therefore, the purpose of this study was to examine Hispanic AFNR enrollment in Texas as compared to area and state demographics. Data for 11 colleges of agriculture were downloaded from the FAEIS website for the fall 2011 semester; this was the most recent year with complete data. The 2010 U.S. Census was used to determine the percentage of college-aged Hispanics in Texas and areas surrounding each university. Results showed that 43.23% of the college-aged population in Texas was Hispanic, whereas, Hispanic enrollment in colleges of agriculture was 12.03%. Among individual universities, Hispanic enrollment in agriculture was 17.91 to 39.95 percentage points lower than the percentage of college-aged Hispanics. Additionally, Hispanic enrollment in agriculture was 5.90 to 50.74 percentage points lower than the percentage of college-aged Hispanics in each university's surrounding area. When compared to state and area demographics, Hispanics are substantially underrepresented in Texas' colleges of agriculture. Therefore, a continued emphasis should be placed on recruiting and graduating Hispanic students and examining and reducing barriers unique to Hispanic student enrollment.

2015 NACTA Abstract Poster Presentations

143

Challenges and Opportunities for Underrepresented Agriculture Students in Obtaining USDA Job Training in the STEP UP to USDA Career Success Program

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Texas A&M University-Kingsville developed a program to engage students in scientific research or career experience and better qualify for USDA employment. This program is one of seven USDA/NIFA Collaborative Projects and it bridges Associate (AD) and Baccalaureate degree granting (BD), Hispanic Serving Institutions. Undergraduates ($n = 241$) received training at USDA Agencies, scientific research experience, or other career training within agriculture. In year one (YR-1), 31 AD- and 35 BD-students participated. The majority of students (54.5%, 36/66) participated in research and 34.8% received USDA career training. Students in YR-2 (AD =25, BD=41) were successful in obtaining USDA internship experiences (45.45%, 30/66) whereas in YR-3 (AD=25, BD= 43) success was intermediate (39.7%, 27/68) to YR-1 and YR-2. The greatest success in obtaining USDA Agency internship experience occurred in the current year (YR-4) of the program. Presently 41 BD students are participating in STEP UP and 63.4% (26/41) obtained a USDA internship for summer of 2015. Students were also placed in other agriculture internships in YR-1 (10.6%), YR-2 (9.1%), YR-3 (13.2%), and Yr-4 (9.76%). Despite a plethora of USDA agencies and a usajobs.gov website, obtaining USDA job training internships for underrepresented agriculture students is a challenge. We attribute our success in YR-4 to maturity level of the BD vs. AD students; personal relationships established with USDA agencies, and a strong track record and work ethic of previous STEP UP students. We have shown that the STEP UP to USDA Careers has successfully trained underrepresented students to increase workforce diversity and encourage successful graduation.

144

Examining Rapport, Student Satisfaction, and Learning Gains in an Undergraduate Research Experience

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Undergraduate research experiences (UREs) benefit students by increasing academic success, interest in science, and understanding of research. Furthermore, students' interactions with faculty are an essential piece of the URE. Student/faculty interactions have been an important factor predicting student success; however, research has mostly focused on quantity of interactions. Rapport as a measure of interaction quality and its relationship with student satisfaction and learning in the URE has not been studied as extensively. Therefore, the purpose of this study was to examine relationships among mentor/mentee rapport, student satisfaction and learning gains. This study utilized a census of undergraduate researchers participating in the McNair Scholars Program at Sul Ross State University during summer 2014 ($N = 15$). Rapport consisted of two constructs, student engagement and perception of mentor. Results showed both constructs had substantial to very strong, positive relationships with gains in specific facets of research, as well as enjoyment of the research process. However, constructs had low/negligible relationships with gains in understanding the overall research process and readiness for more demanding research. The constructs also had low/negligible relationships with satisfaction of the McNair experience and perceived educational value. Perhaps mentors were adept at building rapport, but spent time focusing on specific research tasks instead of creating a broader learning experience. It is plausible students enjoyed the research tasks, but expected more from the experience. This might explain why rapport was not related to overall ratings of the McNair experience or perceived educational value. Mentors should consider providing a holistic research experience for undergraduate researchers.

145

Understanding what is Important to New Students: Goal Setting in an Animal Science Freshmen Orientation Course

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Freshmen majoring in Animal Sciences & Industry ($n = 227$) were required to complete a personal assessment by identifying five strengths and five weaknesses as they entered their first semester. Following completion of this assessment, students were required to identify three to five goals. Students were instructed to identify goals that were clearly defined, specific, challenging and measurable. Most students ($n = 161$) identified a specific grade point average (GPA) goal. 172 students cited short-term

2015 NACTA Abstract Poster Presentations

goals only, while 42 students cited both short and long-term goals and 1 student cited long term goals exclusively. Examples of goals cited included becoming involved on campus, staying organized with classes, meeting new people, and post-graduation career goals. Students assessed their progress toward goals at mid-semester (week 8) and prior to final examinations (week 15). Students reported whether goals were accomplished and reasons for their success or lack of progress. Copies of the initial assignment were distributed to the students' advisors during week three, with copies of the goal assessments distributed after week 15. Twenty-four percent of students achieved or exceeded their GPA goal. Fifty-three percent of students earning a GPA of 2.5 or less completed all aspects of this assignment, while 98% of students earning a GPA of 3.5 or greater completed all aspects of this assignment. Not surprisingly, assignment completion appears to be a good indicator of academic success and, in this group of freshmen, students were more focused on the upcoming year than they were on beyond-graduation events.

148

Using the Flipped Classroom to Develop 21st Century Employability Skills: Merits, Limitations and Strategies

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The flipped classroom has garnered significant attention in the educational community. In a flipped classroom, lecture and homework components are reversed. Students receive course content at home, and in-class time is filled with discussion, activities, and projects. Despite widespread awareness of this model, there remains debate on its efficacy and uncertainty around how to implement the model in a manner that fosters the development of skills identified as crucial in today's workforce: problem solving, critical thinking, teamwork, and collaboration. Constructivist theory posits that learning occurs at the intersection of experience and ideas. Students learn best when they generate knowledge through social interaction and active learning. Yet, the passive model of regular face-to-face lectures has been the standard for course delivery for decades. This model has largely failed to prepare graduates to thrive in today's workforce, creating a "workforce readiness gap" that requires company investment to bridge. The flipped classroom challenges this prevailing model. Its inverted format "means that students are doing the lower levels of cognitive work outside of class, and focusing on higher forms of cogni-

tive work in class..." where instructors can provide immediate feedback. While this can lead to better relationships, greater engagement, and higher motivation, the flipped classroom is not easily implemented due to the range of technical skills, conceptual knowledge, and pedagogical expertise required. These strategies, benefits, and limits of the model will be the focus of our presentation.

150

Tours for Empowering Future Professionals

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Experiential-learning opportunities have been shown to contextualize student-classroom learning in a way that allows students to practice using and engaging their knowledge in real-life situations. For this study, over 100 agricultural communication students participated in a professional development conference and a tour of farms to further enhance their preparedness for their future careers. Students interacted with farmers, producers, and professionals and learned about the history, opportunities, barriers, and future of the agricultural industry. Students were asked to complete a questionnaire about their experience on the tour and were prompted to reflect on their thoughts about the agricultural industry prior to the tour, after the tour, and how they believed their future careers could be impacted by what they learned on the tour. The results were analyzed for common themes. Respondents indicated that the tour helped to reconstruct their beliefs of agriculture and the tour strongly impacted their perceived importance of communication in the agricultural industry. Respondents also indicated it was not the educational component that made an impact on their beliefs, but the ability to tour the facilities and directly speak to the industry representatives. Thus, suggesting relevant contextual and experiential-based learning, combined with the direction of competent educators, strongly impacted learning and influenced future career directions. These findings suggest experiential-based opportunities, namely tours, may empower students to visualize themselves as future professionals and strengthen their commitment and overall passion for their future career when given the opportunity to interact and engage with current professionals outside of class.

2015 NACTA Abstract Poster Presentations

151

Creative and Innovative Nutrition Lesson Plans: Backward Design, Instructional Strategies and Florida Standards

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Nutrition professionals often develop nutrition lessons for grades K-12; however, these professionals typically do not have a formal background in K-12 education and have not been taught how to develop lesson plans that align with required standards and discourse familiar to K-12 teachers. The purpose of this project was to teach future nutrition professionals how to develop lesson plans that align with K-12 standards, discourse, and strategies. Students enrolled in the University of Florida's Master of Science-Dietetic Internship Program were tasked with developing nutrition education lesson plans for K-12 students that were rooted in empirically-based research in teacher education and pedagogy. To achieve this goal, a series of "guest lectures" and a critique of the lessons developed were provided by a Curriculum, Teaching, and Teacher Education Doctoral Candidate from the University of Florida's College of Education (COE). Lesson plans included the following topics: Backward Design, Florida Standards (FS), and learning strategies. The lessons developed were evaluated by nutrition faculty based on a rubric to ensure high quality nutrition content and coherence. Additionally, the COE Doctoral Candidate reviewed the lessons to determine alignment with Backward Design, FS, and learning strategies taught in class. Backward design was evidenced by the inclusion of a literature review. All lessons included appropriate instructional strategies and accommodated visual, kinesthetic, and auditory learning preferences. The FS listed were appropriate and aligned with the lesson. Partnering with education professionals is an approach that can be used to ensure the development of lessons that match expectations for K-12 curricula.

153

The Cooperating Teacher Component: Exploring Effectiveness

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Perhaps the most significant aspect of pre-service teacher preparedness is the student teaching experience, and the cooperating teacher plays a critical role in the process. We sought to identify which characteristics define an effective cooperating teacher in agricultural education. We utilized Roberts' Model of Effective Cooperating Teachers and the Delphi methodology to identify characteristics of effective cooperating teachers from expert panels of agriculture educators in four states. The resulting panels included 16 teachers in Missouri, 14 teachers in North Carolina, 14 teachers in Oregon, and 15 teachers in Texas. The data collection proceeded separately in each state. Round one included an open-ended question identifying personal and professional characteristics perceived as essential to being an effective cooperating teacher. During the second round, participants were asked to rate each item for their state's round one results, as well as make any revisions or additions to the list. Finally, in the third round, participants were asked to agree or disagree with each item. The findings revealed nine themes, which define cooperating teachers: Hard Worker, Relational, Communicator, Motivator, High Moral Character, Mentor, Program Planner, Effective Teacher, and Professional. We found similarities between these themes and those identified by Roberts. Given the larger sample size, it is logical that more characteristics were identified in this study. Additionally, we propose a new model to define the characteristics of effective cooperating teachers and recommend teacher educators work to create an assessment using these characteristics.

154

Change in Student Values after Completing an Academic Community Engagement Course

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Academic Community Engagement (ACE) is a classroom enrichment that combines community engagement with academic instruction. The ACE initiative at Sam Houston State University requires students to engage in 9 hours of community service for designated courses. The service venue is selected by the student and approved by the instructor. The value of service learning in higher education has been well documented. Investigative enquiry has shown more positive comments on course evaluations, positive change in student value system toward service/community engagement, with higher academic achievement as measured on mid-term and final examinations. Additional research supports the contention that service learning has a positive impact on personal, attitudinal, moral, social, and cognitive outcomes. In the fall of 2014, 162 undergraduate students (65% female, 55% 17-20 years of age) in three different ACE courses completed pre/post surveys polling beliefs and viewpoints of community service. Students ranked questions on a scale of 1 to 5 (1 strongly disagree, 5 strongly agree). Data from surveys were analyzed using the GLM procedure in SAS to determine change in student perception of service. Of the 18 questions, 1 question was significant ($p=0.02$); students responded with a higher score and indicated they would continue their serve after this course. Though not different ($p=0.07$), a trend was noticed of students signifying that their service activity assisted in defining their type of work in the future. These ACE courses supported data that service activities, associated with academic learning, enriches students' value system by continuing their service activity once the course was completed.

