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NACTA Journal

the professional journal
advancing the scholarship of
teaching and learning in
agricultural, environmental,
natural and life sciences

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Computer Usage and Perceptions of Incoming Students at a 2-year Agricultural School¹



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Abstract

Many college professors assume incoming students are technologically savvy and have the appropriate computer skills for college. This research was conducted to determine if students perceive themselves to have appropriate computer skills upon entering college. A survey of incoming freshmen at the Ohio State University Agricultural Technical Institute (OSU ATI) was conducted in orientation classes during Autumn Quarter, 2010. Students were asked to rate their perceived level of computer competence in several areas including: email, digital photo editing, Internet research, word processing, spreadsheets and database usage. Most students felt their skills to be intermediate in the areas of email, Internet research and word processing. Skills in digital photo editing and spreadsheets were perceived as between beginner and intermediate, indicating less confidence and/or experience in these areas. Almost all of the students felt that computer skills would be helpful in college and that college would only add to their skills. Additionally, almost 90% of the students brought a computer to campus. Intriguingly, fewer than 8% of students reported that computers would not be helpful in their college careers, nor would they be helpful in their future careers.

Introduction

Technology and computers have become ubiquitous in today's society. The current group of college students and those who will be entering college in the next few years are often termed 'digital natives' (Prensky, 2001). These students have grown up with computers, cell-phones, MP3 players and the Internet. The use of technology in academic settings has also increased in recent years with the advent of Web 2.0, course management software, educational cell-phone applications, and social networking sites

geared toward education. Due to the pervasive nature of technology in today's academic and non-academic settings, the assumption is often that students enter college with not only basic computing skills, but often advanced computing skills.

Incoming students not only navigate all the challenges and new experiences of college, but must learn new technological skills. In today's paperless society, course scheduling, registration, applying for financial aid and similar activities are completed online. Course management software is utilized for posting grades, discussions, assignment submission and testing. Because today's "digital natives" have grown up in, and are connected to, this virtual world the assumption is students are computer savvy. This includes having the knowledge and skills needed to navigate the online world with ease and utilize it effectively to increase their academic skills, knowledge and job readiness.

Employers have long been selecting college students with appropriate computer skills. More than a decade ago, 83% of potential employers reported technology skills as important or very important when making hiring decisions (Monk et al., 1996). As expected, recent studies confirm that employers continue to feel computer skills are important for recent college graduates (Bartholomes, 2004, Gupta, 2006 and Johnson et al., 2006). Since it is assumed that students already possess adequate computer skills, many colleges do not require a basic course in this area. Fewer still test incoming students on their computer skills.

If colleges are assuming the "digital natives" have at least basic computer skills, what do the students feel their perceived level of skill to be? Johnson et al. (1999) found that this assumption that students already have the skills needed in college was prevalent in the

¹This study was deemed exempt by The Ohio State University Institutional Review Board.

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1990's. However, little research has been conducted recently to verify if in fact this assumption made by faculty is also made by the students themselves. The main purpose of this paper is to determine if the assumption that incoming college students are "digital natives" holds true in the students' eyes.

Methods

The research reported in this article took place at OSU ATI which has Associate Degree programs in 29 areas of study, mostly related to agriculture or horticulture. However, there are also programs in business, biotechnology and engineering technologies. Incoming students enrolled in the orientation courses (General Studies 201T: Personal and Career Orientation and Food, Agricultural, and Environmental Sciences 100: Food, Agricultural, and Environmental Sciences Survey) at OSU ATI were surveyed about their computer usage and perceptions during Autumn quarter 2010. The orientation class was selected because it is a required class and is typically taken during the student's first quarter of enrollment.

A 15-question survey was designed with the following research objectives in mind:

1. Report the demographics of the incoming students enrolled in the orientation course and their use of computers prior to attending college.
2. Determine the students' self- perception of their computer skills and if they perceived those skills would be important while in college.
3. Correlate if student background (rural vs. non-rural) contributed in a significant way to student perceptions of their computer ability.
4. Evaluate if the students feel their computer skills would be enhanced while in college and if their skills would be important for future career success.

A portion of the survey instrument is included in Figure 1. Five questions were used to gather demographics while the other ten gained insight into whether the students had computers in their home or school and how they were used. Questions were asked to determine how students felt they would utilize computers while in college and if their computer skills would be enhanced in college. Finally, questions were asked to gauge how important students felt computer skills would be for their future careers. There were opportunities for the students to explain their answers as well.

Surveys were given to nine Orientation instructors to administer in their classes. Two instructors did not return completed surveys. The students were asked to complete the surveys during class time and participation was voluntary. Three hundred twenty-

Figure 1: Selected Questions of the Student Survey Used to Determine Student Self-Perceptions of Computer Skills for Incoming Freshman Enrolled in Orientation Class at The Ohio State University Agricultural Technical Institute, Autumn 2010

Please answer the following questions:

What is your age?
 18-20
 21-29
 30+

What is your gender?
 Male
 Female

Where did you live?
 On a farm
 In the country, but not a farm
 Within a town/city

What is your major:

Did you have a computer in your home?
 Yes
 No

Were there computers in the classroom in your high school?
 Yes
 No

If yes, how did you use the computers? (Check all that apply.)
 In class only presentations
 Class assignments/homework
 Took a computer class
 Personal use (i.e., check email, Facebook, etc.)

How would you rate your overall computer skills?
 No skills
 Beginning skills
 Intermediate skills
 Advanced skills

How would you rate these specific skills in the following areas?

	None	Beginning	Intermediate	Advanced
Internet Research				
Use a Word Processor				
Use a Spreadsheet				
Check and Send Email				
Edit Digital Photos				

Did you bring a computer to ATI?
 Yes
 No

If yes, what kind?
 Desktop
 Laptop

five students were enrolled in the orientation classes and 215 valid responses were collected for a return rate of 66%. Of the 29 technologies offered at OSU ATI, 23 were represented.

Results and Discussion
Demographics and computer availability of the incoming class of students at OSU ATI

Approximately 93% of students were of traditional college age, 18 – 20, 6% were 21 – 29 years old and 1% were over 30. Approximately two-thirds (61%) of

Computer Usage and Perceptions

Table 1. Demographic Statistics for Incoming Freshman Enrolled in Orientation Class at The Ohio State University Agricultural Technical Institute, Autumn 2010

Factor	Label	Number	Percent
Gender	Male	131	61
	Female	84	39
Age	18-20	197	92
	21-29	15	7
	30+	3	1
Background	Rural	157	73
	Non-Rural	58	27

those surveyed were male. Just under three-fourths of the surveyed students came from a rural setting, while 27% reported living within a town or city. See Table 1 for demographic statistics.

Ninety-three percent of the students had a computer in their home and 86% responded there were computers in their high schools. Of the 185 students who had computers in their high schools, 71% used the computer for in-class presentations, and 82% used computers for class assignments or homework, 39% used computers for personal use, and 61% completed a computer class. Ninety-nine percent of students had at least some exposure to computers prior to attending OSU ATI.

Most students (90%) also brought a computer to college with them. Of this 90%, 4% brought a desktop, 95% brought a laptop and 1% brought both a desktop and a laptop. It should be noted that a small percentage of OSU ATI students are commuters and this group may be included in the group of 22 students who did not bring a computer to campus. Interestingly, five of the students who did not bring a computer to college did not have a computer at home, four did not have access to one in high school, and one did not have one at home or in high school. The majority also thought they would be using a computer at least daily for school related activities, with most (69%) thinking they would use the computer two to four times per day for school.

Computer skill level perceptions of the incoming class of students at OSU ATI

The students were also asked to rate their overall computer skills in addition to specific types of computer skills. The results as a raw number and percentage can be seen in Table 2. The bulk of the students (65%) felt their overall computer skills were intermediate. Twenty one percent felt their skills were beginner, 13% felt their skills were advanced and 2% felt they had no overall computer skills.

As stated before, many faculty assume that incoming college students already have appropriate

computer skills. This research confirms that students perceive themselves as already having these skills and generally at an intermediate level. Not surprisingly the skills the students feel most confident in are the ones that they would partake in most often such as emailing, word processing, and using the Internet. This research did not measure the students' actual ability in these areas so no conclusion can be made to see if the students' perceptions of themselves match reality.

Perceptions of the importance of having computer skills for the incoming class of students at OSU ATI

When asked if they thought they would gain additional computer skills while in college, 91% responded "yes." The reasons why students thought their skills would improve included: more computer use in classrooms and assignments, Internet research, and taking a computer class. Of the 9% that answered no to the question, most stated that they would not gain any additional skills because they would not be taking a computer class or they already knew everything they needed to know in regards to the computer.

A majority of students (93%) also believed computer skills would be important for their future. Based on the reasons given, it was observed that most students were thinking of computers very narrowly in the sense of the actual computer hardware or software programs. However, some were thinking more broadly about computers, such as equipment and/or facilities being run by computers. The 16 students that said computer skills would not be important for their future careers seemed to have a very negative outlook on computers. Most gave reasons such as they would not need it for their career (artificial insemination technician, farmer, owner/operator of a winery, lawn

Table 2. Self-Perceived Computer Skill Level for Incoming Freshman Enrolled in Orientation Class at The Ohio State University Agricultural Technical Institute, Autumn 2010^a

Skill		None	Beginning	Intermediate	Advanced
Overall Computer Skills	#	4	45	139	27
	%	2%	21%	65%	13%
Internet Research	#	0	28	141	46
	%	0%	13%	66%	21%
Use a Word Processor	#	3	33	123	56
	%	1%	15%	57%	26%
Use a Spreadsheet	#	23	84	82	26
	%	11%	39%	38%	12%
Check and Send Email	#	5	24	88	98
	%	2%	11%	41%	46%
Edit Digital Photos	#	51	63	66	35
	%	24%	29%	31%	16%

^a Percentages rounded to nearest whole number.

maintenance) or that they did not like computers and therefore did not want to use them.

Since many students at OSU ATI come from rural backgrounds the authors also wanted to determine if student background (rural versus non-rural) impacts a student's perceived level of computer skills. Therefore, a single factor analysis of variance was performed and showed no difference in student perception of their computer skills between rural and non-rural students. Thus, the background of a student did not impact his/her perceived computer skill level.

Summary

Even though the assumption is that all incoming college students are "digital natives," this is not always the case, though it is reasonably accurate in the eyes of the student for the majority of students at OSU ATI. Though most students had access to a computer either at home or at school, some students did not, though this is a very small number. Indeed, a greater percentage of students attending OSU ATI had access to a computer in the home than in the general population of the United States (Marvist, 2009).

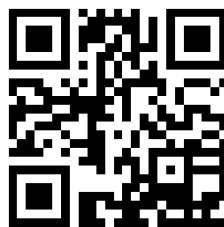
The background of the student (rural versus non-rural) did not impact his/her perceived computer skill level. The vast majority of students thought that they had intermediate overall computer skills. However, a few students admitted that they had no computer skills at all. All of the students surveyed thought that computer skills would be important while in college, and over 90% thought their computer skills would be enhanced in college. Yet, seven percent of students surveyed believed computer skills would not be important for their future careers. This research shows that most incoming college students do perceive themselves as having some computer skills, but the generalization that all college students are "digital natives" cannot be made. Future research will include faculty perceptions

of student computer skills and testing the students' actual skills to corroborate if their perceived skills and their actual skills are similar.

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For a short presentation about NACTA



Predictors of Performance in an Animal Nutrition Classroom



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Abstract

Animal Nutrition is a required course in animal science curriculums nationwide. Typical of required courses, the class is diverse in previous academic and animal experience. The objective of this research was to gather information about accurate student performance predictors to improve advising and course design. Data from 443 students, representing four semesters (Fall 2007-2010) of Animal Nutrition students, were statistically analyzed to determine predictive relationships between SAT scores, residency, transfer status, animal experience, major, gender, grade in a recommended Cornell general chemistry prerequisite (Cornell Chem) and performance in an introductory animal nutrition course (Animal Nutrition; Cornell University). In addition, an optional survey was administered to the 2010 Animal Nutrition class. In the survey, 27% of students self-identified animal experience level and 48% of transfers identified transfer status as influencers of their grade. Transfer status, residency, SAT scores, gender and grade in Cornell Chem were identified as significant predictors of performance in Animal Nutrition. The highest correlation for a predictor was Cornell Chem grade; completion of Chem was associated with significantly higher Animal Nutrition grades. Gaining information about accurate student performance predictors can assist advisors in making course recommendations as well as instructors in designing the course to best enable corporate learning regardless of the diversity in student preparation.

Introduction

Classroom diversity can manifest itself in a variety of ways. A heightened awareness of multicultural and ethnic diversity influences most university admissions policies as well as scholarship and extra-curricular programs. In animal science departments, the diversity of the undergraduate classroom has evolved considerably over the last century. It has

been characterized by an increase in the proportion of women as undergraduates over the last 50 years, which is now approximately 50 to 75% of animal science majors (Beck and Swanson, 2003). At the same time, increases in racial diversity have been less dramatic, with Blacks and Hispanics still largely unrepresented at all levels of academic degrees conferred (Beck and Swanson, 2003). The focal point of this research, however, was to examine additional discipline-specific aspects of diversity, which have been observed as first emerging, and now growing, trends in animal science departments: lack of animal experience and increase in transfer students (Allen, 1983; Taylor and Kauffman, 1983; Buchanan, 2008).

Diversity in background animal experiences is often the result of increasing proportions of urban students, fewer students coming from or planning to return to family farms, and more students studying animal science with the intention of applying to a college of veterinary medicine (Buchanan, 2008) or other professional program. According to the 1910 U.S. census, when many animal science departments were first created, 33% of the U.S. population was engaged in farming and ranching as opposed to 1% of the U.S. population in the 2000 U.S. census (Britt et al., 2008). Thus, early teacher-scientists in animal science discussed the challenges of how to stimulate students to be 'scholars as well as stockmen' (Taylor and Kauffman, 1983). Now, many students who enroll in animal science have experienced animals solely as companions rather than livestock (Britt et al., 2008). Moreover, the increasing number of students who transfer from a two-year college (Buchanan, 2008) or after any combination of one to three years of post-high school study, has also increased classroom diversity in the form of academic preparation for the course and prerequisites taken. In addition, study skills developed for classroom success and the type of examinations given vary among schools, providing

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yet another area of adjustment for transfer students. Cherney and Bell (2002) also reported that transfer students in their animal nutrition course were less likely to indicate veterinary medicine as a vocational objective. In a degree such as animal science where a large proportion of undergraduates plan to attain a post-graduate degree, this difference in postgraduate plans can further contribute to the diversity of student needs and expectations present in the classroom.

Obtaining information about accurate student performance predictors can assist advisors in making course recommendations; it can also aid instructors in designing the course to best enable corporate learning regardless of the diversity in animal experience and course preparation. Thus, the objective of this research was to discover predictive relationships between SAT scores, residency, transfer status, animal experience, major, gender, grade in a recommended general Cornell chemistry prerequisite (Cornell Chem) and performance in an animal nutrition course.

Materials and Methods

Animal Science Nutrition 2120 (Animal Nutrition) at Cornell University was chosen as a representative required course because the course material is a universal component of animal science curriculums nationwide. Moreover, there was no change in the instructor or the major course material covered in the four years during which data was collected. Students enrolled in the course enter with a wide range of academic and animal experience due in part to the high rate of incoming transfer students. Transfer students made up 30% of the fall 2010 incoming animal science majors. Moreover, the large class size, averaging 110 students, poses a challenge for the instructor in relating information to students according to their personal knowledge level and experience.

This study was deemed exempt by the Cornell Institutional Review Board. Non-identifying information, coded anonymously from the College of Agriculture and Life Sciences (CALS) was collected regarding the following predictors of class performance in Animal Nutrition: transfer status, SAT scores, NY state residency, gender, major and grade in Cornell Chem. Data was analyzed using Proc Mixed of SAS 9.2 (SAS Inst. Inc., Cary, NC). Due to missing SAT information for transfer students, results are displayed as each predictor individually regressed to Animal Nutrition course grade.

To supplement the data analysis and attempt to measure animal experience level of students, an optional survey was administered to the fall semester 2010 Animal Nutrition class with a 90.3% response

rate (Figure 1). Students did not receive an incentive and participation was voluntary.

Results and Discussion

The data collected from the CALS Registrar represented a total of 443 students from four semesters (fall 2007 through fall 2010). The dataset was predominantly made up of sophomores and juniors (89%). Most of the sophomores were four year students (93%) while the majority of the juniors in the course (77%) were transfer students. The high rate of transfer students in the Animal Nutrition dataset (29% overall) is not unlike that of other animal science programs with transfer students making up 19% of incoming animal science majors at the University of Wisconsin-Madison in fall of 2010, 29% at Texas A&M University and 22% at North Carolina State University (personal communication). In the optional survey administered to the fall 2010 Animal Nutrition course, 48% of transfer students self-identified transfer status as an influencer of their grade in the course (Figure 1). In response to the question of how transfer status influenced the respondent's Animal Nutrition grade, one student wrote, "Courses taken at other colleges were not as thorough as Cornell's equivalent classes" while another wrote, "Even though I'm a junior, this semester I feel like a freshman."

The mean grade in Animal Nutrition was 83.7 ± 8.8 . Significant predictors of Animal Nutrition grade include SAT scores, (both math and verbal), grade in the Cornell Chem prerequisite, NY state residency, transfer status and gender. Results are summarized in Table 1. Students performed better in the course if they were non-residents of NY state (84.8 versus 82.5; $P = 0.007$), non-transfers (84.4 versus 81.3; $P = 0.001$), and female (85.0 versus 79.0; $P < 0.001$). Moreover, these three predictors were correlated with each other in that the majority of transfer students were male, NY residents. For each additional point received on the SAT Math score, there was an additional 0.043 point increase in Animal Nutrition grade; likewise a point increase in an SAT Verbal score was associated with a 0.039 point increase in Animal Nutrition grade. In a similar analysis at Oklahoma State University, Vitale et al. (2010) identified cumulative GPA, major, gender and performance in prerequisites to be significant predictors of student performance in an undergraduate agricultural economics classroom while race, residency, transfer status and high school GPA were not.

In a model that included the terms transfer status, NY residency, GPA, gender, SAT scores and major, 70% of the variation in Animal Nutrition grade was

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explained by these predictors. However, only 297 of 443 observations were included because any record with missing data was deleted from the analysis; the majority of deleted records were transfer students missing SAT scores. Although SAT scores were correlated with performance ($P < 0.001$), they were not on record for 87% of transfer students. This prevents definitive conclusions about the strength of the relationship between SAT score as a predictor of Animal Nutrition grade for transfers. Most universities post demographic information in a document called a Common Data Set, published by their Office of Institutional Research. In a survey of U.S. universities with strong animal science programs according to the Chronicle of Higher Education, the Common Data Sets reveal that the majority of universities report the use of standardized test scores for admissions of first year, first time students as “Very Important” or “Important.” However, the same report reveals that few if any of these institutions require standardized test scores for admissions of transfer students.

Moreover, transfer students rarely take the recommended general chemistry prerequisite at Cornell University, despite the fact that Cornell Chem grade had the second highest correlation ($r^2 = 0.409$) with Animal Nutrition grade of any analyzed predictor (Table 1). Students who simply completed the Cornell Chem received a significantly higher grade in Nutrition (86.3 versus 80.6; $P < 0.001$). Animal Nutrition has long been recognized as an applied science in which a background in the fundamental sciences is ideal (Mitchell, 1936; Hoefler, 1968) and a strong foundational knowledge of chemistry appears to continue to significantly impact student performance in Animal Nutrition.

The highest correlation observed with Animal Nutrition grade was that of gender. While the authors are uncertain how gender influenced grade in Animal Nutrition, it was observed that being female was correlated with other predictors that had a positive, significant effect on Animal Nutrition grade. For example, female students were also more likely to be non-transfers and non-residents.

Cumulative GPA exhibited a high correlation but cannot be considered a true predictor of Animal Nutrition grade because GPA values were only present for students who had graduated Cornell by fall 2010; thus grade in Animal Nutrition is a predictor of final cumulative GPA rather than the reverse. High school GPA was not available in the Cornell dataset used for this analysis, but others have observed that high school GPA can explain more of the variance in university degree completion than ACT score, high school rank or learning style (Garton and Kitchel, 2005).

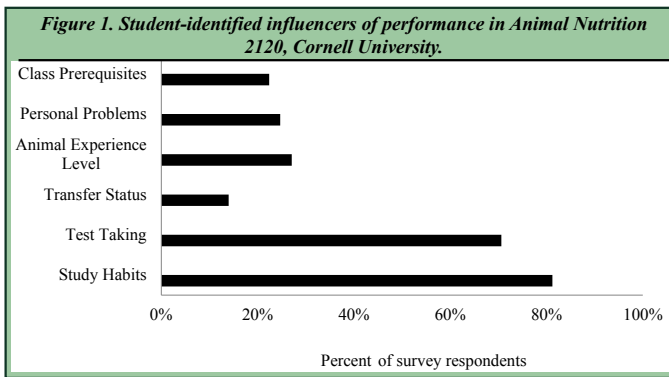
“Test taking” and “study habits” were the top ranking student-identified grade influencers, affecting 71 and 81% of students, respectively; this was considerably higher than animal experience, which affected 27% of students (Figure 1). Additionally, under “Other influencers of your grade in Animal Nutrition this semester” many students listed ‘competing courses’ (Figure 1). The self-identified issues of test taking and study habits were commonly shared among three-quarters of the class, and merit recognition by advisors and instructors. In order to address these student needs, instructors and advisors can utilize and promote local university resources, such as the Learning Strategies Center at Cornell University, and the optional one credit courses that many CALS programs offer to assist new students in adjusting to university life.

Though it is difficult to measure the effect of animal experience level on student performance in Animal Science courses, it has been recognized as an important aspect of diversity in Animal Science undergraduate populations (Buchanan, 2008; Allen, 1983). However, only 27% of students surveyed in the 2010 class felt animal experience level influenced their grade (Figure 1). In addition, the fact that animal science major was not a significant predictor, further negates the idea that animal experience is an important predictor of Animal Nutrition grade. Likely, the lack of significance for animal science major as a predictor of Animal Nutrition grade is influenced by the fact that the vast majority of students in the course (91%) were animal science majors. In one question of the survey, students characterized the type of

Table 1. Predictors of student performance in Animal Nutrition 2120 at Cornell University

Item	N	Grade	SE	P value	r^2	
SAT ¹ Math	299	0.043	0.006	$P < 0.001$	0.144	
SAT ¹ Verbal	299	0.039	0.005	$P < 0.001$	0.152	
Chemistry ¹	227	0.543	0.044	$P < 0.001$	0.409	
Chemistry	Yes	227	86.3	0.567	$P < 0.001$	NA
	No	216	80.6			
Residency	Resident	251	82.5	8.73	$P = 0.007$	NA
	Non-resident	192	84.8			
Transfer Status	Four Year	314	84.4	0.465	$P = 0.001$	NA
	Transfer	129	81.3			
Major	Animal Sci	403	83.5	1.39	$P = 0.854$	NA
	Non-major	40	83.8			
Gender	Male	107	79.0	0.814	$P < 0.001$	NA
	Female	336	85.0			

¹Grade signifies the additional point increase in Nutrition grade a student would expect to receive for each additional predictor point for these continuous variables.



animal experience they held. The majority (87%) had experience with a pet whereas only 55% claimed actual farm experience. It is worthwhile to note that farm experience included horse farms so the number of students with production livestock experience was actually less than 55%. Student comments on the survey included “I felt at a disadvantage because so many other people had so much experience already” and “Owning a pet did not help.”

To assist in alleviating student concern over lack of animal experience, the role of laboratory sections in providing practical animal experience has been and will remain a key component of animal science programs (Horvath and Inskeep, 1968). It is not possible to ascertain from this study whether student concern over their lack of animal experience as an influencer of their Animal Nutrition grade was real or perceived. In the future, pairing students according to their animal experience level in laboratories may be an effective strategy for handling this aspect of classroom diversity. Moreover, to address the needs of students who lack livestock animal experience, curriculum should continue to strive towards including fundamentals of livestock production as well as a variety of directed practical experiences. For example, Bell and Cherney (1999) integrated a semester-long lamb feeding trial into the Animal Nutrition course that allowed students to gain experience in handling and care of farm animals while applying theoretical lecture material.

Summary

Transfer status negatively impacts student performance in Cornell Animal Nutrition 2120. However, this research identified strategies that could be effective in improving the performance of transfers, such as utilizing SAT scores during advising or emphasizing recommended course pre-requisites like Cornell Chemistry. Although it was unclear from this study if student animal experience is influencing performance in Animal Nutrition, it has been recognized as an important aspect of diversity in animal science

undergraduate populations. Pairing students based on animal experiences during laboratories may be an effective strategy at easing student anxiety due to lack of animal experience. Moreover, to address the needs of students who lack livestock animal experience, curriculum should continue to strive towards including fundamentals of livestock production as well as a variety of directed practical experiences. Grade in a recommended Cornell Chemistry course and being female were more important predictors of student performance in Cornell Animal Nutrition 2120.

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Evaluation of a Community Nutrition Service-Learning Program: Changes to Student Leadership and Cultural Competence¹



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Abstract

Faculty at the University of Connecticut introduced an advanced service-learning course in community nutrition with the goal of delivering nutrition education and enhancing students' leadership skills, cultural competence, and understanding of contributing factors for childhood overweight in minority, low-income populations. Prior to enrollment, students completed a prerequisite community nutrition service-learning course. A mixed-methods design was used to evaluate perceptions of self-growth in leadership and cultural competence. Students demonstrated statistically significant improvement from pre-to-post semester on the overall score and several measures from the Student Leadership Practices Inventory (SLPI) and the Cross-Cultural Adaptability Inventory (CCAI). The significant changes to SLPI suggest improvements in teamwork, inspiring support, recognizing others' contributions, and collaboration. Analysis of reflections and discussion group transcripts suggest the students' opportunity to overcome obstacles and find affirmation in their growing capability played an important role building confidence. Students' noted self-growth in flexibility, adaptability, teamwork, risk-taking, self-confidence and the importance of being open-minded. They became aware of lifestyle differences and similarities with the multicultural children they served. Students made new connections about family food choices and childhood obesity. They realized sometimes their assumptions about the lives of the children were correct and other times they were not. Findings informed curriculum modifications.

Introduction

For decades agricultural programs have incorporated experiential learning where learners are situated within simulated or real world contexts as an opportunity to apply knowledge, problem solve and cultivate decision-making skills (Andreason, 2004; Marshall et al, 1998). Although experiential learning supplies a venue for hands-on learning that may enhance desired traits among graduates, service-learning moves one step further and has become widely popular across academic environments and majors. Service-learning is supported as a teaching strategy that fosters critical thinking, builds a sense of civic and social responsibility (Bailey, Carpenter and Harrington, 2002), and cultivates leadership skills (Dugan and Kornives, 2011) including collaboration, teamwork and communication (Eyler et al., 2001). Students who participate in service-learning show increased tolerance and appreciation of other cultures, reduced stereotyping, and recognition of the importance of social justice (Eyler et al., 2001). These traits mirror expectations of the Academy of Nutrition and Dietetics (AND, 2004; Accreditation Council for Education in Nutrition and Dietetics, 2008) and the American Association of Agricultural Education (AAAE).

Service-learning moves beyond experiential learning as a structured learning opportunity which connects classroom learning with the real world in a project addressing human or community needs while encouraging students to examine their attitudes and values relative to others (Bailey et al., 1999;

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Nokes et al., 2005). Structured learning objectives, thoughtful use of reflection, reciprocity of learning between students and recipients of the service, and opportunities to discover knowledge, skills and values are core components in the service-learning model (Seifer, 1998; Ozier et al., 2010). Educators have suggested that sequenced service-learning courses may be particularly effective as students can build on previous experiences and better integrate their service activities with academic objectives (Berle, 2006).

The Center for Public Health & Health Policy (CPHHP) at the University of Connecticut (UConn) coordinates sequenced undergraduate service-learning courses to deliver Husky Programs (HP); a nutrition education outreach initiative named after the university's canine mascot. Each course encompasses the key components for incremental skill building described in the service-learning, including a minimum of 15-20 hours in the field every semester, on-site training and supervision, high quality and quantity of reflective activities, and the ability to apply the service to the academic content of a class (Eyler and Giles, 1997; Jacoby, 1996). HP typically enrolls about 120 undergraduate participants annually to deliver weekly programs primarily in Hartford, a Connecticut city where the predominant race and ethnicity is African American/Black and Latino. The poverty rate and proportion of childhood overweight in Hartford far exceed national averages with 30% of children overweight in a random sample of 203 three-year olds (Goodell et al., 2009).

The entry-level HP course, introduced in 2000 and modeled after the national Reach Out and Read literacy program offers experiential learning where students promote healthy eating habits and physical activity through reading nutrition themed books with children. Students interact with the child and accompanying adult(s) in WIC clinics, health clinics and pre-school or day care settings. Undergraduates who successfully complete Husky Reads may enroll in a second-level course, Husky Nutrition, where students deliver cooking classes in after-school programs or guide food exploration in preschool programs following established curricula. HP presents students with the opportunity to apply classroom-based knowledge in the "real world," achieve personal growth, and build cultural competence while preparing for future employment and can aide in meeting AND competencies and preparing for dietetic internships.

HP commenced a third service-learning course focused on enhancing student understanding of contributing factors for childhood overweight in minority, low-income populations while increasing

leadership skills, cultural competence and commitment to civic responsibility. The advanced course, named by the inaugural class as "UConn Café" (Cool Activities and Food Exploration) required undergraduate students to successfully complete at least one introductory nutrition class and participate in Husky Reads, Husky Nutrition, or a similar community program prior to enrolling in the course. To foster growth in leadership, students received a higher level of responsibility and autonomy compared to other HP classes.

Following recommended practices in service-learning (Eyler et al., 2001), the course required:

- **Readings and Class Discussions** – Each week assigned readings focused on childhood overweight and the influence of poverty, urban living and ethnicity on dietary patterns.

- **Curriculum Development** – Each student designed one original lesson plan targeting healthy nutrition and physical activity following an established curriculum format and trained other students to implement it.

- **Community Service** – Each week student teams taught approximately 40 children, ages 6 to 14, at inner-city after school programs. Students had full responsibility for implementing the curriculum.

- **Reflections** – Each week students reflected on personal successes, problems, relationships and cultural factors through individually completed writing assignments and open class discussions.

For more details on the course design see http://publichealth.uconn.edu/CN/HEC_grant.php.

Corresponding with the implementation of UConn Café, the Center for Public Health and Health Policy sought to evaluate student perceptions regarding the influence of the course on their leadership skills, cultural competence and civic responsibility. Findings from the evaluation were also intended to inform what aspects of course design may be particularly beneficial or require modification.

Methods

The research team evaluated the effectiveness of participation in UConn Café over four semesters (2002-2003) following a mixed-methods approach. Methods included quantitative measurement of cultural competence and leadership skills. Qualitative assessment included analysis of discussion group transcripts and written reflection assignments. The UConn Institutional Review Board approved all methods. All enrollees agreed to participate and signed informed consent.

During the first and last class of each semester, students completed two validated self-assessment

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tools, the Student Leadership Practices Inventory (SLPI; Kouzes and Posner, 2006) and the Cross-Cultural Adaptability Inventory (CCAI; Kelley and Meyers, 1992). The SLPI is based on Kouzes and Posner's book *The Leadership Challenge* and its Five Practices of Exemplary Leadership®: 1) Inspire a Shared Vision—ability to have vision for the future, passionately communicate and enlist support of others; 2) Enable Others to Act—capacity to promote teamwork engaging others in process with mutual involvement, collaboration and empowerment; 3) Encourage the Heart—ability to acknowledge and celebrate contributions of others and foster pride in achievements; 4) Model the Way—setting expectations and role modeling appropriate behaviors to attain goals; and 5) Challenge the Process—willingness to scrutinize and transform the status quo through informed risk-taking and openness to learning from mistakes (Dugan and Kornives, 2011; Kouzes and Posner, 2002). Using the SLPI, students assessed their leadership practices ranking each of the 30 inventory items from 1 (rarely or seldom) to 5 (frequently).

The CCAI assessed an individual's ability to work or live with others from another culture. The inventory includes four dimensions of cultural competency: 1) Emotional Resilience—ability to deal with stress of a new environment in a positive manner; 2) Flexibility/Openness—ability to have a positive attitude and be open-minded to different cultures; 3) Perceptual Acuity—capability to accurately perceive the feelings of others who are culturally different; and 4) Personal Autonomy—ability to maintain a strong personal set of values while respecting the value system of others. Respondents rate each of the 50 items from 1 (definitely true) to 6 (definitely not true).

During the final class of each semester, the instructor facilitated a discussion group to explore student perspectives on their service experience, including perceived changes in attitudes, opinions and beliefs related to poverty, childhood overweight, cultural diversity, leadership skills and civic engagement. The facilitator followed a semi-structured discussion guide, including follow-up probes (Kruger, 1994). During the discussion, the facilitator requested specific examples, or stories to illustrate points raised by the students. The discussion was audio-taped and transcribed in full.

Two researchers, using an *a priori* coding schema constructed from the literature on attributes of leadership and cultural competency (Lloyd, 2006; Sue, 2001), coded the transcripts and reflections following grounded theory (Strauss and Corbin, 1990). The researchers applied emergent coding to elements that were repeatedly included in narratives to which the *a priori* codes applied and used qualitative software N6 (QSR International, 2005) for codebook organization. Both researchers independently coded the same transcript, then compared codes, and more strictly defined them to increase analytic reliability, and periodically discussed emergent codes and textual passages that might refine or expand the coding schema. The researchers developed cross matrices of all codes to look for relationships (Miles and Huberman, 1994) then used memoing to examine the meanings behind the codes and their interrelationships to interpret the findings (Lofland and Lofland, 1995).

Paired student t-tests were used to examine overall and subscale scores of the leadership and cultural competency instruments (SPSS, 16.0.2).

Results and Discussion

Participants (n=26) were primarily white females (n=23), nutrition majors (n=19), in their junior or senior year of college (n=22), and enrolled in the College of Agriculture and Natural Resources. (n=23). The average age of participants was 22 years with 24 of 26 students between the ages of 19 and 22 (range 19-46).

Table 1. Results of a Paired Student's t-test Comparing Pre- and Post-Semester Means on the Five Key Practices of Exemplary Leadership and the Overall Score of the Student Leadership Practices Inventory (n=26) (Kouzes and Posner, 2006)

	Pre-Semester		Post-Semester		t-value	Significance (2-tailed)
	mean	±S.D.	mean	±S.D.		
Key Practices ^z						
Model the Way ^y	3.9	0.6	4.2	0.5	1.58	0.126
Inspire a Shared Vision ^x	3.7	0.6	4.1	.04	3.04	0.005**
Challenge the Process ^w	3.4	0.5	4.0	0.5	1.60	0.121
Enable Others to Act ^v	4.1	0.6	4.4	0.4	2.70	0.012*
Encourage the Heart ^u	3.9	0.7	4.2	0.6	2.85	0.009**
Overall Score	19.4	2.3	20.9	2.1	2.72	0.012*

* , ** Denotes significance at p=0.05 or 0.01, respectively

^z Possible score for each of the key practices ranges from 6-30 and for the overall score from 30-150.

^y Ability to have vision for the future, passionately communicate and enlist support of others.

^x Capacity to promote teamwork engaging others in process with mutual involvement, collaboration and empowerment.

^w Ability to acknowledge and celebrate contributions of others and foster pride in achievements.

^v Setting expectations and role modeling appropriate behaviors to attain goals.

^u Willingness to scrutinize and transform the status quo through informed risk-taking and openness to learning from mistakes.

In discussing how UConn Café had impacted them over the semester, the students most frequently described events that had challenged their abilities or their prior beliefs. The general perspective was that through confronting real-life challenges, they had gained important leadership skills and cultural awareness. In their descriptions, the students consistently interwove relationship building with self-growth.

Leadership

The SLPI overall leadership score and three of the key practices –Inspire a Shared Vision, Enable Others to Act, and Encourage the Heart– significantly improved pre- to post-semester (Table 1). Model the Way and Challenge the Process scores improved but did not reach statistical significance. The significant changes suggest improvements in teamwork, inspiring the support of others, collaboration, recognizing the contribution of others and fostering pride. Student reflections and the final discussion groups emphasized personal growth in adaptability, self-confidence, and risk-taking as well as teamwork and the group process.