155

Hispanic Agricultural Education Students' Career and College Plans

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Throughout the nation, universities continue to place great emphasis on the recruitment and retention of underrepresented students. However, we continue to see a sharp contrast between the enrollment percentages of white students versus students of color, and enrollment numbers in agriculture and related fields are not immune. While efforts to correct this continue, we must address the root causes of these challenges, one of which begins at the secondary level. The purpose of this study was to examine the future career interests of high school students by ethnicity. Specifically, this study: (1) describes the future career interests of Hispanic and non-Hispanic high school agricultural education students, and (2) analyzes respondents' career preferences by ethnicity. Secondary agricultural education students from four high schools in California ($n = 920$) were asked to participate in a questionnaire seeking their future career objectives and post-secondary plans. Overall, the data showed Hispanic students indicated a desire to attend a four-year institution or community college at a much higher rate (77%) than non-Hispanic students (60%). Despite this finding, Hispanic respondents indicated a future agriculture career at a much lower rate (8%) versus non-Hispanic students (28%), though 50% of Hispanic students indicated they were unsure. A qualitative investigation of these numbers shed light on possible causes, including Hispanic students' perceptions toward agriculture and a lack of positive role models. The findings help illuminate the need for more targeted recruitment by colleges and universities at the secondary level while providing useful insight on secondary students' post-secondary plans.

156

Needs and Expectations of Stakeholders for an Agricultural Academic Department Website

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Universities and academic departments rely on websites in increasing capacities to engage their stakeholders. Millennial students view websites as a primary source of information with increasing frequency. Agricultural educators and colleges of agriculture, as well as other units of higher education, should continue to engage these students digitally. Effective website design considers user needs and expectations. The purpose of this study was to identify the user needs and expectations of an academic department website, specifically a website for a department of agricultural education, leadership, and communications. Two focus groups were utilized to conduct a qualitative case study. One group comprised of

2015 NACTA Abstract Poster Presentations

graduate and undergraduate students and one group comprised of faculty and staff to identify unique needs and expectations of an academic website. The constant comparative method was employed to identify emergent themes in the data. Identified themes generated from the student focus group data were people, pictures, customization, less is more, and up-to-date content. The themes emerging from data generated from the faculty and staff focus group included scholarship, words, consistency, more pathways, and up-to-date content. Thus emerged a taxonomy of opposites: people vs scholarship; pictures vs. words; customization vs consistency; less is more, and more pathways. Recommendations for practitioners include creating specific digital experiences for specific audiences. Additionally, up-to-date content is essential, and following any redesign of a website featuring user-centered design, a usability study should be employed to measure effectiveness and functionality of the design.

157

Teaching Best Management Practices to Secondary Agriculture Students

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There are numerous Best Management Practices (BMPs) for the nursery industry; however, there has been no accounting of which practices are most used and most effective. Additionally, the scientific justification for the use of BMPs in Virginia has not been consolidated. Horticulture teachers at the secondary level do not have access to these emerging findings, and presenting this research to secondary students helps students understand BMPs and the effects they have in improving efficiency while reducing environmental impacts of agriculture. The research determines which BMPs have been adopted by nursery growers in Virginia, to research barriers to BMP adoption, and to conduct a metadata analysis (i.e. a statistical analysis comparing data in the literature) to determine the efficacy of selected BMPs. The research will directly involve growers through interviews and focus groups to provide evidence supporting BMP use in Virginia. Research results will be published in a report that will be accessible to both regulators and growers. The Graduate Extension Scholars program in the College of Agriculture and Life Sciences at Virginia Tech uses a collaborative approach to bringing emerging research such as this into the classroom. Graduate students are paired with agricultural educators and 4-H agents to develop educational materials that bring new

research to the forefront for secondary students. Through the Graduate Extension Scholars program, a new module is created in which students engage in a design challenge to learn about BMPs used to increase efficiency and cost effectiveness in the nursery industry while reducing environmental impacts.

158

Toward a Concentric Model of Change: Completing a Model of Holistic Human Development

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Study abroad participation continues to increase across the nation; therefore it is important for educators to understand how this experience changes a student. The purpose of this study was to develop a model of student change, based on participation in a study abroad. The theoretical framework for this study included Keegan's model of holistic human development, which posits that learners change in three domains: Intrapersonal (feeling), Interpersonally (relating) and Cognitively (thinking). Keegan's model showed overlap between domains through concentric circles; however the model did not define nor characterize that overlap, leading to gaps in the explanatory power of the model. This study expands upon a larger study describing three distinct viewpoints of student change from study abroad: collaboration, confidence, and contextualization. In this study, distinguishing statements of those viewpoints were thematically organized according to Keegan's domains. A proposed model was created to expand the explanatory power of Keegan's model. Collaboration was found to associate with cognitive and interpersonal domains, and was represented in the overlap between them. Confidence associated with interpersonal and intrapersonal, and was represented as overlap between those two domains. Contextualization associated with all three domains, and was therefore represented in the model as the central overlap. Thus, the new proposed model defines previously unexplained areas of Keegan's model. Practitioners should use these results in planning high-impact experiences. Further testing of the model should enhance understanding and potentially define one remaining unexplored overlap.

2015 NACTA Abstract Poster Presentations

160

Enhancing Classroom Learning Through Experiential Collaboration: Development of Farm Credit Fellows

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Enhancing classroom learning and providing experiential learning for students is a continuous battle for educators. The problem is exacerbated in agricultural degree programs where students are often expected to return home each summer to work on family farms and are unable to complete a traditional summer internship. Collaboration with industry partners provides an efficient method to address these issues. North Dakota State University has partnered with AgCountry Farm Credit Services to develop the Farm Credit Fellows program. The objective of the program is to provide a flexible experiential learning course that incorporates classroom learning and real world problems provided by an industry partner, AgCountry Farm Credit Services. Students participate in multiple meetings at AgCountry. The meetings provide an opportunity for the students to analyze problems in a non-traditional classroom setting. Two years of student evaluation survey data provides the student assessment of the program. The presentation will focus on the development, issues faced, innovative approach, effectiveness of the program, synergy within current Agribusiness curriculum, and further extensions for this type of program.

161

Exam Score Determinants in an Undergraduate Agricultural Economics Course

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Students, particularly first-year students, frequently ask faculty about what they can do to improve their performance on exams in introductory classes. In an effort to statistically document the advice given, student characteristics and behaviors as provided by students throughout the semester are used to explain variation in examination scores. Of the 235 students enrolled in two sections of introductory agricultural economics taught in Fall 2012, data on 193 were sufficiently complete to estimate a generalized least squares model with percentage of

examination points earned as the dependent variable. Independent variables include age, instructor, major, transfer from two-year school, hours earned, ACT composite score, algebra and calculus background, gender, number of weeks old exams were reviewed, number of weeks web-based materials were accessed, percentage of participation points earned, and percentage of classes attended. The results suggest that ACT composite score and class attendance are the two leading factors positively related to examination score. A student with an ACT composite score one standard deviation above the average, or very close to 28, should expect to see their exam percentage increase an additional 5.9 points based on their prior performance on the standardized collegiate entrance exam alone. Students that regularly attend class and participate enough to increase participation percentage by one standard deviation above the average will realize an exam score percentage increase of 3.5 points. The R-square for the equation is .568 prior to heteroscedasticity correction and .966 after correction for heteroscedasticity.

162

How Efficacy and Professional Development Support Affect Integration of Other Subjects in a Formal Agricultural Education Classroom

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The purpose of this case study was to examine the phenomenon regarding how agriculture education teacher's efficacy affected integration of Science, Technology, Engineering, and Math (STEM) and the Next Gen Science Standards (NGSS) into their classroom teaching. This case study consisted of agriculture education programs in the Eastern United States who taught in a state that provided input and resources on the design and writing of the NGSS with hopes that it would be implemented in the future. Participants participated in monthly-recorded audio interviews using a semi-structured interview guide and provided artifacts for the researchers to examine. Data was coded using an open and then focused coding scheme using Atlas.ti®. The analyzed data showed two major themes: teacher efficacy and support from others. Specifically, if the teacher didn't feel confident in the implementation of STEM concepts, they were less likely to want to integrate the NGSS in their classroom. Teachers also reported that they needed to feel supported from their administration, state agriculture education organization, and land-grant institution. The researchers recommend that ongoing professional de-

2015 NACTA Abstract Poster Presentations

velopment from the school and professional development organization to be more deliberate. In addition, the integration of other subjects is necessary to keep agriculture education programs competitive as a valuable curriculum within the pre-k-12 system.

164

Influential Recruitment Factors for a Midwestern College of Agricultural Sciences

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Student enrollment remains a top priority for our college and university. The college recruitment efforts are various and scattered in approach, therefore a sliding scale (0-100) survey was offered to 88 freshmen enrolled in the college to assess recruitment approaches and their influence on enrollment. Future Farmers of America (FFA) participation had measurable impact with 43% of respondents having participated in FFA sponsored events. Further analysis indicated that FFA national convention, state convention and career development events had the greatest impact on their decision to enroll (54.3, 53.5 and 54.9, respectively). Getting prospective students on campus yielded the greatest impact with 77% of students having participated in on-campus visit or events. Further analysis indicated that individual campus visits (75.9), admitted/prospective day on campus (45.1), and the Chancellor Scholar weekend (30.2) had the greatest influence on their decision to enroll. Only 27% of respondents participated in off campus functions. A high school visit by an Agbassador (an undergraduate liaison for recruitment) had the greatest influence (20.1), followed by a university visit at a community college (16.7) and representation at the Illinois Horse Fair (15.3). Eighty six percent of respondents received direct mailing from university admissions office, 60% received mailings from the college and 14% did not receive recruitment mailings. While college presence at FFA functions and Agbassador visits to high schools influence undergraduate recruitment in a positive manner, individual campus visits no matter the reason yield the greatest influence over enrollment decisions.

165

Evaluation to Improve College Teaching: Going Beyond the Student Evaluation Instrument

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Ideas for improving one's teaching come from many places - self-study, self-reflection, seminars, presentation, and student evaluations. Student evaluations can be quantitative in nature; however, the literature is replete with studies indicating that this is a poor measure of the teacher's ability to facilitate learning. A potentially better source for ideas to improve a course or one's teaching style is to purposefully ask the students with several contact points. An instructor of an introduction to sales course was evaluated through a mixed methods process. The process includes four rounds of administering a survey to the whole class and each questionnaire is followed by a focus group of students. A two page survey will be administered in class at weeks five, eight, eleven, and sixteen in the semester. The first survey-focus group round identified a barrier that pop-quizzes have to learning. If students know a quiz is scheduled, they will take the time to engage the material in a meaningful way. A second finding has been that some assignments cause anxiety for students, including a ride-along with a salesperson. The project will yield two types of implications: One is an evidenced-based method for evaluating instructors that can be replicated; another is a series of generalized lessons learned across instructors. Both implications will leave the academy in a better position to improve teaching and learning in higher education.