The students felt that their ability to adapt to the classroom situation improved greatly over the course of the semester. Students recalled unexpected challenges at their initial community sessions. *“Suddenly there’s a time change, or they didn’t expect us to show up, or the kids were not exactly receptive.”* Delivering nutrition lessons, *“You realize no matter how much you planned, there’s only so much you can control.”* At first the students reacted to these unforeseen events with uncertainty but they *“started to learn what works and what doesn’t”* and *“each time it got better.”* By the end of the semester, the students were more likely to describe themselves as “flexible.” *“We just went with the flow.”* Students also became more familiar with their teammates. They described how they progressed from functioning side-by-side to a collaborative effort. *“At first we didn’t have it. We would just stop. It wasn’t going to work,”* but *“Each time we went in we worked better together,”* and by the end of the semester, *“We had a bond.”* *“No one said anything. Things just kind of happened. It just worked.”* As students became better acquainted with one another, they learned the strengths of team members and felt comfortable depending on one-another. *“I don’t think I could have done it alone.”* *“With a little bit of input from each other, we put it all together. We realized our mistakes and weren’t afraid to admit them.”*

The students noted that their efforts were rewarded. *“As the kids got more comfortable with us, they were more willing to participate.”* *“When we came in they*

were clapping.” *“It was good to be working with the kids and being able to find common ground...even the adults, or the parents or teachers that we would see...you would see them nodding approval and being glad we were there and we were involved. It meant a lot to me and it has given me more confidence to relate to other cultures.. .”* As self-confidence grew, the students began to take risks, such as focusing the lesson on unfamiliar foods or putting the children in leadership roles. Sometimes they experienced *“a little bit of failure.”* Even so, they attributed value to the experience. *“You’re taking risks but you’re learning from those risks.”*

Some students felt participating in UConn Café increased their willingness to take risks and improved their leadership skills inside and outside of the service-learning experience.

“I know in my other work situations it has helped me to rise to the occasion and not have something prepared and being calm and say I’m going to get my point across, I’m organized in my mind. I know what I need to do and how to do it in a clear, concise way. So I think that has helped in other places too.”

The opportunity to overcome obstacles and find affirmation in their growing capability appears to have played an important role for participants while having important implications for future leadership activities. Engagement in risks or new challenges as described by the students is consistent with self-efficacy (Bandura, 1989) and trait theory related to the role of self-confidence in leadership (Lloyd, 2006). Higher levels of self-confidence and self-efficacy impact the pursuit of future leadership roles and engagement in challenging group tasks or new experiences (Wagner, 2011). Self-confidence can also increase comfort with decision-making, delegation of responsibilities, organization, and ability to gain trust (Lloyd, 2006).

Cultural Competence

Table 2 shows the results of the CCAI, which focuses on race-related cultural competency. The overall score and two dimensions, Emotional Resilience and Flexibility/Openness improved significantly; Personal Acuity showed an upward trend; no change was apparent for Personal Autonomy. Students attributed increases in their cultural competence to the class and to first-hand experience in the multicultural community. Differing from the CCAI, student perceptions of their cultural competence as described in reflections and discussion highlight age as the largest perceived cultural gap. Through the course, students’ general view of childhood overweight, particularly among children from low-income urban families,

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Table 2. Results of a Paired Student's t-test Comparing Pre- and Post-Semester Means on the Dimensions and Overall Score of the Cross-Cultural Adaptability Inventory (n=26) (Kelley and Meyers, 1992)

Dimension [†]	Pre-Semester		Post-Semester		t-value	Significance (2-tailed)
	mean	±S.D.	mean	±S.D.		
Emotional Resilience [‡]	85.1	8.5	88.8	6.2	2.76	0.011*
Flexibility/Openness [§]	70.0	8.3	73.0	6.4	2.16	0.041*
Perceptual Acuity [¶]	48.4	5.2	49.9	4.5	1.46	0.158
Personal Autonomy [‡]	33.3	2.9	34.2	3.2	1.15	0.610
Overall Score	236.7	19.1	245.8	15.2	2.72	0.012*

* Denotes significance at p=0.05

[‡] Possible score for each dimension: Emotional Resilience 18-108, Flexibility/Openness 15-90, Perceptual Acuity 10-60, Personal Autonomy 7-42, Overall 50-300

[§] Ability to deal with stress of a new environment in a positive manner.

[¶] Ability to have a positive attitude and be open-minded to different cultures.

[¶] Capability to accurately perceive the feelings of others who are culturally different.

[¶] Ability to maintain a strong personal set of values while respecting the value system of others.

changed. Many of the students acknowledged that at semester start they held “a lot of stereotypes,” or “preconceived notions.” One student noted, “When I thought about overweight and obesity before, I kind of thought of it as something people... could avoid if they wanted to.”

As the semester progressed, experience taught the students the importance of being “open-minded and non-judgmental” about differences as they began to question their assumptions and recognize barriers to addressing childhood overweight. The students realized that sometimes their assumptions about the lives of the children were correct and other times they were not. “Some of the children did not know common foods like whole wheat bread and squash.” “I was shocked that some of the kids had never tried peanut butter.” “When the [children] knew what cantaloupe was or where milk came from I was more surprised than I should have been.”

Several students also described barriers to playing or exercising outside. “At the entrance [of the site] there was this ‘gun free zone’ sign.” “There was nowhere to play.” “I always just thought they didn’t want to [exercise] and now I saw that some people just can’t. They don’t really have the options that others have, like parks or anything to go to.”

These types of surprises led to questioning of assumptions. “This made me think how many of their day to day activities are probably a lot different from my past experience.” Over the semester, students began making new connections about family food choices and childhood obesity. “I just never thought about the connection that processed foods are so cheap; especially for parents with reduced income or on welfare that have to get the cheap foods because they have to feed their kids.”

Students also realized the challenge of implementing successful and appropriate nutrition education interventions. “When you see it [obesity] in children and you see... you put a face to that, through all the readings and everything you thought about and come to really see how there’s this long line of factors that seem to be against these kids having healthy habits and healthy lifestyles, just really understanding how this system is almost lined up against them.”

“It’s definitely hard for them [the kids]. Their parents are doing it [eating and feeding the kids junk food] and then us as strangers come in and we’re like, ‘Oh, you’re actually not eating what you’re supposed to be eating and your parents are feeding you the wrong stuff. Here’s what you’re suppose[d] to be eating, but you don’t like it. Well, it’s healthy, sorry. You should eat it.’”

Many realizations made by UConn Café students mirror those found in other service-learning studies. Students participating in a service learning component for a nutrition course described the experience as a “true eye opener about the community” and described diversity between themselves and the children (Ash, 2003). In another study, dental hygiene students serving a community health center noted seeing a variety of complex child and community needs (Aston-Brown et al., 2008).

Perception of the Course

UConn Café students emphasized the benefit of the hands-on experience.

“You could read about it all you want and you’ll have all the stereotypes in your mind of maybe a different author or different facts and the way you view them but the only way you can know the truth is to go yourself.”

“I think being out there and being exposed to different cultures, and seeing, like you said, the different foods... or seeing their neighborhood; I think that’s the only way to get people to understand...The cultural competence I think comes from seeing what they are dealing with and seeing what they are working with and then, again, tailoring what they need and what their culture is.”

These findings consistently echo patterns found across disciplines. For example, Maiga and Westrom (2006) evaluated two animal systems courses with service-learning components. Participating student

survey responses suggested high satisfaction in the course. Ninety percent agreed that they learned more from the hands-on course compared to traditional lecture. Ninety-five percent learned the value of communication and Ninety-four percent improved critical thinking skills. As reported, the main skills acquired were working in a team environment, confidence, communication, improved leadership, and a sense of civic engagement. Students participating in Ash's (2003) evaluation of a nutrition-related service-learning project reported personal growth (47% of respondents), civic engagement (33%), and academic enhancement (17%) as the areas of biggest growth.

Future Service Plans

UConn Café participants noted new interests and an intent to increase volunteerism after the course. The class also appears to have spurred interest in community nutrition as a professional field and internship area for students aiming to become a registered dietician.

"This class has kind of shown me that it can be done ... the same idea can be carried through in so many different places. Not only in school systems...it's encouraging."

"If this is the kind of thing I can be involved in as a career, I would be there in a heartbeat..."

"I had never thought about community nutrition but after doing this I like it. I'd really like to make a difference..."

Summary

The use of service-learning in preparing college students is becoming widely applied. However, assessing the effectiveness of a service-learning course is difficult, often complicated by the "real world" setting, small samples, and complex objectives. Nonetheless, these results demonstrate the value of such evaluation. Even with the small sample, the results appear credible. Students who participated in different semesters discussed similar outcomes and results from two standardized measures, the SLPI and CCAI, demonstrated statistically significant improvement.

The qualitative phase of the evaluation provided insight beyond the standardized surveys. This may be partially attributable to divergent definitions of leadership in the SLPI, the course design and student perception; students view leadership as an individual position whereas academia largely defines leadership as relational (Lloyd, 2006). The SLPI defines student leadership as roles taken by a student relative to other students. UConn Café students mainly described leadership as their role with the children while efforts with their peers were termed "teamwork." What

students described as "teamwork" emulates aspects of relational leadership models and the types of skills desired as an outcome for the course.

The assessment also helped in identifying course strengths and areas for improvement. Discussion group transcripts and written reflections added depth to the evaluation by providing student perceptions of the community experience and its' influence on them. The students reported self-growth in their leadership skills and cultural competency. Comments from students were mainly attuned to age, food preferences, and physical activity which at times diverged beyond the course focus on leadership growth and cultural awareness. To better emphasize targeted areas, new opportunities and assignments have been designed to encourage students to spend time with the children's parents and at public spaces in the neighborhood. Many of the reading assignments now use articles from the city newspaper rather than generalized academic literature. Community-based stories bring the daily issues faced by the low-income families and the children the service-learning students are serving into the forefront. Through continual self-monitoring and keeping abreast of advances in the field, instructors can arrange experiences that meet the learning stages and specific needs of their students and the agricultural contexts they serve.

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Understanding Perceived Short-Term Outcomes from a Faculty Travel Abroad Experience in Ecuador



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Abstract

In an attempt to facilitate internationalization of undergraduate curriculum, eight faculty members from a land-grant institution participated in a short-term study abroad. Upon their return from the experience, participants were asked to reflect on changes from initial attitudes or beliefs, perceived benefits gained from participation in the program, and anticipated impacts on academic activities. Responses were analyzed using four variables: knowledge gain, change in attitude, increased skills, and aspirations. Two themes emerged concerning knowledge gain: change that occurred regarding the context of the research process, specific to research opportunities and knowledge gained from travelling with a diverse faculty group, and informational details about Ecuador, specifically regarding social systems, current issues, culture, and environment. Responses concerning a change in attitude were focused on the people of Ecuador, exhibiting shifts from a stereotypical to a broader mindset. Few participants described any opportunities to increase skill sets within their post-trip reflection activity, citing only opportunities to increase communication skills. However, numerous participants cited new aspirations, focused around the three areas of land-grant academe – teaching, research, and extension. These results suggest that participating faculty aspire to integrate global activities into their on-campus courses and research endeavors as a result of participating in this program.

Introduction

There is a growing demand for post-secondary graduates to be prepared to actively engage in a workforce that is no longer constrained by the limits of a singular custom or culture. Instead, graduates need to

be prepared for a diverse experience demonstrating a range of skills including the ability to work effectively in international settings; an awareness of and adaptability to unfamiliar cultures, major global issues, and currents of change; and a capacity for communicating across both cultural and linguistic boundaries (Brustein, 2007; Kreber, 2006). In obtaining this goal, the National Association of State Universities and Land-Grant Colleges (NASULGC, 2004) state that universities and colleges in America “must truly be universities and colleges of the world...[internationalizing] our mission—our learning, discovery and engagement” (p. v). An internationalized mission would result in college graduates who are able to demonstrate global competence, or the ability “not only to contribute to knowledge, but also to comprehend, analyze, and evaluate its meaning in the context of an increasingly globalized world” (NASULGC, 2004, p. 2).

Globalization of the university curriculum is often addressed through strategies including study abroad opportunities, travel courses, and globally-focused courses. U.S. student participation in study abroad opportunities has more than doubled over the past decade (Institute of International Education [IIE], 2010). However, only a limited number of students are taking advantage of these opportunities as demonstrated by the 260,327 out of the approximately 15.6 million undergraduate students enrolled in higher education institutions who participated in study abroad opportunities during that time period (IIE, 2010; National Center for Education Statistics, 2009). Aside from study abroad opportunities, faculty members bear the greatest responsibility for providing students with exposure to international content (Russo and Osborne, 2004). A panel of professionals with

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extensive international experience recently participated in a Delphi study (Bruening and Shao, 2005). Among the results in this study, the panel indicated a belief that undergraduates greatly benefit when exposed to information presented by professionals who had worked for long periods of time in international settings, and who integrate the corresponding cultural perspectives and contexts into their course material (Bruening and Shao, 2005). At the university level, teaching faculty may be best situated to fill this role. However, in order to do so, opportunities to gain international experience must be provided to teaching faculty.

One effort to increase the international experience of faculty was provided through Teaching Locally, Engaging Globally (TLEG) project. Funded through a USDA Higher Education Challenge Grant, this project was designed to provide teaching faculty from a U.S. land-grant university with the opportunity to travel to several locations in Ecuador in order to observe their subject area in the context of a different culture. During the experiences, faculty members collected data, pictures, and videos in order to assist them in developing reusable learning objects (RLOs) and case studies for their undergraduate courses that addressed contemporary issues in agriculture from a global viewpoint. RLOs are self-contained, digital learning activities created using a standardized structure and tagged with metadata that allows for cataloging and searching (Wiley, 2000). Ranging in length from 2 to 15 minutes, RLOs can either be used individually to support presented lecture materials or multiple RLOs can be linked to create a larger lesson. RLOs can be delivered in a variety of ways including in class, through an eLearning platform (i.e. Blackboard), or on an independent web page. RLOs can contain a wide array of media, including text, web sites, charts, maps, models, PowerPoint presentations, photos, case studies, simulations, video clips, audio clips, assessments. RLOs for this project have yet to be integrated into the curriculum.

Limited research has been done to evaluate the knowledge, skills, attitudes, and experiences that exist within global competence (Hayward, 2000; Hunter et al., 2006). Within the TLEG project, six objectives sought to identify changes for both faculty and student participants. Two of the four faculty-specific objectives indicated that participation in the program would result in the development of both favorable attitudes and enhanced knowledge of Latin American culture and global aspects of the respective discipline. Research was needed to better understand how participation in the TLEG project may have contributed to the development of global competence.

Rockwell and Bennett's (2004) Targeting Outcomes of Programs (TOP) model was used to frame a study of the outcomes from the TLEG project. The TOP model outlines seven levels of outcomes for a program: resources, activities, participation, reactions, KASA (knowledge, attitudes, skills, and aspirations), practices, and SEE (social, economic, and environmental) outcomes. Evaluation of learning outcomes, rather than program implementation outcomes, begins at the KASA level. Knowledge change seeks to identify whether participation in the program increased awareness, understanding, and/or problem solving abilities of the participants, while shifts in attitude are determined by change in outlooks, perspectives, or viewpoints (Rockwell and Bennett, 2004). Change in skills is determined through an improvement in abilities or performance, or with the development of new skills, while aspirations are gauged by examining participant ambitions, hopes or desires following participation (Rockwell and Bennett, 2004). According to Rockwell and Bennett (2004) these short-term KASA outcomes are necessary for changes in practice, behavior, or conditions to occur.

The purpose of this study was to gain an understanding of the short-term outcomes that teaching faculty amassed following an international experience. Specifically, the study sought to describe the changes in knowledge, attitudes, skills, and aspirations that participating faculty members from the University of Florida experienced following their participation in the TLEG trip to the country of Ecuador.

Methods

A basic qualitative research design was conducted for this study (Merriam, 1998). The researchers framed the TLEG project based on the assumption that learning occurs in complex social environments where learners actively construct meaning by reflecting on their experiences (Bandura, 1997; Kolb, 1984; Vygotsky, 1978). In this study, faculty participants are the learners, a trip to Ecuador was the experience, and learning was operationalized as short-term KASA outcomes which would be manifested in the reflective activities immediately following their return to the U.S.

The application process for the travel portion of the grant was presented to faculty throughout the College of Agricultural and Life Sciences (CALs), with selection being based on personal interest in Latin America and the desire to integrate an international perspective from these countries into their courses. The activities undertaken in this study were approved by the University of Florida Institutional Review Board

and signed informed consent was obtained from all participants. Faculty who participated in this study (N = 8) represented eight different departments: Agricultural and Biological Engineering; Agricultural Education and Communication; Agronomy; Family, Youth, and Community Science; Fisheries and Aquatic Sciences; Food Science and Human Nutrition; Religion; and Wildlife Ecology and Conservation. These participants travelled to Ecuador in July 2010 with members of the research team. The research team was made up of four faculty members from the Department of Agricultural Education and Communication at University of Florida, as well as two faculty members from the Department of Agricultural Leadership, Education, & Communication at Texas A&M University.

The 14-day trip included visits to three culturally and geographically different regions of Ecuador. The trip began with four days in the coastal tropics in and around the city of Guayaquil. Guayaquil is a major port city in Ecuador with a population of over 3 million. While in this region, participants interacted with faculty at Escuela Superior Politécnica del Litoral (ESPOL) University, visited an aquaculture research station, toured a residential farmer-training program, and experienced some of the cultural aspects of the city.

The second part of the trip was a four-day stay in the Andes highlands, in the isolated, 1000 person village of Salinas de Guaranda. During the day-long trip from Guayaquil to Salinas, the group made several stops to observe local agricultural practices. The central economic and cultural feature of Salinas is a cooperative called Salinerito. While in Salinas, participants stayed in a hotel managed by the cooperative and were able to interact with the local people. The participants toured many sites in and around Salinas including the cooperative, various agricultural operations, and a neighboring village's health clinic.

The group then traveled back to Guayaquil to fly out to the Galapagos Islands, a World Heritage Site. This portion of the trip included four days touring a wide variety of ecological sites and conservation programs. Participants stayed in a hotel on the island of Santa Cruz and traveled to other islands by boat. The group returned to Guayaquil for an overnight stay and then departed for the U.S.

Following their return, each participant was asked via e-mail to complete a reflection activity which consisted of seven open-ended questions. Three questions asked participants to state attitudes and beliefs as they were held following the travel experience, three questions asked participants to articulate the KASA

changes that they noticed from their reflection activity to the reflection activity, and one question asked for feedback on improving the travel experience for other faculty members. For the purposes of this article, the three questions which specifically addressed aspects of change from reflection to reflection were analyzed in order to identify the short-term outcomes cited by the participants. The questions asked, and responses of which were analyzed, were:

1. Did your experience change your initial attitudes/beliefs about participating in an international experience? Please specifically describe any changes that may have occurred;
2. Please describe any benefits you may have gained from participating in this international experience;
3. How do you think your participation in this international experience may or may not impact your future international teaching, research, and extension activities? Responses for each of the three questions were received from all participants.