168

Who Fills the Seat: Student Perception of Current and Contemporary Issues Facing Food and Animal Agriculture

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For students enrolling in Animal Science courses, it is important to understand their background and incoming perception of issues facing food and animal agriculture as the following question needs to be addressed: does the current Animal Science curriculum allow for incoming students to appropriately explore, comprehend and understand the complexity of the issues facing food and animal agriculture? In the fall of 2014, demographic and perception of contemporary issues surveys were administered to students (n= 333) in Introduction to Animal Science at OSU. Of the respondents, 58% indicated involvement in youth agricultural organizations prior to enrollment at OSU and 42% had no prior involvement in youth agricultural organizations. The issues survey was administered pre- and post-course. Students (n=299 of 333) responded to questions pertaining to their opinion

2015 NACTA Abstract Poster Presentations

(*strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree or strongly disagree*) regarding animal welfare, food safety and animal husbandry practices. The pre-course survey revealed 47% of respondents *somewhat* or *strongly disagree* with the statement: *meat from animals treated with hormonal implants is safe to eat*, while 33% *somewhat* or *strongly agree*. The post-course survey showed a shift from *somewhat* or *strongly disagree* (15%) to *somewhat agree* or *strongly agree* (71%). When responding to the statement: *the use of gestation stalls in the swine industry is acceptable*. A shift occurred from pre- (33%) to post- (71%) in those who *somewhat* or *strongly agree*. Initial results of the survey indicate the underlying knowledge base of incoming students could aid in reevaluating current curricula.

171

Self-efficacy Assessment in a PreVeterinary-track Professional Development Course

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A unique professional development course for PreVeterinary track students (ANS 281) was developed in the Animal Science Department at the NC State University in 2011. It was offered to the PreVet students during with the two-fold objectives (a) educating students about the expanse of veterinary profession and (b) assist students in developing an understanding of the DVM application procedure. Students were surveyed for significant gains in PreVeterinary career path self-efficacy following their participation in the professional development course in Spring 2014 and 2015. The 46 students were also surveyed on the level of confidence in their decision to apply to veterinary school and become a veterinarian. Results revealed that students reported a significantly higher confidence $t(45) = 13.17$ in explaining what a lab animal veterinarian did and in assessing the current issues facing the veterinary professions $t(45) = 11.97$ ($p < 0.001$). It was evident that students had an existing understanding of the job profile of a large animal veterinarian. The course assisted in 62% of the students in becoming from "somewhat confident" to "reasonably confident" in their decision to becoming a veterinarian. This study helps us understand how career development courses can affect career decision making process among PreVeterinary track students.

174

Investigating Students' Experiences at a Professional Development Conference

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Professional development opportunities help students gain hands-on experience and skills they need to be successful global leaders. The purpose of this study was to investigate college students' experiences and development at the 2015 National Agricultural Communicators of Tomorrow Professional Development Conference. Conference participants ($N = 19$) completed prelection and reflection exercises as a means of documentation. The qualitative data were analyzed using analytic induction—process of using a well-documented theory as an analysis framework. Chickering and Reisser's theory of education and identity outlined seven vectors of college student development that are supported by environmental influences (e.g., extracurricular activities). Participants experienced development in all seven vectors—developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, developing purpose, and developing integrity. However, much of their development aligned with *developing competence*, *developing mature interpersonal relationships*, and *developing purpose*. Because of their experience at PDC, students believed they strengthened their network and, as a result, are more prepared to be leaders in the agricultural industry. Additionally, students were able to make connections between their coursework and industry standards. To assist students' in their development, educators must recognize and create educationally sound environments that include structured and unstructured learning opportunities. Because environmental influences play a significant role in the college experience, facilitators of extracurricular activities should consider incorporating opportunities that contribute to students' psychosocial development. Further research needs to be conducted to determine if participation in professional development activities is an indicator of career success and achievement.

180

Agricultural Policy Influencers' Preferred Methods of Communication: Helping Educators Prepare Students to Impact Agricultural Policy

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Agricultural policy influencers play a vital role in the development of sound agricultural policy; they represent the agricultural industry to elected officials. Understanding the flow of communication among agricultural policy influencers is important to impacting future policy. The purpose of this study was to describe how agricultural policy influencers prefer to communicate with each other. Two separate Delphi studies were administered to determine preferred methods of communication between two target groups. This study followed the Delphi process where participants were selected by their position with the goal of gathering expert opinion. The two groups of experts were leading Congressional agricultural aides and leading agricultural lobbyists. Each Delphi study consisted of three rounds administered through Qualtrics. Consensus was developed for preferred methods of communication. Between the two groups, the data pointed to the importance of interpersonal relationships during the communication process. Preference for communication methods differed based on how often the two parties communicated. Preferred communication methods included written communication in the form of email and verbal communication in the form of in-person meetings and phone calls. These findings offer important lessons for educators of agricultural students. To prepare students to impact agricultural policy, educators should teach students interpersonal relationship skills, how to develop a connection with their peers, and how to develop a personal network. In addition, educators should teach students how to communicate professionally through written communication. By developing these communication skills in agricultural students, educators can help to prepare them for a career in agricultural policy development.

182

Utilizing Snapchat to Prepare for Career Development Events

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Incorporating technology in the post-secondary classroom can aid in engaging students in unique ways. Many students are involved in various social media applications on a daily basis. The purpose of this study was to test the effectiveness of utilizing an image-based social media application, Snapchat, in preparing students for the identification portion of Career Development Events (CDEs). Many CDEs include an identification portion to the contest, and teachers in the secondary classroom often struggle developing an effective training strategy. Snapchat for CDE preparation was field tested by pre-service and in-service teachers in the spring of 2014. Pre-service teachers noted that the idea was an extremely unique way to incorporate social media technology into the teaching and learning process. Current in-service teachers reported faster retention of identification components to various CDE's offered through FFA. One current in-service teacher reported less time spent focusing on the identification portion of CDEs and better identification knowledge retention. Snapchat is a free social media application available for smartphones and tablets. Users of this free application must have an active email address. Data usage or wireless access is required to utilize the Snapchat features. Fees for data or wireless access on wireless technology vary with each provider. Aside from the costs of owning a smartphone or tablet, costs associated with this CDE preparation technique are minimal. Costs associated with traditional preparation for CDE identification portions of various contests could potentially outweigh the minimal cost associated with incorporating technologies such as Snapchat into CDE preparation.

184

Joint Ventures in Agriculture: A Novel Approach to an Agricultural Policy Course

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The objective of this innovative idea poster is to outline a unique course taught at North Carolina State University. AGI195/ALS495 "Joint Ventures in Agriculture" is a two hour credit-only course that is a unique partnership between the NC Department of Agriculture and Consumer Services and NCSU. The NC Commissioner of Agriculture and the Dean of the NCSU College of Agriculture & Life Sciences co-teach the course blending the unique perspectives both have on the agriculture industry. The course meets once a week for three hours with a variety of field trips, panel discussions, and group presentations. There is a strong agriculture policy theme that is evident from the tour of the NC general assembly in downtown

2015 NACTA Abstract Poster Presentations

Raleigh to the representation of commodity group leaders as guest speakers. The course was offered for the first time in the spring of 2015 to 35 students; 19 university track (4 year bachelor degree) and 16 institute track (2 year associate degree). Students are immersed in the trends and issues of modern agriculture and constantly challenged to think about ways to impact the industry in a leadership role. Weekly topics in the course include: food safety, agricultural research, leadership, biotechnology, agricultural marketing, etc. To receive credit students are required to record a reflection each week and complete a semester long group project that includes a research paper, structured interview, and presenting findings to the class. The course is a conduit for experts, researchers, and state/national leaders to prepare the agricultural leadership of tomorrow.

186

Instructors' Understanding of their Qualities that Support Student Engagement: A Phenomenological Study of an Agriculture Field Course

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Field course are an important part of college students' agriculture education. Their interdisciplinary and practical nature offers students a chance to experience content topics in a real-world setting, with the accompanying complications and uncertainty that is inherent in the work these students will do every day as graduates working in agricultural systems. This phenomenological study investigates the philosophies and meaning-making of the four instructors of an agro ecosystem analysis summer field course based on open-ended cases. The unique attributes of each of the instructors – their agricultural and educational values and interests – as well as the synergy created by the four working together in a carefully organized way, combine to support students as they engage with farmers who are very different in their approaches to land management. Each instructor participated in a series of three open-ended interviews, focusing on the past experiences that informed their teaching, their present work in the field course, and their vision of the future for the course and their involvement in it. Analysis of the interviews and field notes revealed key elements to making open-ended cases work in this course: prior experiences with diverse cultures and perspectives among the instructors; a course design in which all four instructors co-facilitated each course experience; an accompanying trust between instructors; and a comfort level with students achieving diverse learning through the course experiences as well as with student

feelings of frustration and cognitive dissonance as they move through the course experiences.

187

iTeach: Building an Inter-University Veterinary Pathology Community of Learning

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Veterinary pathologists are veterinarians who have undergone a specialized two to three year residency following graduation from veterinary school. Most residents are required to teach at least one course during their residencies, regardless of prior teaching experience. The iTeach Program was a collaborative project between Texas A&M University, Kansas State University, and Iowa State University to improve upon veterinary pathology instruction. As part of this program, we developed a community of learning between the schools to bring instructional education to veterinary pathology residents using a monthly webinar series. Starting with Blooms Taxonomy, this lunchtime webinar series provided instructional education on a variety of topics from student engagement to peer observation and evaluation. The skills learned in this webinar series helped prepare residents for current teaching duties, future careers in academia or industry, client and peer communications, and veterinary outreach. Average participation at each site included six to 12 residents. Participating residents were surveyed before the webinar series, mid-way through, and following the last webinar. Eighty-nine percent of respondents indicated the webinar series increased their understanding of effective teaching strategies. Respondents also indicated they felt more secure in their abilities to incorporate classroom assessment techniques into their classrooms and improve teaching strategies as a result of attending the webinar series. The iTeach Program demonstrated a need and willingness to address the lack of instructional preparation for veterinary pathology residents. It also demonstrated the feasibility of using a webinar platform to connect several universities to share information within a community of learning.

188

Breadfruit Plants: Tools for Experimental Teaching and Learning

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Breadfruit (*Artocarpus altilis*), a traditionally staple crop in Hawaii, is grown for its starchy fruit and is one of the best crops for agriculture and food system. However, scientific information on breadfruit production and protection from common pests such as slugs and mealy bugs are unclear. Furthermore, teaching agriculture for undergraduate students through an experimental process is in its preliminary stage. Therefore, breadfruit plants variety "Ma'afala" grown inside the Shade house and in the Ulu grove (Ulutopia) were used as teaching tools to train undergraduate students in experiment processes such as designing experiments, recording data, and analyzing and presenting results. Shade house grown and slugs, and mealy bugs infested breadfruit plants were used to evaluate the effects of baiting and applying soapy water against slugs and mealy bugs, respectively. Ulutopia grown breadfruit plants were used for evaluating the effects of four different doses of a complete fertilizer, 16:16:16 NPK, (0 g, 151 g, 226 g, or 453 g/tree) on plant growth. Baiting slugs through Metaldehyde 3.25% pellets and keeping the baited slugs in 70% alcohol for 15 minutes saved 93.75% breadfruit plants (N=144). Spraying soapy water at 1% (v/v) reduced mealy bugs number ($P < 0.05$). The doses of fertilizer did not impact plant growth in one month ($P > 0.05$), but did show a trend of higher breadfruit plant growth after applying more amount of fertilizers. Implications of these results are that the experimental teaching could be incorporated in undergraduate students' education and breadfruit plants could be used as teaching tools in agriculture.