The data from the reflection exercises were sorted into emergent themes using the constant comparative method of data analysis (Lincoln and Guba, 1985), which uses bits of data compared to others in order to identify similarities and differences which may be present (Merriam, 1998). Two of the researchers independently coded the data, then confirmed and revised the initial findings using procedures outlined by Lincoln and Guba (1985). Unlike the reliability and validity measures common within a quantitative study, qualitative studies rely on building confidence in the findings through methods which increase trustworthiness (Lincoln and Guba, 1985). Trustworthiness of the study was increased through the use of member checks, triangulation, and an audit trail (Lincoln and Guba, 1985).

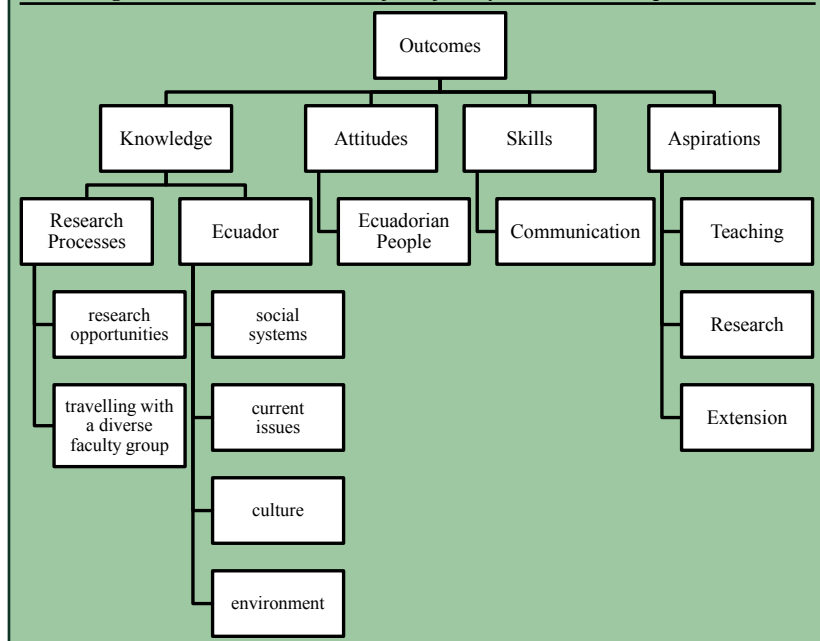
Results

Participants were asked to identify changes from their initial attitudes or beliefs, perceived benefits gained from participation in the program, and anticipated impacts on academic activities. Four variables were utilized during the analysis: knowledge gain, change in attitude, increased skills, and aspirations. Themes and sub-themes have been italicized for emphasis. For a summary of these findings, see Figure 1.

Seven of the eight participants cited a change in knowledge. Two themes emerged from the variable knowledge gain. One theme focused around the change that occurred regarding the context of the research process while the second was centered on details specific to Ecuador. Within the research

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Figure 1. Short-term outcomes from faculty international experiences



process theme, the two sub-themes that emerged were research opportunities and the knowledge gained from travelling with a diverse faculty group. Two participants specifically commented on a change in knowledge regarding various areas of research potential ranging from collaboration and location possibilities to shifts in research focus from content to social context, commenting that the trip provided “a grand view of what’s available in Ecuador in terms of working partnerships and locations and issues.” Furthermore, two participants described the knowledge gained from engaging with a diverse faculty group, citing the opportunity to learn about content from multiple disciplinary angles, the dynamics of international group work, and the research focus of fellow faculty members.

Within the Ecuador theme, four sub-themes emerged: social systems, current issues, culture, and environment. Three participants commented on the role of various systems within the social context observed over the course of the trip. Specifically, these participants cited the use of a local food system to create economic opportunity within a community, the impact of the Catholic Church on the social system of Salinas, and the nuances of how systems such as Liberation Theology and social change occur at the local level. One participant stated that “this trip helped me understand more nuances about how systems...and social change occur on the ground.”

Two participants identified current issues they learned of during the trip. One participant noted the existence of a range of environmental issues. The second participant observed the commonalities between rural Ecuador and the rural U.S., stating, “many of the

same problems that rural Ecuador faces are the problems that rural America faces – youth leaving rural areas for the cities, trying to balance ‘agriculture’ and the ‘environment,’ and maintaining a sense of community.”

Three participants remarked about the cultural knowledge gained over the course of the trip. One participant commented on gaining a better understanding of the Ecuadorian culture through conversations with people on the road or during meals. Another participant, in comparing this trip to previous trips within Latin American, noted observing an evident difference between the indigenous cultures of Ecuador and other indigenous cultures. A third participant, who described having a greater understanding both of the people and culture in Ecuador and the diversity within the country, also stated that “I really didn’t have much of a perspective on Latin American culture prior to the trip...In this experience, I think we saw the ‘feature movie’ of a country vs the ‘snapshots’ we get from most travel experiences.”

Two participants specifically mentioned knowledge gained about the environmental conditions in Ecuador. One participant learned about the ecological and marine systems of Ecuador as well as the regional differences in agriculture throughout the country. The second participant described a shift in beliefs about the climate in Ecuador when commenting, “I was most surprised about the climate and the terrain on the Galapagos Islands, where I expected it to be warm and more tropical. It was cool and almost semi-arid.”

Five of the eight participants, in their post-trip reflection activity, cited a change in attitude. The variable change in attitude centered on regard of the Ecuadorian people. Five participants each commented in various ways on their changed perspective that occurred as a result of this trip. One participant commented on how the experience of engaging with Ecuadorians changed “my views and my schema from the stereotypical Latin Americans as ‘dramatic’... and aggressive ...to even-keeled and calm, as well as polite and meek (and enormously accommodating and kind).” Two participants cited a gain in appreciation for the social and cultural diversity within the region. One participant recounted the change in perspective that occurred upon hearing from locals in Salinas about the perceived favoritism that occurs at the hand of the church, stating “the church has done a lot for the town,

but hearing another 'side' to the story was interesting and did revise my beliefs." A fifth participant described how the perceived poverty of the nation had previously limited the desire for engagement relative to other Latin American countries, but that this experience had now provided the opportunity to see the value in working with these communities.

Only two of the eight participants described any opportunities to increase skill sets within their post-trip reflection activity. The variable change in skills was only related to changes in communication skills. One participant described taking advantage of the opportunities within this trip both to "*adjust to a new culture...and [to] attempt to practice respectful inquiry into...the places that I visited.*" A second participant commented on the opportunity that this trip provided for practicing the Spanish language, affording the opportunity to learn new words.

Six of the eight participants cited new aspirations within their post-trip reflection activity. The variable aspiration was composed of three themes focused around the three areas of land-grant academe – teaching, research, and extension. Half of the participants specifically described their aspirations for integrating this experience into the undergraduate classroom, such as utilizing specific case studies created from this trip to discuss concepts often taught in an abstract manner, incorporating RLOs from the trip into the classroom, and locating a textbook which provides students with a global, cross-cultural perspective. Others noted a desire to develop student study abroad programs in Ecuador, stating an "*increased confidence regarding my ability to promote international experiences for our students and perhaps becoming involved in organizing such experiences.*" Within the research theme, two participants specifically commented on new research aspirations regarding partnership, location and topic possibilities both in Ecuador and with University of Florida faculty who also participated in this trip. Two participants cited how involvement in this trip had changed their vision of working in Florida Extension, specifically in creating international exchanges with contacts in Ecuador for both Florida Extension personnel and 4-H youth as well as learning Spanish to better engage the Spanish-speaking population in Florida.

Conclusions and Discussions

This project was specifically designed for faculty within colleges of agricultural and life science. The themes delineated from the data were a result of the experience which had been orchestrated specifically to address the disciplinary backgrounds of the faculty

participants. However, faculty participants also gained valuable new insight as a result of this experience, discovering ways to explore research questions through new collaborations and varying cultural lenses.

When planning an international experience for faculty members, it is important to recognize the potential for interaction within the group. By bringing together faculty from various backgrounds, participants gained an appreciation for other disciplines outside their own. This collaboration has the potential to stimulate novel and creative ventures among faculty who may have not had the opportunity to do so otherwise (Gillespie et al., 2010). Likewise, the merit in identifying potential partnerships across borders is valuable (Gillespie et al., 2010).

It is also important when planning an international trip to have participants recognize their own beliefs about the proposed location and peoples they will interact with. One particular theme, Ecuadorian people, seems to suggest that while most faculty participants indicated a change in perspective, most also entered into the project with fairly narrow viewpoints of the people of Ecuador. Some participants noted a shift from a stereotypical viewpoint as a direct result of their personal interactions with Ecuadorians. When individuals have an opportunity to consider their relationship to an experience prior to engaging in that experience then the change becomes much clearer (Kolb, 1984). Furthermore, participants must be ensured time during the course of the trip to interact with local delegates both professionally and socially, allowing the trip to move beyond a simple site-seeing tour.

A main objective of the TLEG project focused on how participants envision themselves using this travel experience to further their work in a U.S. land-grant institution. The three themes focused centrally around the land grant mission and included teaching, research and extension. From a teaching viewpoint, faculty participants' desire to continue to promote international experiences for undergraduates supports the positive effect of the experience. Using contextual applications of the experience to bring to life the various abstract ideas found in many content areas is also a novel approach to teaching. Future travel opportunities should build on the potential of this collaborative, contextual approach in the hopes that the act of collaboration will aid participants in being more creative and insightful as they explore ways to make their experience beneficial for their students.

Faculty participants also demonstrated an increased knowledge in the research process. The research theme showed that faculty participants

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were more of aware of multi-disciplinary, multi-cultural opportunities. Reinforcing aspirations for this type of collaboration becomes a challenge with limited support from departments (Dewey and Duff, 2009). Therefore, when planning this type of travel opportunity, it is crucial to integrate opportunities to discuss and engage in collaborative efforts upon return, either through frequent meetings or facilitated research-based discussions. Within the TLEG project, faculty participants met formally on four different occasions to debrief about the trip, as well as to discuss RLO development and cultural integration into the undergraduate classroom. Research regarding student response to RLO implementation is currently being conducted.

Finally, the extension theme focused on the perceptions of faculty regarding parallel extension opportunities in both the U.S. and Ecuador. Extension opportunities mentioned involved working with Spanish-speaking populations as well as youth development programs. While a central focus of the TLEG project involves the impact of this experience on presented information in the undergraduate classroom, it is difficult to deny the potential influence that this type of international experience can have on the many facets of a faculty member's academic appointment.

Summary

The 14-day trip to the country of Ecuador impacted faculty participants in a variety of ways, operationalized as changes in knowledge, attitudes, skills, and aspirations (see Figure 1). Participants expressed changes in knowledge about research opportunities in Ecuador and opportunities to collaborate with other participants. Participants also conveyed changes in knowledge about social systems, current issues, and environmental conditions of Ecuador. Faculty on the trip indicated changes in attitudes about the people of Ecuador. Participants also noted changes in communication skills, both in terms of Spanish language skills and cultural competency. The experience also changed aspirations of participants, built around all three missions of the Land Grant university. Faculty aspired to change their teaching by developing study-abroad programs, integrating global activities into their on-campus courses, and adopting culturally sensitive textbooks. In terms of research, faculty aspired to develop new partnerships, conduct research in new locations, and research new topics. When thinking about their extension roles, faculty aspired to use their new contacts in Ecuador to facilitate exchanges and to improve their own interaction with Spanish-speaking people in the U.S.

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The University of Georgia Avian Biology Study Abroad Program in Costa Rica



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Abstract

Students enrolled in the College of Agricultural and Environmental Sciences (CAES) at the University of Georgia traditionally had not participated in study abroad programs at a rate similar to the rest of the student body at the University. This lack of study abroad involvement by students in the College was related to the shortage of study abroad opportunities with content geared towards them. Therefore, an Avian Biology Study Abroad Program in Costa Rica was created in 2008 to complement and enhance the avian biology major offered through the Department of Poultry Science within CAES. Student participation has reached the targeted goal each year of 15, 18, and 20, for a total of 53 students. Testing and survey results indicate that student learning objectives have been met and that students have been very satisfied with the overall experience of the program. Pre/post-test results show a 43% gain in knowledge from the study abroad experience. The mean overall rating of the course by students for years 2008-2010 was 5.0 out of 5.0 and the mean rating of overall quality of the program, for the same period of time, was 4.8 out of 5.0. All but five of the participating students have been fulltime enrolled CAES students. In addition, 19 of the participants were avian biology majors and seven more became avian biology majors after participating in the program. Thus, the Costa Rica Avian Biology Program has provided a capstone opportunity to avian biology majors and increased the study abroad participation of CAES students.

Introduction

With about 2,000 students participating in study abroad programs during the 2009-2010 school year, the University of Georgia (UGA) ranked tenth in the nation among higher education institutions for the number of students who study abroad each year (Simmons 2011). More specifically, the number of UGA students who participate in study abroad

programs that were shorter than eight weeks, placed UGA fourth in the nation among doctoral/research institutes (Institute of International Education Open Doors 2011). As a result of UGA's commitment to provide international educational opportunities to its students, almost 30% of the total graduates from UGA each year have participated in a study abroad course during their academic program, and the University now has faculty-led programs on every continent (University of Georgia 2011).

Despite the University's overall stellar record in student involvement in study abroad experiences, students enrolled in the College of Agricultural and Environmental Sciences (CAES) within the University had participated in study abroad programs at a rate of less than 10% of each graduating cohort. The demand for agricultural programs to provide college students with an international perspective has been noted by several organizations and studies (APLU 2009, Nassar 2004, NRC 2009, Zhai and Scheer 2002). Although the CAES had strived to incorporate various forms of international awareness into its curricula, this was not resulting in CAES students seeking study abroad experience and, as Crunkilton et al. (2003) indicated, weaving topics, sections, or a few lectures of internationally-related issues into curricula is not sufficient to provide students with understanding, compassion, and empathy for different global cultures. Previously, McPherson (2001) had argued that the time for debate as to whether colleges of agriculture and life sciences should incorporate international experiences into curricula had long passed and that it was now time to ask how agricultural colleges could participate in the internationalization of education through study abroad opportunities. This challenge was met by the Department of Poultry Science within the CAES. In 2008 the Department created a three-week, Maymester Avian Biology Study Abroad Program based on the hypothesis that the lack of study abroad involvement

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by students in the CAES was related to the shortage of study abroad opportunities with content geared towards them and taught by faculty within the College. The program was also developed to complement and enhance the Department's major in avian biology which it initiated in 2004.

Materials and Methods

Identifying the Country or Region of Study

One faculty member and one graduate student directed by this faculty member were given the responsibility to plan, design, and conduct the Avian Biology Study Abroad Program. Costa Rica was chosen as the destination for the program because it has many diverse, but distinct, ecosystems which allow over 850 species of birds to thrive in a country that is slightly smaller in size than the state of West Virginia (Henderson 2002, Wainwright 2007). In addition, in 2001, the University of Georgia purchased a farm in the Monteverde region of Costa Rica and has since developed it to be a fully operational campus. In the fall of 2005 the University of Georgia opened the Costa Rica Office at its main campus in Athens, Georgia to promote and recruit students to participate in study abroad programs at its Costa Rica campus and thus the support structure at the home campus to initiate a new study abroad program was in place. Finally, a graduate student with travel experience in Costa Rica, which included a semester long study abroad program in ecology and serving as a naturalist for seven months at a research facility, was selected for planning the program.

Planning the Program

Locations within different ecological zones of Costa Rica were chosen to allow the examination and analysis of the natural habitats and evolutionary adaptations of avian species in each of these habitats and to provide the student participants the opportunity to see at least 250 species of birds, as well as a diverse array of mammals, insects and plants (Henderson 2002, Zuchowski 2007). The three-week program was designed to utilize biological stations as well as ecological preserves and resorts to immerse students in the premontane cloud forest, lower montane rain forest, tropical dry forest, Caribbean lowlands, and Pacific coast lowland ecological zones (Henderson 2002). Lectures for the six-credit-hour course (POUL 4150, Field Studies in Avian Biology) were adapted for each environment in order to illustrate to students the incredible array of physiological and anatomical

adaptations as well as nutritional strategies that bird species of Costa Rica use to limit their competition with one another. The course was also designed to encompass field components which comprise about 80% of the course learning objectives and activities. The field learning components include guided bird and nature hikes that occur at least twice a day, and guided boat tours of mangroves and coastal estuaries on the Pacific and Caribbean coast locations.

A goal of any study abroad experience is to introduce students to other cultures and, as a CAES program, this experience is also needed to provide participants an appreciation for international agriculture and environmental perspectives. Therefore, other field learning components beyond avian biology were chosen to provide students the opportunity to gain an appreciation of the Costa Rican culture, conservation efforts, and sustainable and organic farming practices. Recreational activities were also planned to provide both direct and indirect cultural exposure. For example, one site visit is to a family farm near Monteverde that grows organic coffee that is sold to the local Co-Op Santa Elena, a fair-trade coffee cooperative that sells under the brand Café Monteverde. The small farm also produces sugar cane, beans, bananas, and other fruits and vegetables. The farmer and his family provide in depth knowledge about cooperative and organic farming practices as well as about their daily life. In addition, the students observe methods of harvesting sugar cane and then are able to extract the juice from the cane by hand powering a century-old trapiche (Figure 1). The extracted juice is either consumed as a fresh beverage or concentrated by boiling.

To provide further knowledge resources to the student participants, the same Costa Rican, bilingual travel guide with a degree in ecology has been hired each year for the duration of the trip. In addition, each location visited has staff guides which are very valuable in providing information about Costa Rica as well as the location of elusive flora and fauna.

Equipment and Group Projects

Due to the nature of the course and its focus on birds, appropriate reference books and specialized equipment were purchased to help observe, identify and record the avian fauna throughout the country. For bird identification, the course utilizes several copies of *The Birds of Costa Rica* by Richard Garrigues (2007) and many students opt to purchase and bring their own copy of this field guide with them. Other field guide references provided by the course include *Wildlife of Costa Rica* by Carrol Henderson (2002), *The Mammals of Costa Rica* by Mark Wainwright (2007) and

Figure 1. Students observe how to harvest sugar cane and then are able to extract the juice from the cane by hand powering a century-old trapiche. The extracted juice is either consumed as a fresh beverage or concentrated by boiling.



Figure 2. With assistance from course equipment such as binoculars, spotting scopes, HD video cameras and SLR digital cameras (top left), students are able to acquire and practice avian field identification skills, identifying over 250 species each year. A few rare species that are typically observed on the course are the Resplendent Quetzal (top right), Great Curassow (bottom left), and Great Green Macaws (bottom right).



Tropical Plants of Costa Rica by Willow Zuchowski (2007). It is recommended that students bring their own waterproof binoculars, though the program has purchased several pairs for loan if needed. Additional equipment purchased for the course includes three digital SLR cameras with zoom lenses (Figure 2), two spotting scopes, three high definition video cameras with night recording capabilities and three laptop computers for student group projects.

Bird watching in the tropics is much more difficult than in the temperate zones due to the dense foliage and lack of sunlight under the canopy. At the beginning of the course, an introductory birding lecture is conducted that includes binocular and spotting scope use, birding etiquette, and field marks to look for on the birds. The students are also trained on the use of the photography equipment used to document what they have observed.

Using the observational techniques learned and the provided equipment, the students work in small groups to create photo and video documentaries as well as write essays depicting the immense array of flora and fauna seen, green initiatives observed and culture learned. The student projects and written reports are presented at the end of the trip. These group projects and reports combine several skills including observation, reflection, collaboration, and public speaking to reaffirm and test comprehension of the knowledge that the students have learned in the three-week duration of the program.

The students are pre and post tested to assess their gain in knowledge over the course. The same test covering bird biology and identification as well as Costa Rican culture, geography, and agriculture was given at both the start and end of the program. In addition, student surveys were conducted at the end of the program to determine overall student satisfaction and to provide an indication of things that could be changed to enhance the program. Students were asked questions to evaluate both the course and the overall program using a scale from 1 to 5 with 1 = poor, 3 = average, and 5 = outstanding. Open-ended questions were also asked to encourage students to write their thoughts on the program experience.

Results and Discussion

Program Popularity

The University of Georgia now has over 25 Costa Rica study abroad programs, yet the Avian Biology Maymester has met its targeted enrollment goals of 15, 18 and 20 students for the years 2008, 2009 and 2010, respectively. A total of 53 students have participated

in the Avian Biology Study Abroad Program in Costa Rica. Of the total students that have participated, 49 have been from the University of Georgia and 48 of these students have been enrolled in the CAES. The remaining four students enrolled in the CAES as transient students to participate in the program. The faculty members of the Department of Poultry Science advise more than 700 students enrolled in the animal health, avian biology, biological science, and poultry science majors within the CAES. Of the 48 CAES participants, 19 were avian biology majors, 18 were biological science majors, five were animal health majors, four were poultry science majors, one was an animal science major and one was an environmental economics and management major. The overwhelming participation in this program by CAES students supports our original hypothesis that providing a study abroad program with content geared towards these students and taught by faculty within the College would encourage their involvement in such a program.

The avian biology study abroad program was also created to enhance the relatively new avian biology major offered by the Department of Poultry Science. The created study abroad program has served this purpose by providing a capstone experience for many avian biology majors. In addition, the program has been an effective recruiting tool for the major. Seven students that participated in the program subsequently changed their major to avian biology.

Knowledge Gained

Pre-program test results indicate a base knowledge average of 44%, while the post-program test average of 87%. This is a 43 point gain in knowledge attributable to the instruction and overall experience of the three-week course. It has been readily evident by the end of the program each year, that the student participants are knowledgeable about basic avian science, can site-identify common Costa Rican birds, and are familiar with the natural history of dozens of species of birds. Each year, about 250 bird species, representing over 50 avian families, have been observed throughout the country. These birds include several near threatened, threatened, vulnerable, or endangered species such as the Resplendent Quetzal (near threatened), Black Guan (near threatened), Great Curassow (vulnerable), Bare-necked Umbrellabird (vulnerable), Three-wattled Bellbird (vulnerable), and Great Green Macaw (endangered) (Figure 2) (BirdLife International IUCN Red List for birds 2011).

Student Satisfaction

The course designed for this study abroad program has been well received by the student participants from the first year (Table 1), and thus, has not been altered for subsequent years except to provide new topics and creative angles for the assigned group photo and video documentaries. In contrast, aspects of the overall program logistics were changed based on student dissatisfaction from the first year of the program (Table 2). For the first year the staff of the University of Georgia Costa Rica Office handled the planning of

the daily logistics of the program and conducted the orientation for the program. This seemed logical given their experience in doing this for the University's other Costa Rica study abroad programs. However, this did not work well because their experience was based on programs that stayed entirely at the University of Georgia Campus in Costa Rica or used the campus as their base for excursions to other locations in Costa Rica. Because the Avian Biology program only visited the University of Georgia Campus briefly, the orientation provided by the Costa Rica Office staff and the arrangements made by them using several vendors were not suitable for our program.

After the initial year, the instructor and graduate student for the program started to handle all aspects of the program with the help of the tour company that employs our program guide. This decision has allowed us to better prepare our students through orientations preceding our departure for the program (Table 2). In addition, the continuity provided by utilizing one tour company for all local arrangements has been invaluable. The addition of a constant tour bus driver throughout the program that is also highly knowledgeable about the wildlife and agricultural practices of the country has especially benefitted the program by allowing an increase in the number of student participants without a decrease in faculty and staff to student ratio. In addition to having a constant bus driver, having the same local, bilingual guide with a degree in ecology has provided insight and perspective on local bird population shifts, climate change, and effective conservation practices that faculty from the United State could not provide without being constant residents of Costa Rica.

The anonymous student evaluations for the program were very valuable in summing up their thoughts about the overall experience. Some primary examples are: *“Doing birding in the field and complementing that with lecture and activities allows the student to constantly reinforce what we learned daily. I will never forget certain lessons I have learned here,”*

Table 1: Summary of course perceptions of students participating in the Avian Biology Maymester in Costa Rica program from 2008 to 2010¹.

	2008	2009	2010	Mean
1. Stimulation of interest in subject matter ²	4.8±0.11	4.8±0.09	4.7±0.11	4.8±0.06
2. Instructor concern for students ³	5.0±0.00	4.9±0.06	4.9±0.07	4.9±0.03
3. Academic quality and appropriateness of workload for the program environment	4.5±0.29	4.6±0.20	4.6±0.17	4.6±0.12
4. Course organization ⁴	4.9±0.09	4.8±0.13	4.8±0.12	4.8±0.07
5. Methods of instructions ⁵	5.0±0.00	4.9±0.08	4.9±0.11	4.9±0.05
6. Critical thinking ⁶	4.9±0.09	4.8±0.12	4.7±0.13	4.8±0.07
7. Overall rating of the course ⁷	5.0±0.00	5.0±0.00	4.9±0.07	5.0±0.03

¹Values are the mean response for each question using a scale from 1-5 with 1 = poor, 3 = average, and 5= outstanding, of the 15, 18 and 20 students participating in year 2008, 2009 and 2010, respectively.

²Question continued: One measure of an instructor's success is the ability to convey enthusiasm for and generate interest in the subject matter. How well did your instructor(s) do so?

³Question continued: In a positive learning environment, an instructor shows respect and concern for the intellectual development of students. How well did your instructor(s) do so?

⁴Question continued: A well-organized course provides the student with a syllabus that outlines the course topics and assignments and clearly defines how the students' grades will be determined. How well was this course organized?

⁵Question continued: An instructor can use a variety of teaching and learning strategies to guide students toward an understanding of course material. How well did the instructional methods help you to understand course material?

⁶Question continued: A major goal of UGA Costa Rica's study abroad programs is to foster critical thinking. How well did this course improve your ability to think critically on your own about the subject matter?

⁷Question continued: Taking into account the many qualities that contribute to a good course, rate the overall quality of this course.

Table 2: Summary of program perceptions of students participating in the Avian Biology Maymester in Costa Rica program from 2008 to 2010¹.

	2008	2009	2010	Mean
1. Accuracy and usefulness of orientation programs and materials in preparing for the program	2.5±0.32	4.8±0.09	4.5±0.17	3.9±0.17
2. Safety of program locations, facilities, excursions, and transportation	4.1±0.32	4.6±0.18	4.1±0.14	4.3±0.12
3. Choice of locations for excursions, field trips and site visits	4.7±0.15	4.8±0.09	4.8±0.10	4.8±0.06
4. Overall effectiveness of program staff in managing program	3.2±0.31	4.9±0.08	4.8±0.16	4.3±0.20
5. Overall effectiveness of your program's professor and staff in dealing with students' academic and personal needs and concerns	5.0±0.00	4.9±0.12	5.0±0.05	5.0±0.05
6. Value of program in relation to the cost	4.8±0.11	4.8±0.09	4.9±0.11	4.8±0.06
7. Overall quality of the program in relation to your expectations	4.7±0.15	4.9±0.08	4.8±0.09	4.8±0.06

¹Values are the mean response for each question using a scale from 1-5 with 1 = poor, 3 = average, and 5= outstanding, of the 15, 18 and 20 students participating in year 2008, 2009 and 2010, respectively.

"I loved the Study Abroad Program. It opened my eyes to the world of birds and I will forever look for birds instead of just looking at the scenery around me," "I am happy that my first trip out of the country was one so deeply immersed in culture and nature," and other similar sentiments were the most frequent on students' list of positive experiences. Overall the student participants have been very pleased with the course format having a strong field component as reflected best by one student who wrote, *"The experience I had here cannot even begin to compare with conventional classroom learning. I feel as though I have put to practice what others will never take out of the classroom."* When asked of the value of the course in relation to cost, replies included, *"Especially valuable for this length of a trip and the birds we saw,"* and *"Best value ever! Would have paid twice as much!"* The cultural component of the course also left a significant impact with comments including, *"Writing the paper on conservation made me really admire the Costa Ricans and their way of life. It makes me want to make the United States more advanced in conservation,"* *"Walking through the towns of each place we stayed, I feel had the greatest impact. It was so different from home and it was interesting to see the livelihood,"* and *"Seeing the culture & experiencing it helped me appreciate the people and their lifestyle."*

Summary

In response to a need to increase the globalization of the students enrolled in the CAES of the University of Georgia, the Department of Poultry Science initiated an Avian Biology Study Abroad Program in Costa Rica. The three-week summer program has been conducted successfully for three years and has significantly increased the number of CAES students that study abroad. It has also been an effective recruiting tool for the avian biology major and has provided a unique capstone experience for students enrolled in this major. Results from post-course surveys indicate that students were satisfied and perceived the experience to have had a very positive impact on their future academic endeavors, personal growth, and cultural understanding and awareness. This program will continue to be an indispensable component of the CAES undergraduate student experience and already has served as a model for the development of other successful study abroad programs within the department of poultry science and other departments within the CAES.

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The Equine Anatomy Project: Program Development and Student Opinions of a Necropsy Laboratory Compared to a Necropsy DVD



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Abstract

As part of the growing equine science major at North Dakota State University, a junior-level equine anatomy and physiology course was developed in 2009. Subsequently, The Equine Anatomy Project was created to secure equine cadavers that would provide undergraduate students with the opportunity to participate in a necropsy lab. Prior to the necropsy laboratory, a detailed prosection DVD was shown to prepare students for the experience. In an effort to gauge the utility of the DVD, as well as the necropsy lab, an opinion survey was administered to the 2010 and 2011 classes. Results include responses from 39 of 48 students (81.3% response rate). Overall, 92.2% of the students strongly agreed or somewhat agreed that watching the DVD prior to the necropsy lab better prepared them for the experience, 87.2% strongly disagreed or somewhat disagreed that the DVD could replace the lab, and 89.7% strongly agreed or somewhat agreed that future classes should watch the DVD prior to the lab. From these results it was concluded that students regarded the DVD as helpful in preparing them for necropsy lab; however the majority felt the DVD could not replace the necropsy experience.

Introduction

Controversy surrounding the use of animals for dissection can be traced back as early as the 16th century (Klestinec, 2004) and the debate continues today (Balcombe, 2001; Hart et al., 2005; Moore, 2001). Evidence exists that supports (Johnson, 2002; Theoret et al., 2007; Korf et al., 2008), refutes (Balcombe, 2001; Waters et al., 2005) and finds no difference (Strauss and Kinzie, 1994) between dissection as a superior means of learning and alternative strategies (e.g. clay sculpting, interactive computer programs, DVDs, or plastinated models). This lack of congruity in the

research suggests there is still a place for dissection opportunities in higher education.

The equine science major at North Dakota State University (NDSU) was developed in 2002, with curriculum expansion in 2009 leading to the development of an undergraduate junior-level equine-specific anatomy and physiology course. Paralleling the course development process, the issue of unwanted horses in the U.S. became apparent. Unwanted horses have been defined as those horses deemed no longer useful by their current owners because they are injured, old, ill, dangerous or because they no longer offer what their owners expected (Lenz, 2008; Messer, 2004). According to a report by the U.S. Government Accountability Office (GAO, 2011), there has been an overall decline in equine welfare since 2007. This decline in equine welfare is evidenced by a growing number of horse abandonment cases, as well as increased investigations of equine abuse and neglect (GAO, 2011; Smith, 2009). In an effort to secure equine cadavers to meet the primary course goal of enhancing student understanding of internal anatomy and to provide a meaningful outlet for unwanted horses in North Dakota and Minnesota, The Equine Anatomy Project was created.

The NDSU program was modeled after The Willed Body Program at the University of Florida's (UF) College of Veterinary Medicine (Reyes-Illg, 2006). The UF program was developed to obtain ethically sourced animal cadavers and tissue (Martinsen and Jukes, 2007). 'Ethically sourced' refers to animal cadavers and tissue that have been obtained from animals who died of natural causes or were euthanized due to severe injury or terminal disease (Jukes and Chiuia, 2006). Striving to obtain ethically sourced equine cadavers, as well as protect the health and well-being of teachers

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and students, all of the following criteria must be met in order for equids to be donated to NDSU for euthanasia and subsequent use for teaching purposes:

1. Outside veterinary approval;
2. Equids must have a medically untreatable condition or be living with a condition that does not allow the owner to provide necessary care for the equid to live a comfortable life;
3. Equids may not have strangles, colic, neurologic conditions, or a condition that requires immediate euthanasia (within 24 to 48 hours);
4. Horse owners are required to sign a Donation and Euthanasia Release Form that has been reviewed and approved by the NDSU general counsel acknowledging the equid is to be euthanized for teaching purposes.

Approval from the NDSU Institutional Animal Care and Use Committee currently allows for up to 12 horses over a three year period to be donated for euthanasia and subsequent teaching use. Costs for euthanasia and carcass disposal after class labs are covered by a \$25 per student lab fee.

In an effort to measure student opinions of the utility of a prosection (i.e. a demonstration of dissection that is accompanied by narration) DVD, as well as student opinions of the necropsy lab where both prosection and dissection techniques are employed, the following objectives were developed for this project:

1. Determine if students perceived viewing an equine necropsy on a DVD would better prepare them for an actual necropsy;
2. Determine whether students felt a DVD could replace an actual necropsy.

It was hypothesized that students would perceive viewing the DVD as helpful in preparing them for the necropsy lab and that students would not feel the DVD could replace the experience of viewing an actual necropsy.

Materials and Methods

This study was deemed exempt by the NDSU Institutional Review Board (#AG11140). Undergraduate students (n = 48) enrolled in ANSC 364 Equine Anatomy and Physiology in the spring of 2010 and 2011 completed a survey to measure their opinion of the utility of a prosection DVD [produced by the Royal (Dick) School of Veterinary Studies at the University of Edinburgh, Scotland] in preparing them for the actual necropsy experience. Students needed to indicate that they both watched the prosection DVD and participated in the necropsy lab for their survey results to be included by checking the appropriate responses below:

- I DID watch the prosection DVD prior to participating in the necropsy lab.
- I DID NOT watch the prosection DVD prior to participating in the necropsy lab.
- I DID participate in the necropsy lab.
- I DID NOT participate in the necropsy lab.

Students were then asked three questions with responses on a five-point Likert scale (1 = Strongly Agree, 5 = Strongly Disagree).

1. I feel that watching the prosection DVD prior to the necropsy lab better prepared me for the necropsy lab experience.
2. I feel that watching the prosection DVD could completely replace the necropsy lab.
3. I would recommend future classes watch the prosection DVD prior to the necropsy lab.

Responses of 39 students (81.3%) who both watched the DVD and participated in the necropsy lab were included in the final data summary. Student demographic data was collected separately from course records and included major, gender, and class.

Results and Discussion

A demographic summary of all students is displayed in Table 1 (n = 48). Combined data for 2010 and 2011 showed that equine science majors comprised the majority of students, followed by Animal Science, Veterinary Technology, Microbiology, Psychology, Nursing and Non-degree. As expected for a junior-level class, upperclassmen encompassed the majority (70.8%) of students. The gender distribution of female and male students were mirrored by national statistics that reveal 92% of animal sciences students with an equine concentration are female (Food and Agricultural Education Information System, 2009).

Table 1. Demographic Summary of Students Enrolled in ANSC 364 in 2010 and 2011 (n = 48)

Demographic	Year		Total %
	2010 <i>n</i>	2011 <i>n</i>	
Major			
Equine Science	12	9	43.8
Animal Science	4	7	22.9
Veterinary Technology	5	4	18.8
Microbiology	2	1	6.25
Psychology	1	1	4.1
Non-degree	1	0	2.1
Nursing	1	0	2.1
Gender			
Female	23	22	93.8
Male	3	0	6.2
Class			
Freshman	1	0	2.1
Sophomore	9	4	27.1
Junior	5	10	31.2
Senior	11	8	39.6

The Equine Anatomy Project

Survey results are summarized in Table 2 (n = 39). The vast majority of students strongly agreed or somewhat agreed that watching the DVD better prepared them for the necropsy lab. When asked if they felt the DVD could completely replace the lab, the majority of students strongly disagreed or somewhat disagreed the DVD could replace the necropsy lab. Finally, most students would recommend future classes view the DVD prior to the lab.