189

Are Judges Biased During Competitive FFA Events When Using Subjective Criteria?

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Career Development Events, for decades, have been an essential element in Agricultural Education as a method

of authentic assessment. Evaluating teams and individuals in these events is sometimes done by secondary agricultural teachers from other schools using an adopted score sheet. Such evaluation should be non-biased even though subjective evaluation is required. This research attempted to determine if there is bias in this evaluation by teachers (judges) from within a team's respective Area (Region or District is used in some states) at the state level. Texas State FFA Leadership Development Events results from 2010-2014 were examined. On an annual basis by event, Areas select judges from within their Area to judge at the state level. Teams compete in a semi-finals round and a finals round with ten teams per event and three judges per event. Average placings were calculated for teams with a judge from their respective Area and for teams without a judge from their respective Area in each of the eleven events. The findings indicate there is a statistically significant difference ($P < 0.05$), albeit slight, in the placing of a team based on whether a team is evaluated by a judge from their own Area. Such teams were likely to place higher than teams without a judge from their respective Area.

190

Agricultural Outreach Activities in Western Puerto Rico

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During the academic year 2013-2014 the College of Agricultural Sciences of the University of Puerto Rico-Mayaguez have been involved in K-6 outreach activities to promote the education and training of students from public elementary school in the areas of agricultural sciences as part of the Center for Education and Training in Agriculture and Related Sciences (CETARS) program. Funds for these activities have been provided by projects from NIFA-USDA and US-Department of Education. Ten public elementary schools from western region of Puerto Rico were impacted during the academic year by visits from participating UPRM agriculture undergraduate students. Students visited each school once a week for a period of one hour to organize lectures and workshops in topics related to agriculture. Also a vegetable garden was constructed and managed in each school to complement the outreach activities. A total of 218 (111M/107F) students at the 4th and 6th grade level were impacted during the academic year with hand-on experiences. Simultaneously two participating UPRM agriculture undergraduate students were in charge of organizing outreach activities at the kindergarten level, which involved in workshops and lectures in the areas of natu-

2015 NACTA Abstract Poster Presentations

ral resources, plant growth, plant nutrition and urban garden. These visits involved coloring activities using books developed by students and faculty impacting total of 237 K students. At the end of the academic year a half-day activity was organized called the Agricultural Tour to bring over 120 K-6 students to the UPRM Agricultural Farm and participate in hand-on workshops in the area of agriculture.

192

Student-led Facilitation: A Strategy for Class Engagement and Learning

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Student participation in class discussion can be challenging. A senior-level course has utilized student-led facilitation as both a teaching and learning strategy. It is a strategy that can also increase student engagement. Class sessions are divided between a presentation by a subject-matter specialist and a student-led facilitation for each topic of discussion. The subject-matter specialist "sets the stage" and the student-led facilitation delves deeper into the topic. Students prepare an instructional plan which includes learning objectives, learning activities/strategies, resource materials, and readings. Each facilitation team meets with the instructor one week prior to their facilitation to go over their plan. Readings are posted several days prior to the class in order for the students to be prepared for the facilitation. Observations have shown students to be more engaged in class discussion due to a less intimidating environment (students provide a leadership role, not the instructor; enhanced sense of community). The discussion and questioning also has promoted student's critical thinking skills and has helped them to reflect on their own ideas (through the analysis of multiple perspectives). By facilitating class discussion, students have increased their knowledge and understanding of a topic by being empowered to drive their own learning. With proper preparation and in the right context, student-led facilitation can enhance student engagement, develop critical thinking skills, and improve learning.

193

Impact of a Child Safety Seat Checkup Educational Event

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Motor vehicle crashes are the number one cause of death for children. Properly used child safety seats (CSS) reduce the risk of fatal injury to infants by 71% and toddlers by 54%. Seventy-five percent of CSS are installed incorrectly. The high number of varying factors, such as vehicle make/year/model, CSS manufacturer/year made/model, installation methods, locations of air bags, and evolving legislation over the years, creates a complex situation for parents to navigate with little to no training. This unique teaching approach is a collaborative effort between the university and state Extension Service. This Family and Consumer Science initiative taught caregivers exactly what type of CSS is required for their child, allowed them an opportunity to learn and practice installations in a supervised hands-on environment with their vehicle, child, and CSS, while providing them with information on the next stage of seat that is best to protect their child in the safest way possible. Information was provided to promote best safety practices, in addition to minimum legal requirements. Any seat that was broken, recalled, expired, or the wrong fit for the child was replaced through a grant funneled through the state university system that provided brand new CSS at no cost to the caregiver. Upon arrival to the educational event, over 80% of the CSS were installed incorrectly. Upon departure 100% were correctly installed by the caregiver.

195

Relationship between Trainability and Herd Aggression of Horses Utilized in an Undergraduate Equine Behavior Course

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Generational differences have led to a diversity in characterizing student perceptions relating to their previous equine handling experience. The objective of this study was to characterize behaviors between horses to predict

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their trainability with students of varying skill levels. Test horses (n=10) were paired with control horses (n=5) individually in 9.14 m round pens. The interaction between the horses (AggScore) was recorded by three independent observers and scored on a 15 cm line scale rating from submissive (1) to aggressive (15). Horses were also individually worked by one of five trainers of different skill levels. Horses were scored on a 15 cm line scale (TrainScore) rating from obedient (1) to resistant (15) while trainers were simultaneously scored (ConfScore) from timid (1) to confident (15). Correlations were calculated using the PROC CORR procedure in SAS 9.2. Overall, the relationship between TrainScore and ConfScore was weak ($r = -0.10$). However, this was likely due to the individualist nature of horses. Some horses with lower AggScores (<7.7) showed r values ranging from -0.31 to -0.61 , while horses with higher AggScores (>7.4) showed r values ranging from 0.49 to 0.87 . This illustrates that while some more submissive horses will be easier to train with a more confident trainer, more aggressive or dominant horses can be more difficult to train by a trainer with a more confident posture. Therefore when placing horses with students based on handling experience, each horse must still be individually assessed for its personal disposition to predict trainability.

196

Orienting the First Year Student: Mapping the Future

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This project analyzed the benefits of introducing specific career and resource orientation courses into the Environmental Resource Management program at Penn State. First semester student engagement was examined as well as retention rates in the intended college major. Two first year courses that enroll a total of ~100 students combined were studied. Best practices were developed through student interactions, course assignments, and presentations- and used to develop suggestions for student research, career and major option selections. Prospective student visit feedback was weighed in order to enforce the premise that major specific resource and career courses are valued by students from the first visit until the completion of the degree. A literature review of first year student orientation and career courses was compiled to develop the common beneficial aspects and learning outcomes that are present. Observations and suggested adaptations are shared and aimed

academic advisers/course instructors who work with prospective and first year students.

197

Student Knowledge of Animal Agriculture and Animal Welfare Topics: One Year Summary

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With youth today being further removed from the farm and exposed to negative press associated with livestock production and animal welfare, the animal agriculture industry must start educating tomorrow's consumer today. The objective of this study was to assess the knowledge of students on animal agriculture and animal welfare topics. Elementary and secondary students ($n = 640$), ages ranging from eight to 18, from varying school districts in Missouri were surveyed after exposure to educational experiences such as in-class presentations and school petting zoos, to determine if basic education and exposure to positive production practices in the areas of animal agriculture and animal welfare, increased post-test scores. The students were given a 15 question definitive answer pre-test followed by the same post-test approximately one week following the educational experience. Out of 15 questions, students responded with an increase ($P \leq 0.04$) in knowledge to 12 of the 15 questions. Questions pertaining to animal management practices and animal hormone use had the most change ($P < 0.0001$). There were no changes ($P > 0.05$) in student knowledge on questions pertaining to animal welfare compared with animal rights and USDA meat health guidelines. Furthermore, 59% of students answered that they learned about agriculture at school. Therefore, providing educational experiences for students in elementary and secondary schools may increase their knowledge on animal agriculture and animal welfare topics.

200

Developing Pragmatic Research Consumers through Action Based Research Project in Agricultural Education Teaching Internships

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Reflection is vitally important to the teaching process. At the preservice level, this habit of mind is cultivated

2015 NACTA Abstract Poster Presentations

through coursework at the university and through conversations held with cooperating teachers in whose classrooms the preservice teachers are placed. The necessity of critical reflection in teaching situations requires that teachers have the ability to gather relevant data to understand the nuanced differences for practices that work versus those that do not and the reasons for each. Student teachers at The Pennsylvania State University conduct their student teaching internship during the spring semester of their senior year. Developed to enhance reflection and understanding, an Action Research Project was designed and implemented into the internship. In addition to learning how to conduct Action research, major components of the Action Research Project was to provide opportunities for student teachers to identify targeted students, develop a plan to improve student achievement, implement the designed plan, and observe and describe the effects of the plan, documenting the effects on student performance. Additional objectives of the Action Research Project were to 1) Utilize multiple sources. 2) Engage in personal reflections about the plan, its implementation, teacher behaviors, student behaviors, and the effect or lack of effect on student achievement. 3) Share results with AEE instructional faculty/staff and cohort. Following the first year of implementation at The Pennsylvania State University, the Action Research Project has proved to challenge and stretch the teacher candidates. The Action Research Project has promoted deep reflective thought by teacher candidates on classroom environment, student behavior, and teaching strategies.

201

Performance of Incoming Freshman Students with Different Ethnicities and Genders

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Most universities have a diverse population of students with many different ethnicities and cultural backgrounds. The objective of this study was to determine the effects of ethnicity and gender on preparation of students for college level classes through analysis of GPA and standardized entry exams (SAT and ACT). Data were collected on 27,730 students at SHSU over an eight-year period. First semester GPA, SAT scores, and ACT scores were compared across gender and ethnicity using the GLM procedure in SAS. Differences were detected among ethnicities in GPA, SAT, and ACT scores. African American and Hispanic students consistently had lower ($P < 0.05$) GPA, SAT and ACT scores, while Cau-

casian and Asian American students were among the highest for all three scores. International students were among the highest for GPA, but performed poorly on both standardized tests. In regard to gender, females had a higher ($P < 0.01$) GPA, but there were no differences in SAT or ACT scores. These results indicate that standardized entrance exams are not good indicators of first-year student performance, especially for certain ethnic groups, and that females will perform better in college courses even though they may not out-perform males in standardized testing. As instructors, we must be aware of these differences so that we can provide assistance to those students who may need additional help to have success at the college level.

204

Students' Involvement in Campus Organizations: Attitudes and Perceived Benefits

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Engaging students in activities that stimulate critical thinking, problem solving, leadership, civic responsibility, decision making, and build self-esteem and confidence will result in professionals who are well prepared for life challenges. Providing avenues for holistic development of students not only involve classroom activities, but also off-campus. A search of the literature revealed that very little research has been conducted on the impact of campus organizations and holistic students' development. The purpose of this study was to examine the attitudes and perceived benefits of students participating in on-campus organizations. A 39-question survey instrument was designed to elicit from students their attitudes and perceptions regarding the benefits of participating in campus organizations. The instrument consisted of four sections: demographics, academics, extracurricular activities personal and professional benefits. The instrument was pilot tested and subsequent reliability analysis revealed a Cronbach's coefficient alpha of .80. Results indicated that approximately 80% of respondents were female and classified as either sophomore or juniors, and over 70% are involved in leadership. The majority (80%) of respondents indicated that involvement in a campus organization enhanced their academic performance, self-confidence, communication skills, interpersonal skills, and proactivity. Eighty-eight percent indicated their willingness to recommend other students for participation in a campus organization. Generally, respondents also felt very satisfied in being a member of a campus organization. The investigators concluded that involvement in campus organization is a viable avenue

2015 NACTA Abstract Poster Presentations

for students to develop leadership skills, build confidence, and develop both personally and professionally.