Table 2. Survey Responses of Students Enrolled in ANSC 364 in 2010 and 2011 (n = 39)

Question	Response	Year		Total %
		2010 n = 19	2011 n = 20	
1. I feel that watching the necropsy DVD prior to the necropsy lab better prepared me for the necropsy lab experience.	Strongly Agree	14	11	64.1
	Somewhat Agree	4	7	28.1
	No Opinion	0	1	2.6
	Somewhat Disagree	1	0	2.6
	Strongly Disagree	0	1	2.6
2. I feel that watching the necropsy DVD could completely replace the necropsy lab.	Strongly Agree	1	2	7.6
	Somewhat Agree	1	0	2.6
	No Opinion	0	1	2.6
	Somewhat Disagree	5	3	20.5
	Strongly Disagree	12	14	66.7
3. I would recommend future classes watch the necropsy DVD prior to the necropsy lab.	Strongly Agree	15	10	64.1
	Somewhat Agree	3	7	25.6
	No Opinion	1	2	7.7
	Somewhat Disagree	0	1	2.6
	Strongly Disagree	0	0	0

From these results it appears that students view the necropsy lab as a more useful experience than simply watching the DVD, but that the time taken to watch the DVD is worthwhile in preparing students for the lab experience. Although this survey did not measure learning, Theoret et al. (2007) reported significant improvement in exam scores of veterinary anatomy students who received prosection instruction on an actual cadaver compared to students who received prosection instruction via video. This suggests that cadaver prosections are more effective than video demonstrations. Johnson (2002) found students who performed dissection scored higher than students who were peer taught and observed dissection. Conversely, numerous studies have found either no difference (Granger and Calleson, 2007; Nnodim et al., 1996) or improved learning with alternative strategies to dissection (Hart et al., 2005; Strauss and Kinzie, 1991).

There are a number of considerations not taken into account by this survey that would considerably enhance the breadth and depth of data collected in future classes. Firstly, a measure of student learning would be helpful in determining if the resources that

go towards the necropsy lab are justified. Secondly, including demographic data on each survey would allow calculation of correlations to gender and major. Thirdly, the level of student involvement in the necropsy lab needs to be considered because it varies from simply viewing the necropsy to actively dissecting out organs and anatomical structures. Students in the equine anatomy and physiology laboratory are not required to participate in the dissection process. Those that choose to participate once the body cavity is opened are instructed on how to proceed. Finally there is the issue of students who may conscientiously object to the necropsy lab, even though the cadavers are ethically sourced. For these students, alternative resources such as plastinated specimens (Stuart and Henry, 2002), clay modeling (Oh et al., 2009), and The Glass Horse DVDs (2004 and 2007) maybe be utilized to teach anatomy.

Summary

Thus far, the NDSU Equine Anatomy Project appears to be a beneficial program for students, horse owners, and equids. At the end of each semester, students are asked to anonymously write down on index cards a high point of the class and low point of the class. These assessments consistently cite the necropsy lab as the top high point of the class. Additionally, horse owners who donate their equids to the project frequently express unsolicited feelings of comfort knowing that even after death, their horse is providing a learning experience for students (Anonymous owners, personal communication). Finally, the author believes equids who are donated to this project experience improved welfare as a result of their timely euthanasia, and that the Equine Anatomy Project provides an option for unserviceable and unwanted equids in the North Dakota/Minnesota region of the U.S. Further research into learning differences between the DVD and lab experience may aid in justifying the resources devoted to each exercise.

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Best Practices for Teaching Equine Reproduction in an Online Learning Environment: A Delphi Study



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Abstract

The purpose of this study was to describe the best practices for teaching equine reproduction in an online environment. A Delphi method was used to reach a three-round consensus of suggested best practices employed for teaching lecture- and laboratory-type topics, as well as recommended assessment techniques. The expert panel was formed by an exhaustive worldwide search for instructors currently teaching an online equine reproduction course. Consensus resulted in the following best practices for teaching equine reproduction lecture-type topics: assignments, multiple exams over the course of the semester, lectures that mirror the textbook in logical order, PowerPoint presentations with pictures, quizzes, summary notes, videos, and vocabulary lists. For laboratory-type topics, local area work experience was the sole best practice result. Best practices for student assessment were quizzes and vocabulary lists. Practitioner recommendations centered on assisting faculty in becoming stronger online instructors. Some recommendations included participating in professional development workshops, becoming involved in communities of practices, and exploring other disciplines' successful methods of online instruction. Research recommendations included repetitions of this study involving a larger participant population and a broadened examination of best practices for all laboratory-based animal science disciplines.

Introduction

New technologies and methods are continually discovered and implemented in all areas of animal science; from new feed technologies to new products and practices related to livestock production and reproduction. One means of successfully sharing these innovations are through classes and seminars offered at colleges and universities. These classes are important to the advancement of the horse owner and breeder population's knowledge and creation of new ideas. There is a limitation, however, in that a large part of the population may not be able to access this new information based on geographical location or time availability. Regardless of the equine-based subject matter topic, information should be accessible for the benefit of every student.

Instructors worldwide recognized this need by shifting the learning paradigm from traditionally delivered courses to online instruction (Schmidt and Miller, 2005). As early as 1999, research in the animal science genre indicated an increase in popularity, and need, for computer-based educational programs as a means of educating students and the public (Barnes et al., 1999). However, concerns with courses that are traditionally offered as "lecture with laboratory" in a face-to-face format, such as is sometimes the case in animal science, arise when discussions turn to online delivery options. Quality of instruction, limitations on learning, and limitations with student interaction are just a few of the criticisms identified by faculty with

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teaching post-secondary science-based courses in an online environment (Miller, 2008). Miller identified and debunked six myths surrounding delivery of science-based online courses, thus leaving little excuse for the supposed obstacles.

Why should animal science faculty be concerned with making subject matter more widely available in an online environment? In 1998, there were more than one million horses reported in Texas, which represented 15% of all horses nationwide (Gibbs et al., 1998) and, as an effect of the 109th Congress' American Horse Slaughter Prevention Act (2006), these numbers have increased greatly in the current decade (Durfee, 2009). People own horses for many purposes including recreational use, income, transportation, and pets (Endenburg, 2010). By making equine science information more available to the public, increased awareness and knowledge may be distributed to the growing population of equine owners, helping them make educated decisions about what is best for each horse. These decisions may include daily feed requirements for a horse, safe and appropriate methods of equine reproduction, limitations and restrictions on a horse through evaluation of conformation, as well as posing any other essential inquiries concerning the health of the equine industry.

Currently, new technologies are presented via seminars, symposia, research journals, and popular publications developed and implemented by professionals and universities. Texas A&M University (TAMU), in College Station, TX, like many other universities across the country, annually offers a plethora of workshops designed to meet specific needs regarding the equine industry (TAMU, n.d.). Courses are designed to increase education for students of all ages and disciplines; however, these methods are limited as they are offered only once or twice each year and in specific locations. Limited delivery relegates courses as geographically inaccessible to many. Similarly, potential participant concerns surrounding the cost of attending a seminar, publicity and awareness of the seminar, and even determining interest in attending all pose problems. One alternative, printed material such as magazines and journals eliminate the travel and costs of seminars and symposiums; however, topics are limited by publication space and one-way, passive delivery methods.

Students continue to desire online course offerings in all disciplines, so colleges and universities strive to meet such demand (Song et al., 2003). Computer-based courses in animal science are still a relatively new, upcoming technology that may be a contributing factor in reaching a population less capable of

attending seminars or symposia, yet who prefer more active means of learning than research journals (Zirkle, 2003).

Bing et al. (2011) focused on identified challenges when designing an online veterinary anatomy class. Veterinary anatomy is a key element in all courses of animal science and typically requires long hours in the laboratory combined with hands on evaluation. The purpose of this study was to determine if animal anatomy could be taught through a distance education style as effectively as a face-to-face laboratory. Following a pretest-posttest design, results indicated no significant difference in the test scores between the distance education students and the face-to-face students. These results support the conclusion that animal science material can be taught effectively in a distance education format (Bing et al., 2011).

Equine science courses traditionally require extensive hands on experience. There are few programs offering online resources for information about horses. The development of eXtension HorseQuest in 2010 began the discovery of ways to offer equine information online (Greene et al., 2010). eXtensions HorseQuest was developed to engage the expertise of equine specialists at the national level, and to provide continuous trusted information nationwide (2010). Programs such as this are leading the online charge in bringing equine education to the masses.

Equine reproduction is the basis of all equine production (Samper, 2009). There are many methods and technologies developed to make the reproduction process as efficient as possible. Equine reproduction education is important for those who desire to operate a successful breeding program business, as well as for those seeking to breed a backyard horse. When horse owners and producers have the most current and appropriate knowledge and skills, equine reproduction improves because those producers are making better and more informed decisions (Charles Sturt University, n. d.). Today's educational professionals must not only make this information available, but they must also administer it in a format understood by the student. As instructors in animal science, generally, and equine reproduction, specifically, strive to meet the needs of a changing demographic audience, the problem remains that instructors may lack perspective beyond traditional delivery methods to assist students in acquiring both the knowledge and the skills necessary for success, while still delivering from a distance.

The purpose of this study was to identify the best practices for teaching equine reproduction in an online environment. The objectives specific to this study were to:

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1. Describe the demographics of faculty currently teaching equine reproduction in an online environment.
2. Compile the best practices for teaching equine reproduction lecture-type topics in an online environment.
3. Compile the best practices for teaching equine reproduction laboratory-type topics in an online environment.
4. Compile the best practices for student assessment in an online equine reproduction class.

Methods

To meet the purpose and objectives of this study, a Delphi method was employed and administered with the assistance of Dillman's Tailored Design Method (2000) for administering online questionnaires. The Delphi method was designed for a controlled debate, independent of personalities, and maintained anonymity (Gordon, 1994). Experts in the inquired discipline are identified and asked to participate in a number of sequential questionnaires. Each subsequent questionnaire assembles upon the response of the preceding round (Henson, 1997). Opinions are synthesized at equal weight by researchers then distributed to the expert panel for further analysis and feedback until consensus is reached.

To determine the panel of experts for this study, identification of all programs offering courses in equine reproduction was first necessary. An exhaustive search of accredited colleges and universities worldwide offering animal science programs (N=102) was completed through a web search (CollegeBoard, n. d.; National Center for Education Statistics, n. d.). From that list, the search was further narrowed to include equine science specializations. Fifteen individual postsecondary institution websites were then searched and departments whose webpages indicated equine science coursework offerings received electronic communication inquiring about equine reproduction online courses. Eleven institutions internationally responded that an online equine reproduction class was part of the institution's curriculum and provided current instructor names and contact information. Those instructors, therefore, comprised the initial panel of experts for this study. Approval was sought from Tarleton State University's Institutional Review Board to conduct the study. The protocol was deemed exempt from the approval process.

The identified equine instructors teaching online equine reproduction were then asked to participate in the inquiry regarding the best practices for teaching equine reproduction in an online environment. Eight

current professionals responded with agreement to participate as an expert panelist in the study. Initial contact through electronic email followed via the guidance of Dillman's Mail and Internet Survey Tailored Design Method (2000). Using the Tarleton State University's Qualtrics Survey Software, the panel of eight experts was asked to respond to the following three open-ended questions, as well as demographic questions:

1. Describe the best instructional practices you utilize for teaching traditionally lecture-type topics in online equine reproduction courses. Describe as many practices as you deem appropriate.
2. Describe the best instructional practices you utilize for teaching laboratory-type topics in online equine reproduction courses. Describe as many practices as you deem appropriate.
3. Describe the best assessment practices you utilize for assessing student performance in online equine reproduction courses. Describe as many practices as you deem appropriate.

As described by Gordon (1994), the number of respondents is typically small, so Delphi studies are not intended to construct statistically significant results. Four of the eight instructors chose to complete the instrument, providing for a 50% response rate. Following the distribution, reminders were sent six, ten, and 14 days after the initial participation request. As recommended by Dillman, researchers should send as many as three requests for participants. However, in this study four requests were sent as a means to exhaust all efforts to gain participation. As noted by Bardecki (1984), there is usually a steady decrease of participants following the initial survey round and 44%-55% was deemed acceptable. This study maintained 100% participation throughout the study.

From the responses of round one, a list was comprised of all practices submitted by respondents. The second questionnaire was designed with a Likert-type scale, rating each practice from 1 to 4 where 1 = strongly disagree and 4 = strongly agree. Round two was distributed for consideration and review. Experts were also allowed to list any additional methods or ideas deemed appropriate. In review of the data, items yielding a mean of 3.25 or greater, with no disagreeing scores by respondents, were selected for convergence in the final round. Traditionally, a mean of 3.5 or greater is selected (Melnick, 1999; Trexler and Parr, 2006; West, 1988); however, for this panel comprised of only four participants, researchers chose items yielding a mean of 3.25 or greater, with no disagreeing scores (one or two) by the respondents to be included in the final round.

The final round sought convergence of opinions concerning the best practices for teaching equine reproduction. The panel members were asked to indicate simple agreement or disagreement with each of the 11 statements. As noted from McCampbell and Stewart (1992), Delphi studies usually reach a consensus in the final round.

Results

With respect to the demographic questions, the expert panel consisted of four full-time faculty members across a diverse age group. One respondent (25%) was in the 46-55 range, two (50%) were in the 56-65 range, and one (25%) was in the 66 and older range. Respondents indicated teaching experience at the post-secondary level for 10 to 30 or more years, where 50% had no teacher certification background, 50% previously taught secondary courses, and 25% earned teaching certification for the secondary level.

Delivery platforms previously taught by the instructors, and respondents could respond to more than one choice, were traditional face-to-face courses (75%), strictly online courses (75%), and blended (face-to-face with online components) courses (100%). Respondents were also asked to indicate their faculty assignments regarding teaching and/or research appointments. Of the choices, two respondents were assigned to teaching only, one had an equal division between teaching and research, and the final respondent was assigned to a 60% teaching and 40% research position. Courses taught annually ranged from two respondents who taught three online courses (50%) and two who taught eight online courses with intent across all respondents to increase that number in subsequent semesters. The number of students enrolled in the respondents' online classes ranged from 45 to more than 100 students annually.

To address objectives two, three, and four, three open-ended questions were sent to the eight panelists in the first round. Four respondents replied in the first round and sustained participation in the study throughout all three rounds. Dalkey (1969) indicated a minimum of 13 usable responses required for the Delphi method; however, as only eight institutions worldwide offered equine reproduction science through online delivery, the researchers were able to maintain consistent 50% participation from initial point of contact.

An *a priori* determination was made to retain all items with a mean greater than or equal to 3.25, with no disagreeing responses, for inclusion in round three. Nine of the thirteen items from question one were retained (Table 1), one item from question two was

retained (Table 2), and two items from question three moved into round three (Table 3).

Respondents in round one returned thirteen suggested teaching methods as best practices for teaching traditional lecture-type equine reproduction topics in an online course (Table 1). Mean scores from Round 2 are also displayed in Table 1.

Table 1. Expert Panelist Responses for Teaching Lecture-Type Topics in Equine Reproduction Online Courses

Lecture- Type Topic	Round 1 ¹ (f)	Round 2 ² (M)
Assignments	3	3.75
Lectures that mirror textbook in logical order	1	3.75
PowerPoint	3	3.75
PowerPoint with pictures	2	3.75
Quizzes	1	3.5
Summary notes	2	3.5
Vocabulary lists	2	3.5
Videos	2	3.5
Exams (Multiple over course of semester)	1	3.25
Assignments with strict deadlines	1	3.25*
Required textbook	1	3.25*
Workbooks	1	3.25*
Final exam	1	3.00*

Note. *Item received at least one response of “disagree” or “strongly disagree”.
¹Round 1 in Tables 1-3 included open ended questions
²Round 2 in Tables 1-3 included Likert-type scale responses of 1=strongly disagree, 2=disagree, 3=agree, and 4=strongly agree

In examining the initial 13 methods, there was a wide range of techniques implemented between professionals. One respondent indicated that the selected methods may not be the best available, but those were the best methods about which the respondent was most familiar. This response may be an indication that equine reproduction information formatted for online use may not be currently available in a user-friendly design, as well as that equine reproduction online faculty may be better equipped if they examine other disciplines for innovative teaching techniques.

Panelists responded with four techniques considered useful for teaching traditional laboratory-type topics in an online equine reproduction course (Table 2).

Table 2. Expert Panelist Responses for Teaching Laboratory-Type Topics in Equine Reproduction Online Courses

Lecture- Type Topic	Round 1(f)	Round 2(M)
Work Experience in local area	1	3.50
Field trips	1	3.00*
PowerPoint with pictures	1	2.75*
No Laboratory component included	1	1.75*

Note. *Item received at least one response of “disagree” or “strongly disagree”.

Three of the four members of the panel stated that, at the time of the study, a laboratory portion of the course was not offered; however, respondents opined that one would be highly valuable in online courses. PowerPoint presentations are to be considered an option, but they may eliminate hands on experiences.

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Local area work experience was the only method agreed upon by respondents for teaching laboratory-type topics. Comments indicated that field trips and work experience, while desirable, are often not feasible due to high enrollment or geographical location.

Six items were deemed appropriate for assessing student performance. These practices included online exams, video assessments, essays, online discussions, short answer, and quizzes; all items garnered a frequency of one. Only two items were carried through to the third round.

Table 3. Expert Panelist Responses for Assessing Student Performance in Equine Reproduction Online Courses

Lecture- Type Topic	Round 1(f)	Round 2(M)
Quizzes	1	3.50
Short answer exams	1	3.25
On-Line exams	1	3.25*
On-Line discussions	1	3.00*
Essays	1	3.00*
Video Assessments	1	3.00*

Note. *Item received at least one response of “disagree” or “strongly disagree”.

Online discussions, essays, and video assessments all yielded a mean response of 3.00 with one additional comment added by a respondent indicating too much difficulty in setting criteria for online discussions.

The third round was developed from responses to the second round questionnaire. Using a dichotomous rating scale of yes or no, all participants were asked to provide an indication of simple agreement or disagreement with all listed items presented as the preeminent practices for teaching equine reproduction through an online environment. All four of the panel members responded to this round (100%). Consensus was reached in the third round regarding best practices of teaching and assessing equine reproduction in an online format (Table 4).

For traditional lecture-type topics, the methods that reached consensus were PowerPoint with pictures, lectures that mirror textbook in logical order, assignments, vocabulary lists, quizzes, summary

Table 4. Best Practices for Teaching and Assessing Equine Reproduction Online Courses

Best practices

Lecture-type topics
 Assignments
 Exams (multiple over course of semester)
 PowerPoint with pictures
 Quizzes
 Summary notes
 Videos
 Vocabulary lists
 Practices for laboratory type topics
 Local area work experience
 Practices for student assessment methods
 Quizzes
 Short answer essays

notes, videos, and multiple exams taken over the course of the semester. The only online method of teaching laboratory-type topics deemed adequate by all of the respondents was mandatory local area work experience; requiring students to reach out to local breeding operations as a means of gaining hands on experience with current technologies in the equine breeding industry. For assessing student progress through the duration of the course, the acceptable practices included quizzes and short answer questions. This was consistent with the earlier inclusion of multiple exams over the course of the semester.

Discussion

The purpose of this Delphi study was to gain consensus from an informed panel of experts on the best practices for teaching and assessing students enrolled in equine reproduction in an online environment. Jones and Hunter (1996) distinguished two natures of agreement. One form would be the extent to which the participant agrees with the item of consideration, the other is the extent to which the participants are in agreement with one another. An overall consensus was achieved for the recommended practices for lecture- and laboratory-type instruction, and assessment of student progress. Four respondents listed as many practices and methods as they deemed necessary for teaching an online equine science course.

According to Bawane and Spector (2009), when determining critical roles for online faculty, being a teacher, first and foremost, is most desired. Even though the respondents in this study may be older than the assumed age of most faculty teaching online, literature indicates their experience teaching is highly valued (2009). This experience noted, however, caution should be exercised when generalizing the results of this study to the entire population of equine science instructors as exposure to and experience with technology (Rogers, 2003), willingness to adapt educational innovations (Loucks et al., 1998), and efficient engagement in online courses (Arbaugh, 2010) may not be practices reflected by this particular panel of experts.

Illustratively, panelists indicated that assignments, multiple examinations over the course of the semester, PowerPoint with pictures, quizzes, summary notes, videos, and vocabulary lists should be utilized. Inclusion by the respondents of examinations as a teaching technique was contradictory to the teaching and learning literature whereby assessment (examinations) assumes mastery of the content (Mager, 1997). So as not to hinder responses, though, examples of teaching techniques were not provided, but a follow-

up questionnaire regarding inclusion of examinations as a teaching technique may be warranted for future research.

Another contrary finding was that lectures that mirror textbook in logical order was one of the highest rated teaching methods, while a similar item indicating use of a required textbook was ranked near bottom. Instructors may be choosing to use other methods, such as personally developed notes or study guides based on multiple text or electronic sources for students to follow, instead of relying on a single textbook. Dickson et al. (2005) reported that 75% of students who completed a textbook study guide, rather than simply reading a textbook, performed significantly better on examinations than those who did not; providing support that some form of study manual is beneficial to the performance of the student.

Another unforeseen result was the lack of support for assignments with strict deadlines as it would seem strict deadlines would be important for the overall success and completion of the course. Mason and Weller (2000) implied that working in an online environment requires increased self-discipline as compared to traditional face-to-face instruction. If that is true, why was 100% agreement not reached regarding this practice? Could it be that assignments with strict due dates would require a more organized instructor, or that the assignment is considered for the students' benefit and not the teacher? Another consideration was that some online courses are self-directed and designed for the student to work at his or her individual pace.

Local area work experience was the only item to reach the required agreement for online laboratory type instruction. Miller (2008) stated that the delivery of science-based courses might be problematic as science courses offered face-to-face typically include laboratory components for hands on learning. Real life implementation of laboratory-learned techniques is put into action for everyday use. Not being able to visually and tangibly apply those techniques for practice can be considered detrimental to the learning process; however, structured laboratory-type settings may be considered impossible for distance education students. The basis for the development of courses being offered online is for people to have the opportunity to take college courses with little disruption in daily life, and giving the public access to education they would otherwise not receive based on geographical location, social status, and career (Miller 2008).

The panel unanimously disagreed with the statement that no laboratory component should be included in the course, yet had no agreement on how

that instructional component should be implemented. Some solutions may include requiring students who are not in a geographically convenient location to make self-directed field trips to local breeding operations; obliging the student to venture out to farms to observe and participate in practices that are currently implemented in breeding operations. This could also allow the students to ask questions and gain understanding of techniques. Methods implemented by Bing et al. (2011) determined that there was no significant difference in scores between students who were taught an anatomy lab through an online environment versus those who learned face-to-face. Laboratory sessions were taught through detailed video demonstrations via Blackboard Vista and Adobe Dreamweaver. Assignments and quizzes were given following the videos to assess the understanding of the videoed material. Successful formats such as these could be implemented in equine reproduction laboratory assignments.

Essays, short answer tests, and multiple choice examinations are the traditional means of assessing student performance (Kaye and Hawkridge, 2003). In this study, short answer and quizzes were the highest rated means of assessment. Considering this was a study employing professionals in higher education, the lack of support for a final examination and multiple examinations over the course of a semester for assessing student performance in an online equine reproduction course was unexpected. Biggs' (1999) study further proffered that examinations are the most common forms of assessing student learning. Respondents in this study were favorable toward these methods; however, 100% agreement of this practice was not achieved. As faculty move toward embracing other means of teaching, this result may indicate a realization that alternative methods must be developed as a means of authentic assessment for students studying, at a distance, to be active practitioners of equine reproduction.

On-line discussions failed to achieve consensus in the third round, implying that instructors believed this was a valuable tool, but were not necessarily sure about structure and assessment. One respondent added a comment in the second round: "It is difficult to set criteria for online discussions." Through online discussions, students are required to interact with peers regarding ideas and thoughts. This forced participation is an advantage for online environments as face-to-face classes may allow some students to sit quietly, while others dominate discussion topics.

Discussions require planning and criteria prepared before hand, ultimately putting more responsibility

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on the instructor. As distance delivery software is maturing, more programs exist to make such rubrics easier to develop. Software, such as Blackboard Vista, makes interaction between students more available with chat rooms and discussion boards. Workshops offered to instruct faculty in the use of such software is key in the success of online interaction (Miller, 2008).

Video assessments and essays were ranked the lowest of the assessment practices. This begs the query: Are these methods too time consuming for the instructor? The age of the participants ranged from 45- to more than 65-years-old, indicating that these instructors may be well-practiced in chosen methods and unwilling to change teaching format. Half of the expert panel of this study had 50% research appointments, which may limit the time and effort necessitated for assessing online class involvement.

Many of the suggested teaching and assessment practices are reflective of materials and methods commonly used in a face-to-face teaching and learning environment. Several other innovative methods, such as structured groups, social media (Twitter chats), and virtual simulations (Second Life), among others, were omitted from inclusion by the panel of experts. While this may be reflective of the panelists' age, it may also result from a lack of awareness of and experience with alternative teaching methods for an online course. Networking with other professionals is critical for continued use, integration, and adaptation of any educational innovation (Hall and Hord, 1987). Teaching online courses is not exempt from that need for professional interaction.

Communities of practice are defined as "*groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly*" (Wenger et al., 2002, p. 4). Professional organizations such as the North American Colleges and Teachers of Agriculture (NACTA), and the American Association for Colleges of Teacher Education (AACTE) support the improvement of teaching at the collegiate level. Through directed communities of practice, support can be administered for college level educators. Developing programs and workshops may aid in increased understanding of methods to online instruction. Open Courseware is a program that increases the professional development between universities by sharing (Schmidt and Miller, 2005). Developed by MIT, Open Courseware allows for the sharing of information among universities for anyone who logs on to view it (Rappa, 2003). Schmidt and Miller (2005) explored the interest of universities in becoming involved in sharing information and

reported nearly 50% of participating administrators expressed interest; thus, making Open Courseware a possible link for making online instruction methods and courses more accessible.

Equine reproduction is a relatively new innovation with respect to online delivery. As offerings in this subject matter area increase, the pool of potential instructional experts will also grow. For further research, repetition of this study should be done involving a larger participant population.

Perhaps by broadening the topic studied from equine reproduction to equine science or all laboratory-based agricultural science courses, more insight may be gained. Studies across all agricultural disciplines involving a traditional laboratory component should be completed, targeting student and faculty satisfaction, as well as possible new methods of instruction.

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Introducing Library Research Databases to Agricultural Economics Students



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Abstract

A professor of agricultural economics and a member of the library faculty at Purdue University collaborated to improve the quality of students' research and references for a class project, which the agricultural economics professor had been assigning for several semesters. They designed a class lecture, which included an active learning exercise, to help students learn how to use library databases for research for the project. After the class lecture, students were surveyed to determine the effectiveness of the intervention, the change in their awareness of different reference materials, and the change in their usage of these references. The survey referenced in this article was deemed exempt by Purdue University Institutional Review Board. Results indicate that students significantly expanded their awareness and use of references for the course in question as well as other courses they were taking that semester, evidence of an increased level of information literacy.

Introduction

Beginning in 2009, a professor of agricultural economics and an assistant professor of library science at Purdue University collaborated to meet the challenge of improving the quality of students' research and references for a class project. For many semesters, the professor of agricultural economics had been incorporating a current issues project into an agribusiness marketing course. The course was a 400 level course drawing students who were agribusiness majors as well as other majors from the College of Agriculture. Students took this course during their junior or senior year. The major course project had the objective of increasing student understanding of current topics in the news and gaining direct experience applying theoretical concepts from the course to the

real world. To complete the project students were required to:

- Form self-selected teams of two or three students to research library databases, identify several issues and ultimately choose a current issue,
- Conduct research on this topic using sources from the library databases,
- Develop and prepare an oral presentation, including a dress rehearsal with the professor of the course, and
- Deliver the formal presentation to the class and lead a question and answer session with the class.

In past years, completed projects ranged from unacceptable to outstanding. However, the sources that students used to research their topics recently had been less reputable and less acceptable. The professor was especially vexed when several students relied on unsuitable videos from YouTube, a website for sharing and viewing videos. While YouTube can be a rich source of information for some needs, the videos that the students selected for this project did not have the qualities of credibility, authority, relevancy, and objectivity. The instructor recalled the visit of the head of the Management and Economics Library to the agricultural economics faculty meeting, where the contribution library faculty could make to courses through lectures on research strategies in subscription databases, was identified. As a result, the professor contacted the librarian and set up the collaboration that is described here.

Literature Review

Student needs for finding and using quality information have always been recognized as a staple by university faculty, and these needs have been a matter of study in library science for over 20 years (Weiler, 2005). Twenty-five years ago a research project for

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a college class included going to the library and digging into printed indexes, finding and photocopying relevant journal articles, and taking handwritten notes. Today’s professors, students, and librarians have access to desktop tools that rise above that drudgery, but the three groups have different expectations of these tools. While professors want students to present quality research that supports assertions they make in papers and presentations and to provide appropriate citations, they sometimes erroneously expect that students come to class having mastered these competencies (Mackey and Jacobson, 2005), or that students should learn the skills of research, referencing, and citing on their own (Gonzales, 2001). Students often overrate their abilities when it comes to finding information, especially on the Internet (Weiler, 2005). They expect to enter a word, phrase, or question into a search field, then follow through by using whatever the search engine has supplied. Librarians want to help frustrated undergraduate students who are told their references are unacceptable, and may expect that students can transfer Google skills to subscription databases.

Bellamy (1984) noted that while bibliographic guides were advancing as a result of technical innovations, faculty and students lacked computer expertise to effectively utilize electronic databases, and recommended courses to overcome this obstacle. This recommendation is supported by Dahlgren’s findings (1987) that students find more useful citations when they get help from a librarian, and by Mackey and Jacobson (2005) that teaching alliances with librarians give faculty an opportunity to update their own information literacy skills. According to Caspers and Lenn (2000) this kind of collaboration results in productive learning experiences. Mackey and Jacobson suggest that team teaching gives students “*the best opportunity to apply information literacy within the context of a specific discipline*” (2005, p. 141).

Method

A three-step process was used for the information literacy intervention: (1) introduce and demonstrate the library resources, (2) let the students perform preliminary research, and (3) evaluate their results. The librarian identified relevant library databases (Table 1) and designed the active learning lecture session. The class session was delivered by the librarian with assistance from the professor. Following the lecture, students completed the course project with their presentations spread over several weeks of the semester. Once all presentations were completed, students were asked to complete a written survey to

Table 1. Resources for Current News Research

Subscription Databases	Purdue Supplied Resources	Free Internet Sites
LexisNexis Academic Factiva Newspaper Source PressDisplay ABI/Inform Business Source Premier AGRICOLA EconLit	Course page for AgEc 426 OWL	AgEconSearch USDA Google News Bing News CNN.com Washington Post NPR

measure the impact of the lecture by evaluating the change in student knowledge of library resources as well as the change in usage of library resources for course work.

Designing the Class Lecture

The librarian and agricultural economics professor agreed that the students would benefit from a lecture designed to improve information literacy. A demonstration of both academic databases as well as free Internet sites that would provide acceptable resources for the project was needed. Since a demonstration showing how to find a scholarly article in a database, besides being deadly boring, serves little purpose beyond the immediate result, it was crucial to include an active learning activity that would help students get started on research for the assigned project. The benefits of active learning with respect to student learning and retention, are well documented in the literature. Bonwell (1999) found that students in rigorous disciplines such as agricultural economics benefit from active learning, enabling them to maintain focus. Felder and Brent (2008) note that when students are actively engaged they retain more and assignments have better results. The active learning component for this class was the opportunity for student teams to use computers to explore demonstrated resources and begin making decisions about the project.

Integrating Information Literacy

Purdue University Libraries has adopted an Information Literacy Program as an important building block of the library’s commitment to support information literacy as both an academic research skill and a lifelong learning skill. The Mission Statement states, in part, “*The Purdue University Libraries Information Literacy Program builds a foundation for discovery, learning, and engagement across the University and its broader communities,*” (Purdue University Libraries Information Literacy Program Mission Statement, 2010) The Information Literacy Program aims “*...to integrate information literacy concepts into the curriculum, and to develop skills and competencies in learners to identify, find, evaluate, and*

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ethically use information, enabling academic success” (Purdue University Libraries Information Literacy Curriculum, 2010). The Association of College & Research Libraries (ACRL) adopted performance indicators for the principles of information literacy in 2000 (Association of College and Research Libraries), and standards three and four of those principles apply to the needs of this project:

Competency Standard Three: The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Competency Standard Four: The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

Teaching to the Project

Pedagogical options for the class were selected with the focus on information literacy. For example, since the assignment builds on a current issue in the news, selected subscription databases and free resources had to be strong news sources with an emphasis on authority and reliability. Structurally, the traditional guest-lecture, beginning-of-semester general demonstration of library resources (referred to as a “one-shot” by academic librarians) is often subject-specific but seldom project specific. Occasionally allotted just a fraction of a class period, the one-shot is insufficient to fully support information literacy and serves as a just-in-case demonstration. As pointed out by Anderson and May (2010), these sessions are inadequate to gain ACRL-identified information literacy skills. This agricultural economics class project was a definitive example of student need for just-in-time research help, so an entire 75-minute class session was allotted to the instruction. Content-wise, active learning and team teaching are proven approaches for introducing electronic resources (Maddux and McKenna, 1998) and so were incorporated into the plan.

The lesson plan for the session began with the basics:

1. Introduction to the Management and Economics Library and its web site, including options for getting research assistance.

2. Presentation of the online course page (created with LibGuide software) with links to selected resources, guides for evaluation of sources, and citation aides.

3. Discussion of the types of hard copy and electronic documents that could be used to research the project, and the need that sources be authoritative, accurate, credible, and timely.

Beginning a project is one of the top frustrations of a research project for many students (Head and Eisenberg, 2009). Therefore, time for students to start selecting potential topics for the project was deliberately incorporated into the class session. Specific strategies were introduced, such as choosing a subject that was already interesting to them, or checking out a website dedicated to agricultural economics (e.g., USDA News) to see what was featured. To encourage brainstorming, collaboration, and exploration, each team was given a flipchart sheet and directed to come up with a list of five or six possible topics to display and share with the class. Each team of students had access to the Internet. After the brainstorming session, there was a class discussion led by the course instructor of similarities and differences in chosen topics. The instructor evaluated each topic, identifying how the topics could or could not work in the context of the course project, with specific evaluation of the marketing connection.

After discussion and evaluation of the topics, students had the remainder of the 75-minute class time to search for research articles and other credible sources that would support one or two of their chosen topics. Students were encouraged to explore demonstrated websites and databases linked in the online course page to find quality sources that would support their topics. In particular, students were reminded of evaluation strategies for Internet searching such as looking for reliable .edu or .gov sites.

The college course described here was an agribusiness marketing course and not an information literacy course where there would have been a complete examination of all the principles of evaluating information. During the presentation in the class lecture there was a brief overview of the essential aspects of depth and breadth, bias and perspective, quality of publication, purpose of the information, date and level of information. Other essential aspects, such as plagiarism and requirements for correct citation, were taught by the agricultural economics professor at another point in the course.

Results and Evaluation

As noted previously, student responses to a written survey were used to evaluate the impact of the lecture to promote information literacy. The survey, developed by the professor and librarian, was four pages and consisted of ten questions, a copy of which is in Table 2. The survey was distributed to two classes, one in Spring 2010 and one in Spring 2011, and was completed by those students who attended class on the day the survey was distributed. The hard copy surveys

Table 2. Student Survey on Using Library Resources

Survey
AgEcon 426

These questions refer to the special class session and demonstration of library resources that was held on the afternoon of Tuesday March 22.

In order to participate in this survey, you must be 18 or older.

Participation is voluntary and you are not obligated to answer all questions.

1) Please indicate which of the following resources you were aware of before the library instruction session. Check Aware or Not Aware:

Resource	Aware	Not Aware
Library subscription database LexisNexis Academic	_____	_____
Library subscription database Factiva	_____	_____
Library subscription database Newspaper Source	_____	_____
Library subscription database PressDisplay	_____	_____
Library subscription database ABI/Inform	_____	_____
Library subscription database Business Source Premier	_____	_____
Library subscription database AGRICOLA	_____	_____
Course page for AgEc 426	_____	_____
Purdue's Online Writing Lab (OWL)	_____	_____
Career Wiki	_____	_____
Free resource AgEconSearch	_____	_____
Free resource USDA	_____	_____
Free resource Google News	_____	_____
Free resource Bing News	_____	_____
Free resource CNN.com	_____	_____
Free resource Washington Post	_____	_____
Free resource NPR	_____	_____

2) Please indicate which of the following resources you have used for the AgEcon 426 Current Issues project. Check Used or Have not used.