206

Didactic and Web-based Animations for Presentation of the Pathogenesis of High Impact Veterinary Diseases

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Educational animations can be powerful tools for presenting complex, sequential processes, such as the progression of events during the development of disease (pathogenesis). We surveyed veterinary pathology instructors and students for their perceived value of animations in didactic instruction. Of 145 veterinary pathology instructors, 37% use animations for teaching. Main benefits included increased learning effectiveness and student interest, and as a diversion from traditional teaching. Of 98 veterinary students exposed to complex animations, 86% felt animations enhanced learning or provided a welcome diversion. However, 73% said that although helpful, the animations did not increase their understanding of the disease. The Emerging and Exotic Disease of Animals (EEDA course) is a web-based course designed to provide information on diseases that can threaten food safety and security. One course component is case-based scenarios that require problem-solving skills to arrive at a correct disease diagnosis. We obtained input from student focus groups and interviews of recent users of the EEDA course about perceptions of the scenarios, and how animations could enhance them. There was widespread support for inclusion of animations, particular as a mechanism to balance text, images and other sources of information. We established best practices for effective animations based on various theories of cognition and learning, and used these to develop specific pathogenesis animations for incorporation into the EEDA course scenarios. The goal of the scenario animations is to increase student awareness, interest, and basic understanding of selected diseases that can have substantial impact on food animal production.

208

Engaged Scholarship: An Environmental Major Encircled in Learning

Robert D. Shannon and Tammy M. Bennett
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This literature review and project analyzed engaged scholarship- its definition, application and benefit to university students in the Environmental Resource Management program at Penn State. Six specific field based courses from the ERM program were analyzed to identify the qualities of an engaged scholarship experience using the criteria derived from the literature. The engaged scholarship courses range included: international embedded courses, service learning, career courses, science based field courses (wetland, stream restoration, limnology). The six major specific courses were then cross examined with non-field based courses to compare the differences in learning outcomes, learner satisfaction and applied knowledge potential. Each course enrolled ~15-30 students from the Environmental Resource Management major primarily. Observations and suggested adaptations are shared and geared towards course instructors who work with and teach students.

209

Impact of a Faculty Learning Community on the Development of Distance Education Courses in a College of Agriculture

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Increasing the number of students graduating with degrees in agricultural sciences in a affordable manner continues to be a priority of land-grant universities. One method for increasing student enrollment is to reach students where they are geographically using distance education (DE) technology. The University of Georgia College of Agricultural and Environmental Sciences is addressing the need by increasing the number of courses taught through DE technology. However, not all faculty are confident in their ability to teach a DE delivered

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course. The College of Agricultural and Environmental Sciences identified a need for the formation of a Faculty Learning Community (FLC) to provide a supportive environment for faculty involved in developing and implementing DE courses. This provided the opportunity for DE-experienced faculty to teach less-experienced faculty the skills to develop DE courses. This presentation will: (1) describe the development of the DE FLC and the implementation of its activities and (2) discuss the qualitative and quantitative evaluation data collected during the FLC. Some of the FLC activities included two, one-day workshops focusing on instructional design and DE tools, and a series of one-hour on-line sessions on DE topics requested by faculty. Overall, participants agreed the FLC was beneficial, but not all participants completed the DE course they agreed to develop when enrolling in the FLC. Future goals are to interview FLC participants to evaluate barriers to implementing a DE course.

210

Teaching Beliefs and Teaching Self-Efficacy of Graduate Students Participating in a Teaching Workshop

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The use of graduate student TAs as instructors is a growing trend; however, many are not prepared to teach. This lack of preparation can cause low teaching self-efficacy and possible reliance on teacher-centered instructional methods. The purpose of this study was to determine the effectiveness of a graduate student teaching workshop on TAs' teaching self-efficacy and examine relationships among experience, self-efficacy and teaching beliefs. The population for this census was graduate students ($N = 15$) who attended a teaching workshop in the college of agriculture at Sul Ross State University in January 2015. A post-then-pre data collection procedure was utilized. Self-efficacy for student engagement and instructional strategies was measured on a 9 point Likert-type scale, while the teaching beliefs constructs of inclusion and sensitivity were measured on a continuous scale ranging from 0 to 11. High inclusion scores indicate greater learner-focused teaching beliefs and high sensitivity scores suggest more focus on the teaching process rather than content. Results revealed TAs'

mean self-efficacy for student engagement increased from 5.39 to 7.15, while mean self-efficacy for instructional strategies increased from 5.22 to 7.35. Correlations revealed that prior teaching experience was related with lower self-efficacy and higher inclusion, while prior instructional training was associated with higher self-efficacy, inclusion and sensitivity. The majority of participants in this study had teaching experience, but no instructional training. This could explain why experience was negatively related to self-efficacy. Successful experiences build self-efficacy and training can foster success, therefore, instructional training for TAs is essential before placing them in the classroom.

217

Student and Faculty Perceptions of Implementing Active Learning in College of Agriculture Courses

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Recent publications indicate that active learning increases student learning and, for effective implementation, faculty must enjoy teaching in this format. A program at Montana State University was implemented to increase active learning across disciplines within the College of Agriculture. Faculty were provided support during fall semester to engage in this program with a faculty retreat describing the required involvement, formation of working-groups, and a book on active learning strategies. Faculty were asked to alter lectures to include active learning strategies in the subsequent semester. In the second semester, follow-up support group meetings were scheduled and faculty surveyed the overall process. In addition, students and faculty completed a two-minute survey at the end of the class period periodically throughout the semester to gauge perceived active learning, engagement, enjoyment, and learning for that particular class period. An independent evaluator visited on three of these occasions to observe classroom activities and summarize teacher and student survey results in a Fast-Sheet format to the faculty within a week of the classroom observation. Faculties were satisfied with the approach taken to implement active learning in their classroom. Student perception of active learning varied widely and did not correlate with faculty perception. Whether student or faculty perception, all course periods were indicated to be, on average, over 55% active learning and enjoyment of the class period was high (above 3.75 out of 5) in all cases. Overall, both faculty and stu-

2015 NACTA Abstract Poster Presentations

dents felt increasingly engaged in the material as their perception of level of active learning increased.

218

Creative and Innovative Professional Development: An Interdisciplinary Collaboration between Teachers and Nutrition Educators

Caroline Glagola Dunn, Natalie M.K. Ridgewell and
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Extension educators regularly provide nutrition programming in K-12 schools. Opportunities are expanding for Extension educators to reach more students by partnering with and training classroom teachers in the delivery of nutrition education curriculum. The purpose of this interdisciplinary project was to develop a rubric for Extension educators to use in the development and evaluation of nutrition education Professional Development (PD) workshops for teachers. Rubric development was the collaborative effort of K-12 teachers and nutrition educators/dietitians. Components were chosen based on leading empirically based teacher PD research. The rubric was designed for Extension educators, who may not have a strong background in classroom education or PD, to use in the enhancement of program planning as both a formative and summative tool. In addition to defining essential PD features, grading for performance is heavily descriptive so that Extension educators are aware of expectations for high-quality PD. Extension educators are encouraged to understand the context of schools, learners, and programs to develop and deliver PD that is relevant, impactful, and engaging. The rubric is also designed to encourage self- and peer-evaluation. An education expert conducted systematic evaluation during and after development, assuring appropriateness of components and grading criteria. Extension professionals have utilized the tool in planning and delivery of highly rated classroom teacher PD. Effective teacher PD can improve implementation of educational programs in K-12 classrooms. The use of a rubric containing well-defined components of PD and detailed explanations of content and resources can aid planning and delivery of effective K-12 teacher PD.

223

Providing Immediate Feedback for Learners by Utilizing GradeCam

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Assessment is a vital component of the educational process and providing feedback in assessment phases allows students to gauge their performance and offers suggestions for improvement. When presented with a multiple-choice type of assessment, students prefer immediate feedback. Several methods exist to provide immediate feedback to students on assessments and web 2.0 technologies can be an effective tool for providing immediate feedback. GradeCam, a web-based grading application, can be utilized via a smartphone/ tablet application or on a computer with a document or web camera, and allows instructors to quickly and accurately grade multiple-choice assessments. Furthermore, it provides an item-by-item analysis of correct and incorrect answers, various graphical representations of responses, and a student grade report. Table 1 outlines the steps to creating a GradeCam account to begin providing immediate feedback on multiple-choice assessments. The free version of GradeCam has been utilized in for AgEdS 450, Farm Management and Operation (Ag 450) at Iowa State University (ISU) for two semesters. GradeCam has eliminated delayed feedback on assessments and student grades are distributed by the end of the lecture period. After the GradeCam program has scanned forms, the teaching assistant immediately inputs grades into Blackboard Learn. Students have expressed satisfaction with the technology and appreciate the timely feedback. Students have stated that it allows them to keep track of their standing in the course. The instructor for Ag 450 at ISU plans to upgrade to the paid GradeCam account next semester. When this upgrade occurs, the efficiency of uploading grades directly into course management systems will be conducted.

226

Perceptions of Undergraduate Students Regarding Global Hunger

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Information is limited in terms of undergraduate perception of issues affecting hunger on a global scale. Perceptions of undergraduate students were determined by

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surveying approximately 4,000 students from 2004-2014 (20 semesters) in the courses entitled "World Population and Food Prospects". Students in this course (Science, Technology and Society 323) represent all colleges on the North Carolina State University campus. Within the first three weeks of the course, students were asked to "List five priorities you think need to be considered in order for hunger to be adequately addressed on a global scale and give reasons for listing each priority." Although some variation was noted between semesters, the top 5 answers, listed in order of importance, included: 1) improve farmer education, 2) increase awareness of the problem, 3) address distribution and transportation, 4) government and politics, and 5) water and population dynamics (listed the same number of times). These results will be used to improve instruction of the course.

229

Adding an Economics Component to a Precision Agronomic Management Course: Challenges and Benefits

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Precision agronomic management integrates traditional soil and crop monitoring with modern technologies that enable precise location and multi-faceted description of the observations. The most common technologies employ global positioning system (GPS) and geographic information system (GIS) principles to generate interpretative maps. While the technological aspect of agronomic management has progressed rapidly, subsequent application of the data output using basic management principles has often lagged. The lag is especially acute with regard to economic principles. Precision agronomic management has recently been offered as a special topics course at a small state university program of agriculture. The course has been taught with units in basic GIS/GPS principles, site-specific concepts in identifying management/monitoring zones for remote sensing, and data collection using field sampling, yield monitors, and variable rate technologies. Students conducted on-farm research and individual research projects to apply the technologies that they had learned. The original agronomy instructor is now seeking to add an economics component by teaming with agricultural economics faculty. Expanding the course material has been found challenging as each instructor must gain a functional knowledge of the other's discipline. True integration of an economics unit requires expanded data collection, a solid understanding of economic principles by the students, and careful consideration of the economic objec-

tives associated with the agronomic management practices. Successful integration of economics should provide students with expanded skill levels and greater employment possibilities. Understanding the economic results of their agronomic management decisions takes students beyond simply making production decisions to higher level profitability decisions.

232

Labeled School Gardens Make Great Classrooms

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School gardens with labeled plants and items encourage reading and agricultural literacy in elementary-age students. While setting up a school garden can be fun, active learning engages students as well as offers hands-on, experiential learning. These gardens help raise environmental awareness with the entire school community becoming a part of students' literacy development. Since all students do not learn at the same pace nor possess the same literacy skills, creating school gardens facilitates learning, supports students' engagement in science, mathematics, agricultural and environmental education, and in language arts and social studies. One such project was implemented at the Sligoville All-Age School in the rural hills of St. Catherine, Jamaica. The project's objectives were to increase agricultural literacy and encourage student participation in sound environmental practices. The design and making of signs and labels for students' garden plots became a part of the students' garden work. During this process, learning was revised and literacy exercised. The labeling process included up-cycling and recycling activities, and garden labeling led to special art/class projects. Additionally, greening the school's compound became an interesting, engaging and excellent way of encouraging interdisciplinary learning. "Green" habits were developed as students learned basic principles of garbage disposal and pest management. Roles such as the promotion of good diet, environmental awareness and development of livelihood skills gained prominence through the project. Following the project's conclusion, student literacy was significantly increased and the school recognized as one of the most environmentally aware schools on the island.

233

Inspiring the Next Generation of Agronomists through New Biofuel Educational Resources

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There has not been a better moment for agronomists to make a positive impact on society than the present time. With the population facing pressing issues such as the necessity to sustainably increase our food and fiber production and generate alternative renewable fuel sources, the demand for future agronomists is on the rise. However, with the shift to a more urban and suburban population, fewer and fewer students grow up on farms. In this scenario, where would the next generation of agronomists come from? Contributions from current graduate students in colleges of agriculture can be invaluable in communicating and inspiring science in youth. However, historically they have not been trained for this purpose. At the same time, school educators and youth rarely, if ever, maintain any kind of scholarly relationship with these graduate students. The gap between these two groups is noticeable and the Graduate Extension Scholars program in the College of Agriculture and Life Sciences at Virginia Tech aims to bridge this gap. Through this program, new educational resources were collaboratively developed by an agronomy graduate student, a 4-H Agent, and a secondary agriculture teacher to introduce elementary and secondary students to emerging research in agronomy. Through a mixture of lectures, hands-on activities, and field-based research applications, students learn about the potential of using annual crops for biofuels and related potential environmental impacts. This project has the potential to inspire the next generation of agronomists.

234

Innovative Approach to Promote Higher Level Learning of Complex Scientific Concepts in a Rigorous Nutritional Biochemistry Course

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Student-centered teaching approaches are well-recognized for promoting student engagement, enhancing knowledge, and developing critical thinking skills. Innovative approaches to teaching complex scientific principles have been studied to enhance student learning and higher-level thinking. To promote learning among human nutrition/dietetics undergraduates in a

high-enrollment nutritional biochemistry course, a one-credit complementary biochemistry recitation section was offered Fall 2014 semester. Of the 174 students enrolled in biochemistry lecture, 51% were in recitation. For each recitation, students were assigned a day to post a question to the course Wiki. The posted Wiki questions were available to students and used to initiate discussion in each recitation. Students could also orally ask questions during recitation, or anonymously post to the Wiki. Results demonstrated 72% of students rated recitation as helpful/very helpful ($p < 0.0001$) and 65% would recommend it to a friend ($p < 0.0001$). The recitation students finished with significantly higher course grade averages, 83% versus 79% ($p < 0.004$). None of the recitation students failed the course. Additionally, recitation students had better study habits and attendance. Of students that studied on a daily basis, 93% were enrolled in recitation versus 7% not enrolled ($p < 0.05$). Sixty-five percent of recitation students were present each time random attendance was recorded in lecture versus 35% ($p < 0.03$). Among students present only 2-3 times per 7 attendance checks, only 14% of recitation students missed class that frequently versus 86% non-recitation. This project supports the value of innovative approaches to teaching challenging and rigorous science-based courses to promote knowledge of course material among undergraduate students.

235

An Evaluation of Student Perceptions and Knowledge Regarding Cooperative Extension in the College of Agricultural and Life Sciences (CALs)

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Despite the strong presence of Extension at land-grant universities, limited research has evaluated student interest, involvement and awareness of Extension, and its potential impact on career choices of students at these institutions. Our aim was to assess student knowledge and perceptions regarding University of Florida (UF)/IFAS Extension. All undergraduates enrolled ($n = 3,737$) in the College of Agricultural and Life Sciences (CALs) during the spring semester were emailed and asked to complete a 23-item questionnaire administered through Qualtrics. Respondents ($n=307$, 8%)(237F, 67M) agreed or strongly agreed that it is important to disseminate the results of UF research to the general public (84%), would like to gain experience volunteering with a faculty member involved in the development and

2015 NACTA Abstract Poster Presentations

dissemination of community educational programs (67%), and reported that they had heard of Extension (66%). Students who had heard of Extension were most familiar with 4-H youth development, knew the purpose and/or role of Extension (80%), and had considered a career in Extension (50%). All respondents were then provided with information describing the purpose/mission of Extension and then asked about their career interest and perceptions. Respondents agreed or strongly agreed that it is important to know the role of Extension (84%), would like to gain experience volunteering with Extension (65%), were interested in learning more about career opportunities with Extension (60%), and would consider a career with Extension (55%). Results suggest that CALS students demonstrate an interest in pursuing Extension-related experiences and careers. Further research is needed to evaluate Extension opportunities available throughout CALS.

236

The Effectiveness of Program Area Committees Related to Extension Program Planning

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Volunteers play a critical role to Extension, assisting with program planning, providing input and guidance in local Extension educational programs, and providing assistance with program implementation/evaluation. Extension volunteers have been utilized in Extension for over 50 years, serving on program area committees to develop programs that meet the needs of local clientele. Agriculture/Natural Resource Program Area Committee (Ag/NR PAC's) members were selected to participate in a survey that consisted of Likert type statements focusing on the purpose, responsibilities, qualifications, time obligations, County Extension Agent interaction, assisting with educational event implementation and evaluation. The findings of this study revealed that Ag/NR PAC members have an overall understanding of the purpose, responsibilities, and qualifications of PAC's. However, 42% of respondents disagreed or remained neutral to subject matter specialists being utilized in committee meetings. Data also showed that members consider personnel education as a motivational factor for serving on the Ag/NR committees. Committee members feel

strongly about assisting with program planning and attending the educational programs, but are not remaining actively involved in the evaluation or interpretation phase of the programs. The findings of this study resulted in seven associated recommendations related to working with Ag/NR PAC's for the agency. The results found that Ag/NR PAC's are still a crucial part of Extension and serve an important role in identifying issues at the local level. Information found within this study contributed to educating County Extension Agents on volunteer management, onboarding of new Extension agents and development of curriculum for Extension coursework.

237

Increasing Student Engagement on a University Teaching Farm through an Experience-rich Management Course

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Universities face the challenge of using teaching farms to create modern and relevant learning experiences; all while budgets, scheduling, and online courses put pressure on animal science instructors to reduce the use of laboratory sections. As part of a university-wide Quality Enhancement Plan focused on generating experience-rich activities, the School of Agriculture at Murray State University handed management of one of their teaching farms over to students in a newly created course. This quantitative study examined the single-semester usage of this student-managed farm compared to usage of the same farm prior to course conception. The guiding objectives were (1) determine the direct contact hours of students within the management course, (2) determine the indirect contact hours of students within the course, (3) determine the total hours (both direct and indirect) of students outside the management course; and (4) compare student-hours of farm usage generated by the course to estimates of farm usage prior to the course. Findings included 810 direct contact student-hours and 422 indirect hours for students within the course (excluding student worker hours); and 772 direct and indirect contact hours for students outside the course. In total, students in six courses from three departments experienced direct or indirect contact with the farm as compared to two courses from one department in the prior year. This study showed a year-over-year increase of student farm usage hours of more than 600%. The results indicate that courses like this have the potential to reinvigorate meaningful student interaction with university teaching farms.

2015 NACTA Abstract Poster Presentations

239

Summer Interns as Recipients and Deliverers of Agriculture Related Information

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Three students in the Department of Agriculture at Virginia State University were hired by the Department for a paid ten-week summer internship program in 2014. Two students were juniors in the Agriculture Business and Economics concentration, and one was a senior in Pre-Veterinary Medicine. Students were engaged in many activities during the ten weeks. These included work with the VSU Small Farm Outreach Program, the academic department's Summer Enrichment Program (SEP) for high school students, data analysis related to a survey on the demographics of Virginia farmers, exposure to program areas of Virginia Cooperative Extension (including agriculture and natural resources, and family and consumer sciences), and a trip to Virginia Tech for hands-on learning about Tech's soybean research program. The students served as mentors and team leaders during the two weeks of the SEP, a recruiting program for area high school students. One of the interns had participated in the SEP himself before enrolling at VSU. During the fall semester, the students were enrolled in the internship course, in which they earned three credit hours and reported their experiences and future recommendations to their fellow students and faculty. Upon completion of the internship, students not only had a better comprehension of various aspects of teaching, research and outreach outside their areas of concentration, but also had a more robust understanding of how these programs are conducted effectively and information is delivered to end users. This program could be used as a model for other academic programs with available funding.

240

Utilizing Social Media and Technology in the Classroom: Innovative or Irritating?

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Virginia Tech

The growth of social media and handheld technology has reshaped communication and resource sharing in modern culture; a change also reflected in the higher education setting. As educators it is our task to incorporate these tools in contextually relevant ways and model professional use of social media and technology for our

students. The goals of this presentation are to: examine technological applications and social media functions within the context of higher education and provide participants with examples relevant to their own courses. Research suggests that social media is a preferred form of communication amongst today's students and can increase student engagement, promote conversation both inside and outside of the formal classroom setting, and support academic outcomes. Unfortunately educators are often slow to incorporate these tools in to their courses. However, with so many distractions, it is important to consider if utilizing social media and technology in courses is innovative or irritating. Techniques and information regarding the benefits of social media and technology in the higher education setting will be presented and examples of how these tools can be used in academically appropriate ways will be provided. It is important to review popular forms of social media relevant to today's classroom and determine the best options for utilizing these technologies so that they enhance the learning experience. There is a time and a place for engaging students with both social media and technology and it is possible to utilize these tools without it being a distraction to the overall classroom setting.

247

Mentoring About Climate Change: A Two-Way Street

Brooke Zanetell*

University of New Mexico, Taos

Climate Change is a USDA National Priority Area. The University of New Mexico at Taos and New Mexico Highlands University received USDA funding to create the Northern New Mexico Climate Change Corps (NNM-CCC). The program purpose is to 1) increase skilled graduates with a deep understanding of climate change and 2) increase minority representation in Natural Resources Management (NRM) agencies which are on the front lines of the climate change challenge. In combination, the two purposes provide an opportunity for two-way mentoring: NRM professionals supervise student interns and teach the skills needed for career success, while students share climate change knowledge with their NRM supervisors. The success of two-way mentoring hinges on shared expectations, mutual respect, and a willingness to learn on the part of both seasoned supervisors and the students. A key component is the investment of time and resources prior to the internship to ensure that both the student and the mentor have aligned expectations and are committed to sharing knowledge and learning from one another. Preliminary

2015 NACTA Abstract Poster Presentations

results of two-way mentoring suggest 1) increased awareness by students and supervisors of climate change impacts, 2) increased dialogue and communication among NRM personnel about climate change, and 3) evolving perceptions of the traditional role of supervisors and students involved in an internship.

248

The Odyssey of Creating a New Study Abroad Program

Colleen Kelly
North Carolina State University

What can faculty study abroad program leaders expect to encounter during the journey from the initial idea to departure? For faculty contemplating creating their own study abroad experience, this case study example from North Carolina State University (NCSU) may provide a valuable overview of the steps involved and insight into what to do and not to do. The odyssey, a multi-year attempt to create a study abroad program to New Delhi, India, disembarked from the university's strategic plan, wove through relationships within the university, and brought aboard a strategic international partner. Planners navigated difficult processes such as budget creation, curriculum development and approval, and program marketing. Program leaders weathered uncontrollable external factors, such as international events and fiscal constraints, during the creation and recruitment process. Unfortunately, the program did not succeed in recruiting enough students; however, many lessons can be learned, including the importance of relationships, institutional support, and matching students' interests and means.

250

Bridges of Madison County: Motivations and Barriers of Appalachian Students to Pursue Higher Education

Joy E. Morgan*, Travis D. Park and Meghan M. Wood
North Carolina State University

It is no surprise that less than twelve students are currently enrolled in North Carolina State University from one of the poorest Appalachian region counties in North Carolina. With a population of 21,022 and 17.3% of people living in poverty, these students who ventured to Raleigh to attend college discussed their collegiate experiences for a qualitative research project. These students

described their county with one high school being rural and lacking diversity. The main objective of this research study which involved a focus group and then individual interviews sought to determine the motivations and barriers for college attendance by seven Appalachian youth all majoring in an agriculture field. They continually stressed the impact of key individuals such as teachers, FFA advisors, and college tours as encouragement for "leaving the county to do something better with my life" and growing up. When addressing the barriers for college attendance, financial issues were the top concern. Without scholarships (which each of these students received), attending college would not have been an option. Several students mentioned the lack of counselor guidance and lack of advanced placement classes which are needed to boast GPA's and SAT scores to a competitive level as a major barrier. Recommendations for the recruitment of students from the Appalachian region include working with FFA advisors and teachers to foster relationships with students early in their high school career. High school students in rural areas need the same quality education components before improvements in livelihoods can be made.

251

A Comparison of Knowledge Gained through Multidisciplinary Teaching on Food Security

Lori Unruh Snyder and Anthea Saez
North Carolina State University

The primary goal of interdisciplinary perspectives and global knowledge education within the Crop Science Department at North Carolina State University is to provide students with a diverse knowledge of global issues. The course titled, Feast or Famine, IPGK 295, is a global perspectives course that focuses in food security around the world. The overall goal of this course is to enhance learning through a multidisciplinary perspective and to increase diversity of thought within the Crop Science curriculum. The purpose of the research was to compare learning outcomes across three different teaching styles. The course Feast or Famine was taught in the summer of 2013 as a freshman introductory course in a traditional class setting. In the summer of 2014, the course was offered as a hybrid class and as a completely online course. All three classes had hands on learning experiences throughout the course where students were exposed to food security issues and were challenged to think about the social and agricultural sides of these issues. Pre-evaluations and post-evaluations were given to assess both knowledge gained and changes in student perspectives. This research was conducted as a

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double-blind study. Pre-test and post-test comparisons were made based on themes including food security, social dynamics in agriculture, and availability of natural resources. Students perspectives on the topics covered during the course were also measured based on keywords students used in their free response answers. The results were analyzed as qualitative measures.

254

Analysis of Student Engagement by Academic Major

Wayne Atchley*, Whit Weems, David Frazier and Mike Haynes
Tarleton State University, Stephenville, TX

The National Survey of Student Engagement (NSSE) is administered by the Center for Postsecondary Research at the Indiana University School of Education. NSSE results are used by institutions across the nation to inform decisions about different aspects of the undergraduate experience both inside and outside of the classroom. Higher levels of student engagement correlate strongly with student retention and common indicators of student success. Tarleton State University has facilitated the NSSE data collection every two years since 2007, and data are available to faculty and staff for analysis and reporting. Combining the NSSE dataset with data from the University's student information system, it is possible to disaggregate engagement results by various student demographic variables. One important demographic variable to consider is Academic Major. A widely accepted approach to increasing student engagement is the inclusion of high impact educational practices such as experiential learning within the classroom. Many of the academic programs in the broad field of Agricultural Education are grounded in the principles of experiential learning. A strong correlation between student engagement and academic majors within the field of Agricultural Education could lead to increased program funding and would allow data driven decisions during the academic budget cycle.

255

A Systems Approach to Fostering a Collaborative Experience for Teaching Research: A Case Study

Billy R. McKim and Ashley M. Yopp
Texas A&M University

Annie R. Specht
The Ohio State University

Faculty at tier-one research institutions teach undergraduate and graduate courses, conduct research, and secure outside funding to support their research endeavors. This academic balancing act forces faculty to find innovative solutions to accomplish these tasks simultaneously. One possible method is a cyclical, self-sustaining system of undergraduate and graduate students, experience-based coursework that prepares students to conduct high-quality research, and industry partners willing to provide real-world problems and funding. The Digital Media Research and Development Laboratory (DMRDL) at Texas A&M University was designed as an experiential learning opportunity for graduate and undergraduate students to conduct social-scientific research for industry partners. Since 2012, faculty have taught parallel undergraduate and graduate research courses, helped students define research problems, and led data collection at sites designated by industry partners. DMRDL students have conducted research in more than seven states, which has included surveying more than 15,000 individuals and conducting in-depth interviews of hundreds of individuals. DMRDL outputs include a steady line of inquiry and more than \$100,000 funding to support faculty leaders' research endeavors; a stable source of qualified graduate students with research and mentorship experience, including more than 50 students per year actively participating in faculty-led research projects; more than 16 undergraduate theses completed since 2012; improved undergraduate retention and graduation rates, and increased student engagement.

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256

Analyzing Agricultural Leadership Programs across the United States: Trends in Majors, Minors, Options, Graduate Programs, Certifications and Courses

Jackson Alexander*, K. Jill Rucker and Donna Graham
University of Arkansas

Identifying the make-up and practices shaping agricultural leadership programs is imperative in understanding how to lead these programs into the future. Agricultural leadership programs hold roots at land-grant universities within agricultural education departments, and have shifted from focusing on the education of rural youth to educating students on becoming empowered community members. These programs continue to enjoy success across the country, but there is a clear lack of research regarding the number of programs, types of programs, and courses offered. Research related to agricultural leadership academic programming has been severely disjointed and inconsistent. This study investigated the existing agricultural leadership programs at land-grant institutions across the United States in order to understand commonalities among program offerings and curriculum taught. An analysis of land-grant institutions revealed 21 schools offer some type of agricultural leadership program. Of those 22 institutions, eight schools offer an agricultural leadership major, 11 offer an agricultural leadership minor, seven schools offer masters or doctoral agricultural leadership graduate programs, 11 offer a concentration, specialization, or option in agricultural leadership, and two institutions offer an agricultural leadership certificate. Furthermore, these institutions are consistently teaching courses focused on organizational and personal leadership development, closely followed by leadership development in small groups and teams, and lastly, rural and community leadership development. Currently, 11 institutions require completion of a leadership development internship before graduation. Post-secondary institutions are working to fulfill leadership development needs of students within departments of agricultural education and schools of agriculture.

258

Protecting Water Quality – Spreading the Message

J.A. Gleichsner*, J.B. McGonegal, B.J. Stoss, A.J. Rudd and J.J. Cahoj
Fort Hays State University, Hays, KS

In 2013 at the Governor's Conference on the Future of Water in Kansas, Governor Sam Brownback issued a call to action to address the need for a Vision for the Future of Water in Kansas that meets the state's needs now and in the future. "Water and the Kansas economy are directly linked," Brownback said. "Water is a finite resource and without further planning and action we will no longer be able to meet our state's current needs, let alone growth." Studies show that the Ogallala Aquifer is declining faster than it is recharging. Reservoirs which are critical water storage structures are filling with sediment (the major pollutant in Kansas). If Kansas takes no action in the next 50 years: 1) the Ogallala will be 70% depleted and 2) the water supply in federal reservoirs will be 40% filled with sediment. Although the main focus of the Vision Plan is water supply, quality is also of concern as water sources become depleted. This project allowed students to learn and share ways to protect and improve water quality with the public. Activities included: 1) an environmental tour of Ellis County showing Best Management Practices (BMPs) to protect water quality, 2) rain barrel construction for the community, 3) geo-caching with elementary school children focusing on water quality at a reservoir, and 4) using an EnviroScape to demonstrate how pollutants (point and nonpoint) from residential, industrial, transportation, construction, forestry, recreational and agricultural sources contaminate groundwater and surface waters and ways to prevent it.

259

Using the new *Illustrated Guide to Soil Taxonomy* in Undergraduate Soil Courses

Kim J. Kerschen*, Michel D. Ransom and
Stephen J. Thien
Kansas State University

Soil Taxonomy is the official soil classification system used in the United States. The system is quite complex and can be complicated for beginning soil science students to understand and use. Consequently, a National Cooperative Soil Survey advisory working group developed a simplified version called the *Illustrated Guide to Soil Taxonomy*. This guide is designed to help college students learn the fundamental concepts of pedogenic features and soil classification. This study evaluated the effectiveness of the illustrated guide when used by students in soil science courses as compared to traditional methods with detailed keys. Classes at Kansas State University included were AGRON 305 (Soils) and AGRON 515 (Soil Genesis and Classification). Student learning was evaluated using pre and post-test scores, assignments, and evaluation surveys. Results from test

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scores and assignments indicated that prior exposure to soil classification plays a role in student understanding of soil taxonomy. In AGRON 305, no clear student preference was indicated between the traditional textbook and the new illustrated guide users. However, in AGRON 515 students overwhelmingly preferred the new illustrated guide over the traditional *Keys to Soil Taxonomy*. Scores on the assignment were higher for the illustrated guide (8) as compared to the *Keys* (6.4) ($p=0.01$). On the evaluation survey, 90% of the students said they preferred using the illustrated guide over *Keys to Soil Taxonomy*. Study results indicated the *Illustrated Guide to Soil Taxonomy* is a useful teaching tool best suited for upper-level courses where students have more soil science background.

262

100,000 Strong in the Americas- Private – Public Partnerships Engagement for Study Abroad in Costa Rica

Lori Unruh Snyder and Amber Willis
North Carolina State University

The goal with 100,000 Strong in the Americas is to reach 100,000 US students studying, training or research abroad in the countries of the Western Hemisphere by 2020. This is a program supported by Partners of Americas in Washington DC under President Obama. In March 2015, there was a spring break study abroad program that was a seven-day experience to Costa Rica to learn about sustainable agricultural practices along with the cultural lifestyles. This program was linked to Private-Public partnerships in the tropics. It was very valuable to the student's academic career because it gave them a chance to experience new perspectives on food sustainability. Since food security is becoming more abundantly discussed in the global community, this experience allowed the students to be exposed to different topics of food security relative to Costa Rica. The students were given an opportunity to partake in "Experiential Learning" through several visits to local schools by participating in hands on activities that have been developed prior to the trip. The students were engaged in depth conversations about the importance of private-public partnerships but also were engaged with the awareness of how partnerships shift. This grant was directly impacted by the buyout of the Brazilians to own the now private company, Chiquita Brands International. The shift of from public to private directly impacted students learning of how workforce development can be impacted both locally and globally. The experience with

100,000 Strong in the Americas will be discussed along with students' experiences with this grant.

265

Novel Approaches to Teach Histology to Undergraduates in the Reproductive Sciences

Kyle C. Caires
Berry College, Mount Berry, GA

Histological analysis and interpretation of tissue samples requires mastery of morphological characteristics along with the reliance on staining techniques. Given the complex cellular biology of reproductive tissues such as the testis, it is clear that even with routinely used hematoxylin and eosin staining, the existence of diverse populations of germ and somatic cells presents a significant hurdle for undergraduate students to gain proficiency in the reproductive sciences. We have recently implemented the use of immunohistochemistry (IHC), in which students carry out an *IHC experiment*, and *must integrate* anatomical, immunological and biochemical techniques to selectively identify and label distinct cell types in complex tissue sections by exploiting antibody-antigen interactions. The results of immuno-histochemical analysis help highlight the morphological and discrete characteristics of specific cell types while also providing more contrast than typical H&E staining. Together these avenues help students gain a better understanding and retention of tissue architecture in a variety of organs. Moreover, the use of binary transformations and gray scale models generated using IMAGEJ software has provided a valuable means to help students compare, contrast and describe differences between cell populations in a variety of tissues. We feel these approaches will help improve microanatomy instruction in classroom settings for agricultural and biomedical curricula.

266

Undergraduate Research Best Practice: Understanding Success through Contextualization

Jonathan M. Seymour
University of Georgia

The University of Georgia College of Agricultural and Environmental Sciences (CAES) Undergraduate Research Initiative (URI) encourages CAES students to conduct research over a full-academic-year and present their work at a culminating research symposium. Scientific inquiry pertaining to Undergraduate Research (UR) at other institutions of higher education has been aimed

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at quantifying the benefits that faculty-guided research is believed to provide the undergraduate student. The URI was designed around promoting the competencies outlined in the literature review of the preceding studies and promoting scientific research within the college. This presentation will outline how qualitative research was used to contextualize the UR experiences of participating URI faculty and students for the enhancement of the URI. Five students and five faculty members contributed to the study through interviews ranging from 30-110 minutes. Participants came from various departments within the CAES. The leading research question for the study was: What factors influence UR faculty and student participants to evaluate their URI experience as successful? Through thematic analysis, patterns emerged from the interviews and the resulting codes represent the culminating interpretations of the study. Research team structure, mentors' leadership style, and research activity structure were attributed to faculty and students' interpretations of successful or unsuccessful UR. Motivations, competency, and preparedness were qualities associated with successful or unsuccessful UR partnerships. The presenter will argue that this data can be used to inform best practices for the URI and increase the likelihood of participants' reciprocated success.

268

“Santorio Santorio, We Hardly Knew You:” Strategies for Improving Carbon Cycle Literacy

Tony Hartshorn*, Jamie Cornish, Nick Lux and Irene Grimberg
Montana State University

The vast majority of college students have a very poor understanding of the carbon cycle; in a national 2009 survey, between 75 (post; n=138) and 83 (pre; n=314) percent of undergraduates believed carbon mass could be converted to energy during photosynthesis. We have found comparable results at Montana State using the same question though with much greater variance. We also asked: “When the leaves in a compost pile decay, they lose mass. Where does that mass go?” This question parallels a late 2014 research effort: “When somebody loses weight, where does the fat go?” Finally, our most recent informal science education efforts have found G2-7 students shared the misconception that mass can be converted to energy. A potential source for these misconceptions is Albert Einstein's $E=mc^2$. How can these misconceptions—that mass and energy need not be conserved—be remedied? Here we report on results from two strategies. First, we recount Santorio San-

torio's discovery—in the early 1700s – that for every ten pounds of food and drink eaten, he measured, he could only record four pounds of feces and urine out. Santorio Santorio attributed the difference to perspiration insensibilis (“insensible perspiration”). Second, we have shown students real- or near-real-time measurements of the carbon dioxide either exhaled by students or that accumulates in rooms occupied by students. While both strategies together were most effective in improving student learning outcomes, we caution that Einstein's legacy appears deep-seated, so repeated corrections of these misconceptions appear warranted.

270

The Effect of Supplemental Instruction on Student Performance and Metacognitive Skill Development in a First Year Chemistry Course Sequence

Greg Pillar*, Jennifer Daniels, Beth Stuart, Andy Tucker, Frantisek Majs and Shariva White
Queens University, Charlotte, NC

Supplemental Instruction (SI) is a peer learning program used in higher education institutions to reduce student attrition, improve student learning in foundation/introductory courses and prepare students for the transition to upper-level course work. Through regularly-scheduled and informal review sessions with an SI instructor students compare and review notes, discuss readings and review homework or additional problem sets. Additionally, and perhaps most importantly, SI sessions develop critical thinking, note taking, problem solving and organizational/time management skills critical to success in the course and college in general. In response to the high attrition rate between semesters (31.7% over 10 years) in a two semester general chemistry course sequence a SI program was developed to improve student learning and success. In the first semester attendance frequency at SI sessions (26 out of 74, 35%) was positively correlated ($p = 0.05$) with the end of course grade with all students who attended SI sessions earning a passing grade in the course. Initial feedback from students who attended SI sessions was overwhelmingly positive with many noting improvement in learning course content and development of metacognitive skills. Additionally, feedback from SI instructors has led to changes and improvements to the curriculum and delivery of course content. Overall, the initial success of SI in these courses has led to further investment in the program by the University and planned expansion into other courses in physics, math and social sciences.

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271

Optimizing Recruitment Strategies for Food Safety Careers Using the Social Cognitive Career Theory

Kristen Saniga and Clint Stevenson
North Carolina State University

Recently, a general shortage of food safety professionals has been observed despite the food industry rapidly expanding. Food Safety professionals attest that training alone is not sufficient to be fully competent and that a formal education is also crucial. The objective of this research is to work towards finding the most effective method to recruit the next generation of food safety professionals and encouraging them to pursue an education in food safety. Using the Social Cognitive Career Theory, we constructed a recruitment website and four videos. Using a 5-point Likert scale and referencing the STEM Semantics Survey, surveys were constructed and administered to participants before and after viewing the recruitment presentation to measure any changes in their views towards food safety.

273

Impact of Major Program Events on Instructor Self Perception

Andrew Bolton* and Don Edgar
University of Arkansas

Determining the characteristics of an effective teacher has been the subject of several studies. Coinciding with these characteristics, instructor's first year experiences may impact their professional satisfaction. Documentation exists which has determined that high numbers of activities an agricultural program partakes in yearly may affect the instructor's perception of impact. However, there is a gap in research on how an instructor evaluates their self and program impact. The objectives of this study were to (1) determine major events in agricultural education programs, and (2) describe how teachers view themselves based on outcomes of these events. Data were collected from agricultural instructors over a two week period in the fall using a convenience sampling method with six schools being sampled. Researchers interviewed teachers in the early portion of their career as well as those who have been in education for many years. A list of varied activities was compiled to provide a schedule of a typical agricultural education program, demonstrating the different ways an individual defines success. Findings revealed many instructors measured

their performance not through a collection of plaques and trophies but by the growth of their students. This finding spanned over all the years of experienced surveyed through this study. These findings would be especially important information for pre-service teachers as well as those in their first years of teaching by providing insight into the field of agricultural education and providing a profile of the input expected from successful agricultural educators.

274

Establishing a Professional Science Master's Program to Develop Future Biotechnology Workforce with Business Skills

Samuel N. Nahashon*, Ahmad Aziz, Korsi Dumenyo and Chandra Reddy
Tennessee State University, Nashville, TN

The long-term goal of this project was to establish a Professional Science Master's (PMS) degree program in biotechnology at Tennessee State University (TSU) to train future biotechnology workforce with skills that integrate biotechnology and business management. This involved assessment of current knowledge and the application of biotechnology and business skills in agriculture, healthcare and other related industries in Tennessee; training of industry personnel in blending biotechnology and business skills to improve production and marketing; and training students, especially minorities, in agricultural biotechnology coupled with business management skills. The project dissemination activities included class offering, laboratory hands-on training, and workshops. A survey was conducted to assess the educational background and required skills of employees of selected biotechnology companies in Tennessee. All the companies surveyed strongly expressed the need for biotechnology training for their workforce. While majority of their employees held certificates or Bachelor's degrees, very few held graduate degrees. Most companies expressed the need to retrain their current workforce in current biotechnological tools. Indeed, the survey revealed a great need for training in biotechnology skills to cater for the personnel needs of the biotechnology industry in Tennessee. Curriculum for the PSM program was developed. Seven graduate students supported by this project have graduated with a Master's degree and two are currently training in the program. These students are a part of future workforce of the agricultural biotechnology industry in Tennessee and the nation.

2015 NACTA Abstract Poster Presentations

275

Determining Essential Components of a College-level Bioenergy Curriculum Using the Delphi Technique

Kimi Grzyb*, Brian Hartman and Katharine G. Field
Oregon State University

In order to develop bioenergy into a viable industry capable of providing valuable amounts of energy and employment, there is an immediate need for a workforce whose education combines interdisciplinary content knowledge with integrated approaches to innovation and problem solving. To meet this need, it is necessary to identify and prioritize the topics that should be included in a college-level bioenergy curriculum. A three-round Delphi study was implemented to establish consensus among a panel of bioenergy experts. Round 1 consisted of a single open-ended question: Keeping in mind the future of a commercial bioenergy industry, what content knowledge should a student have upon completion of a college-level bioenergy curriculum? Responses from round 1 were qualitatively coded into themes. In round 2, experts were asked to rate the importance of including each theme using a 5-point Likert-type scale (1=Non-essential to 5=Essential). Round 3 determined final expert panel consensus and stability and resulted in the following 13 themes, nine of which were rated ≥ 4 out of 5: Energy Basics, Types of Bioenergy, Environmental Impacts (including Life Cycle Analysis), Current Technologies, Societal Issues, Logistics, Policy, Biomass Composition, Non-Bioenergy-Specific Fundamentals, Biomass Production, Conversions, Bioenergy Market, and Business-Related Knowledge. Results will be used to bolster the existing bioenergy education initiative at Oregon State University and provide guidance to other institutions interested in developing similar bioenergy education programs.

cook from their own family gardens. Separately, parents also received instruction in family leadership, and youth received training in effective communication. Families and staff cooked and ate together. Before and after participating in the program, parents and youth filled out questionnaires on family life and on each other's behaviors. Statistically significant differences in parents' post-test responses were: youth showed more initiative at school and home after participating in the program; grades improved; parent-child relations improved; the family spent more time together; the family had more meetings; parents felt more confident leading the family; parents communicated more with each other and their children; and parents trusted children more. Statistically significant differences in youth survey responses after attending the program were: Parents nagged them less; parents showed more respect; the family had more meetings; and children felt more important in the family. Parents and youth reported liking meals at home more and eating healthier food. Guided team-work in valued agricultural activities, along with communication training appeared to improve family life.

280

Strengthening Families through Sustainable Agriculture

Mary Martini, Kanayo Sakai and Taryn Kurosawa
University of Hawaii at Manoa

This project improved parent-youth communication, reduced teen risk behavior, and strengthened families by helping members work together to build, harvest and cook from family gardens. Forty families attended the program 3.5 hours/week for 12 weeks. Staff led families through hands-on activities to plan, build, harvest and



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