Resource	Used	Have not used
Library subscription database LexisNexis Academic	_____	_____
Library subscription database Factiva	_____	_____
Library subscription database Newspaper Source	_____	_____
Library subscription database PressDisplay	_____	_____
Library subscription database ABI/Inform	_____	_____
Library subscription database Business Source Premier	_____	_____
Library subscription database AGRICOLA	_____	_____
Course page for AgEc 426	_____	_____
Purdue's Online Writing Lab (OWL)	_____	_____
Career Wiki	_____	_____
Free resource AgEconSearch	_____	_____
Free resource USDA	_____	_____
Free resource Google News	_____	_____
Free resource Bing News	_____	_____
Free resource CNN.com	_____	_____
Free resource Washington Post	_____	_____
Free resource NPR	_____	_____

3) Please indicate which of the following resources you have used for other projects. Include both class projects/assignments and personal projects:

Resource	Used	Have not used
Library subscription database LexisNexis Academic	_____	_____
Library subscription database Factiva	_____	_____
Library subscription database Newspaper Source	_____	_____
Library subscription database PressDisplay	_____	_____
Library subscription database ABI/Inform	_____	_____
Library subscription database Business Source Premier	_____	_____
Library subscription database AGRICOLA	_____	_____
Course page for AgEc 426	_____	_____
Purdue's Online Writing Lab (OWL)	_____	_____
Career Wiki	_____	_____
Free resource AgEconSearch	_____	_____
Free resource USDA	_____	_____
Free resource Google News	_____	_____
Free resource Bing News	_____	_____
Free resource CNN.com	_____	_____
Free resource Washington Post	_____	_____
Free resource NPR	_____	_____

were handed out to students at the start of a class period so they had ample time to complete all parts of the survey. During the introduction of the survey, students were informed that participation was voluntary and if they elected to complete the survey, all results would be confidential since the completed surveys were returned anonymously. A total of 97 students enrolled in these two classes, and 72 students filled out the optional survey. The data from the two years were pooled together and analysis proceeded with the data from the two classes. The data were entered into a spreadsheet to facilitate the creation of figures and statistics reported in this paper.

Students completed the survey to identify their level of awareness of various resources prior to instruction, their awareness after instruction, and their usage of the resources for the marketing class as well as for other classes. If the focus of this course had been information literacy, the faculty would have conducted a pre-test to determine student information literacy skills at the beginning of the semester and then a post-test to determine improvement. The course was agribusiness marketing management, with this intervention one part of a broader course. Given the time and resources available it was necessary to rely on student self-reporting to measure change in awareness and change in behavior.

Students' responses to the question of which resources they were aware prior to instruction by the librarian, are presented in Figure 1. In general, the students' awareness of the subscription databases accessible through the Purdue Library system and available to Purdue students, faculty, and staff, was low with less than one-third of students indicating awareness. It is interesting to note that only about one-quarter of the students were aware of AGRICOLA (a subscription database of material on agriculture in the National Agricultural Library) prior to the lecture, in spite of the fact that the course is a 400-level agricultural economics course. Their awareness of EconLit (a subscription database of economics literature) was slightly higher, but still fewer than one-third of students reported awareness of it. Again, this seems low for a 400-level agricultural economics course. Another surprising result was the low level of awareness of ABI/Inform (a subscription general research

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(Table 2 Continue)

4) Consider the AGECE 426 Current Issues Project involving the identification and research of a current issue in the news. How beneficial was the session in the computer lab in the undergraduate library in your ability to complete the project and earn a good grade on the project? (Please circle one)

Not beneficial 1 2 3 4 5 Very beneficial

5) If you are unable to find the information required for a project, which of the following would you do?

Ask my professor for help _____ yes _____ no _____ not sure

Go to the reference/help desk in the library _____ yes _____ no _____ not sure

Contact a librarian for an appointment to get assistance _____ yes _____ no _____ not sure

Use the IM service on the library home page _____ yes _____ no _____ not sure

Use the link on the library home page to send an email to library staff _____ yes _____ no _____ not sure

Ask a fellow student for help _____ yes _____ no _____ not sure

6) If you are graduating and intend to enter the workforce, will awareness of these types of subscription databases and free web resources influence how you will look for information in your work setting? _____ yes _____ no _____ not sure

7) If you are not graduating at this time but continuing your education, will awareness of these types of subscription databases and free web resources influence how you will look for information for other classes? _____ yes _____ no _____ not sure

8) Will awareness of these types of subscription databases and free web resources influence how you look for information for personal reasons? _____ yes _____ no _____ not sure

9) Are you _____ Male _____ Female

10) What is your current GPA? _____ <2.5 _____ 2.5-3.0 _____ 3.0-3.5 _____ > 3.5

Thank you!

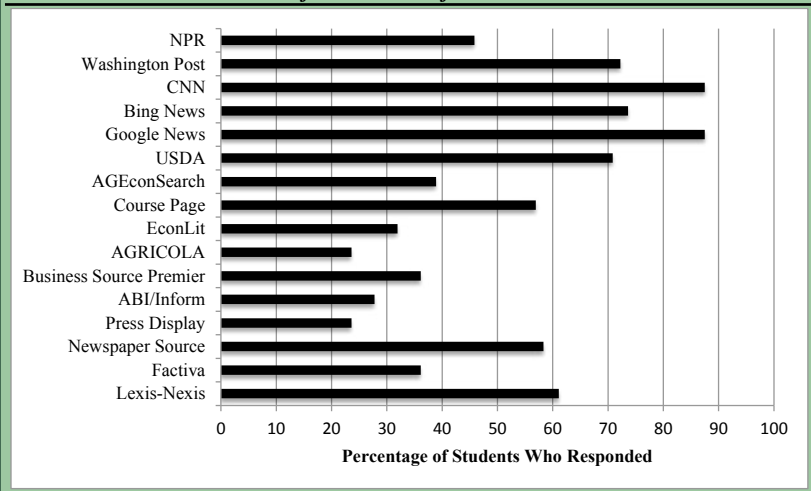
database) in spite of the fact that library faculty promote it in every management, business, and economics class that they visit starting at the freshman level.

CNN and Google News were the resources of which students were most aware prior to instruction with almost 90% of students indicating awareness. Awareness of USDA was also strong at just over 70%. It is noteworthy that over one-half of the students indicated they were aware of the course web page

prior to instruction, yet that web page was set up specifically for the class and first introduced during the intervention. This result provides evidence that the concerted effort by librarians to promote information literacy through guest presentations in courses and setting up course pages across campus is increasing student awareness.

Students were also asked to identify resources they used during the semester both for the marketing course as well as for other courses (Figures 2 and 3). Despite low levels of awareness at the start, students responded to instruction and made use of the resources. In Figures 2 and 3 the solid lines represent the percentage of students who were unaware of the resource prior to instruction and then used the resource, while the hatched bars identify the percentage of students who were aware of the resource prior to instruction and used that resource. Every resource was used by at least one student for the marketing class as well as for other classes. The sources used most often were Google, followed by USDA and CNN. The course page was used for the marketing class project by almost 60% of responding students (20% who had been unaware and almost 40% who had been aware), once again showing the value of librarians in promoting information literacy. Another surprising finding is that although searching the databases LexisNexis and Factiva is not intuitive, there was high usage of these databases. Over 50% of surveyed students reported using LexisNexis and nearly 40% reported using Factiva for the marketing course, while 66% of the surveyed students reported using LexisNexis and 38% reported using Factiva for other courses.

Figure 1. Percentage of Responding Students Who Were Aware of Resources Before Instruction



Discussion and Conclusions

Although not all students responded that the session was helpful, they all did report using the resources that were demonstrated. Many of the students tried at least one of the subscription databases that were new to them. The original objective of the special class lecture was achieved: namely, to improve the quality of the resources students used for the current issues project.

Partnership with library faculty was extremely beneficial in efforts to improve student performance from a research and content perspective. Faculty cannot assume that students come to the classroom with

Figure 2. Percentage of Responding Students Who Used Each Resource for the Current Class

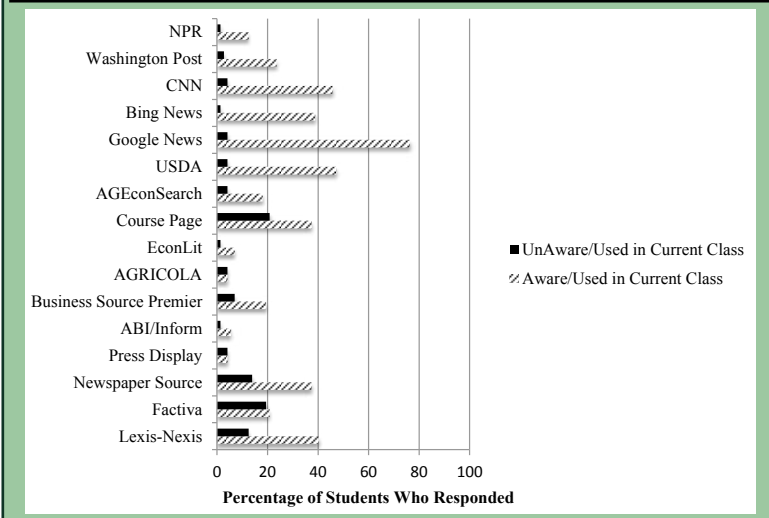
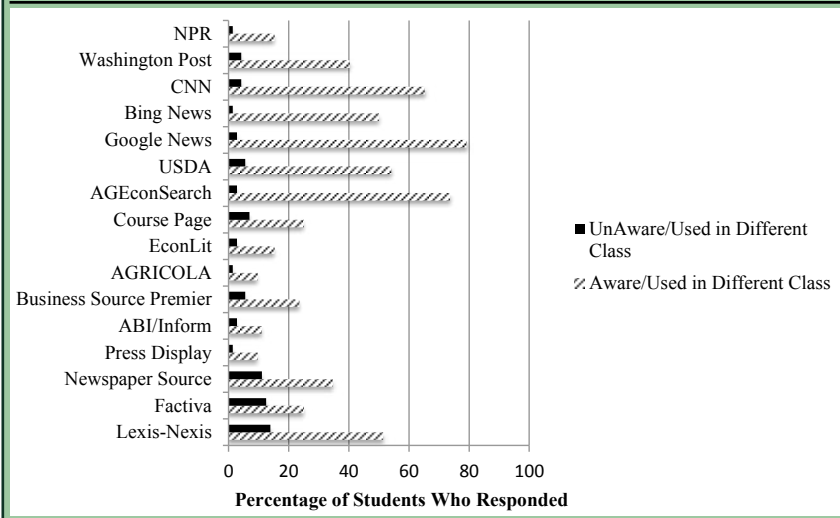


Figure 3. Percentage of Responding Students Who Used Each Resource for Another Class



effective information literacy skills. From the results presented here we have evidence that it was possible to improve information literacy skills. It was possible to change student behavior and direct them to sources that were rigorous and authoritative.

The agricultural economics professor and librarian are planning to continue their partnership. They will continue to include the student favored subscription databases, LexisNexis, Factiva, and NewspaperSource, as well as the chosen internet sources, USDA, Google News, and CNN, but overall the list of demonstrated or recommended resources will be reduced. Limiting the number of options will help students focus on discovering rather than exploring, and will free more time for discussion of evaluating information and applying critical thinking skills to the project. It is especially important to foster the perceptive evaluation of Internet sources, and this will be emphasized in future classes.

The final outcome was that through faculty-librarian relationship building, students improve their information literacy skills, achieve more comprehensive research analysis, and improve presentation skills. They developed research skills that would be beneficial in aspects of their life outside of the classroom, especially as they enter the workforce.

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The Implications of Frequency and Correlation in FFA Career Development Events in Texas¹



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Abstract

As the National FFA Organization continues to grow in membership, the quality of Career Development Events becomes critical. This study uses Pearson product-moment correlation coefficient and frequency measures to evaluate the event quality in the Farm Business Management competition. Poor quality questions use in the competition are identified based on frequency distribution and r values. These questions possess flaws and need to be reviewed or eliminated to improve test quality. This will increase the level of fairness and difficulty of FFA events in the future. However, the ultimate beneficiaries are the students, who will gain the most from improvements.

Key Words: Pearson product-moment correlation coefficient, r value, frequency, FFA, Career Development Event, Farm Business Management

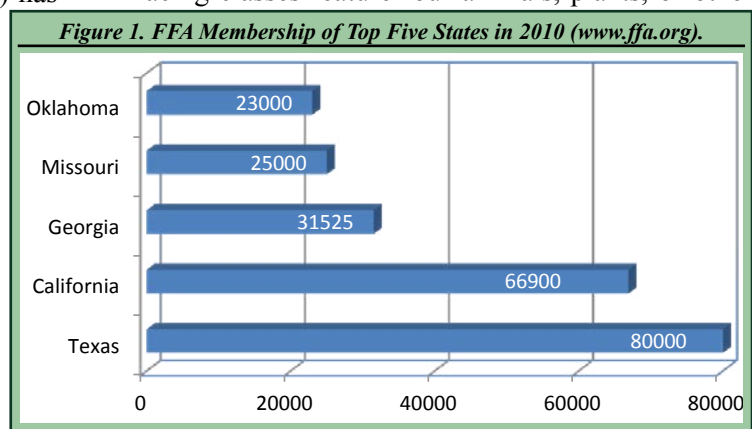
Introduction FFA and FFA Events

Founded in 1928 to promote and support agricultural education, the Future Farmers of America (FFA) has benefitted millions of students over the years. Now known as the National FFA Organization, it has grown to become the largest student-led organization in the world, paving the road to “premier leadership, personal growth, and career success” (National FFA Organization, 2010). In 2010, FFA membership across the country totaled 523,309 (National FFA Organization, 2011), which continues the trend of increasing annual membership. The Texas FFA Association, founded in 1930, now has membership totaling over 80,000 students, which sets the record for

the highest membership total ever in the State (Texas FFA Association, 2011). As shown in Figure 1, with 15.3% of the National membership Texas contributes the most students of any state, with California ranking second.

FFA consists of several pillar components. One of the components is Career Development Events, or CDE’s, also known as judging contests. CDE’s combine classroom activities with hands-on experience, serving as a valuable educational tool. Tens of thousands of students in Texas participate in these various events annually.

In order to fully comprehend this study, it is necessary to understand how Career Development Events work. All CDE’s follow the same general format. Every contest uses a standard Scantron designated for the event, which makes grading much easier and provides a tool to gather data. Consistent with National CDE rules, events usually consist of placing classes, some form of grading, identification, and a written exam (National FFA Organization, 2011). Placing classes feature four animals, plants, or other



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subjects which students evaluate and compare based on judging rules presented by their coaches, usually their school's agri-science teachers. The contestants then rank the subjects by their assigned number in order from best to worst. For example, a steer class in Livestock Judging in which the 3 steer is the best, followed by 1, then 4, with 2 being the worst would be placed 3-1-4-2. The student would bubble the class as such on the proper area on the Scantron. Any mistake results in a loss of some points, based on the margin of error and the judges' cuts for the class, which are adjusted according to difficulty.

In the grading section of an event, participants must evaluate the subject against a standard, such as Low Prime beef in Meats Judging or a Grade A egg in Poultry Judging. Any deviations from the official key will result in a loss of points, depending on the size of the error in most events. The written exam portion consists of a test containing questions pulled from a question bank prepared and approved by the Texas FFA. However, these exams require more skills than simply memorizing an answer. It is given to students by coaches to study prior to the contest. Some events include other sections which are specific to their content, but nearly all contests have these three sections in common.

In most contests, the agri-science teacher of a high school team selects four members to represent the chapter. All four members in the team compete. However, in most events only the top three individual scores of the team members combine to constitute the total team score. Teams compete at two different types of events: invitationals and advancing meets. Invitationals are essentially warm-ups for advancing meets, but do award banners and other prizes to the top individuals and teams. Hosted by colleges or high schools, invitationals follow the same general rules but do not have as much at stake. Dozens of invitational events are held during the spring semester throughout Texas, making it virtually impossible for any high school or team to compete at all of them. The number of invitationals at which a school competes depends on the competitiveness of the Chapter and their proximity to the contest site.

Advancing meets are organized on the Area, State, and National levels. Area events are held separately at designated universities based on the location of each of the ten geographic Areas. According to Texas FFA rules, anywhere from three to ten of the top placing teams from each Area, depending on the participation level and rules of the event, move on to compete at the State event (Texas FFA Association, 2011). State events are held at specified universities, and they determine

the best team in the entire state. In most events, only the first place team at the State contest advances to represent the state at the National competition, which over the past few years has been held in Indianapolis, Indiana, in October.

At each successive level of competition, participants intensely prepare and practice, vying for first place. Often, the difference between advancing to the next event and going home is only a handful out of the hundreds of possible team points. With such a long and difficult road to earn the honor of representing the state of Texas in the National event, it is imperative that all contests held in Texas, both invitationals and advancing events, are fair and ensure a degree of difficulty which will challenge students and allow the best individuals and teams to rise to the top. However, determining the degree of fairness and challenge in an event has historically been mostly a matter of opinion of participants and coaches with no supporting data. More in-depth analysis is required than simply looking at the schools and scores at face value. It is the collecting of data by section or question and then analyzing it that can truly reveal the quality of an event.

PPMCC Background and Literature

This study utilized the Pearson Product-Moment Correlation Coefficient, (PPMCC or r), a statistics measure which determines the strength of the correlation, or linear dependence, between two variables to evaluate the quality of contest questions. This concept was first introduced in the 1880s by Francis Galton, but was later developed and studied by Karl Pearson (Rodgers and Nicewander, 1988). Though the PPMCC can also be used to test a null hypothesis, for the purposes of this study it will generally be used to construct a confidence interval. Data from Judging Card, a website which stores event data from hundreds of FFA contests across the United States, will be analyzed using this method (JudgingCard, 2011).

Rodgers and Nicewander (1988) examined several applications of the PPMCC and r value. They showed that "Pearson's r (or simple functions of r) may variously be thought of as a special type of mean" among other things, and "may be looked at from several other interesting perspectives" (Rodgers and Nicewander, 1988, p. 61). Their work analyzed r values as a mean, slope, or function of angles with numerous applications. This work showed that a "wealth of additional fascinating and useful portrayals" of the r value is available because of the "diversity of interpretations" which was accessible (p. 62). Not only was the measure accurate and advantageous, it also

has remained true through the years of its century-old existence. The paper concluded that: “*the correlation has developed into a broad and conceptually diverse index... [yet] it is remarkably unaffected by the passage of time* (p. 64).”

Many books and articles (Ary et al., 2010; Cohen, 1988, 1992; Cohen et al., 2007; Gravetter and Wallnau, 2008; Pagano, 2007; Welkowitz et al., 2006) described uses of the PPMCC specifically in behavioral sciences and education. Some studies used this method to correlate grade point average with attendance, while others related factors such as gender and income bracket to academic competence. Most books referenced in this study observed that r values for social sciences are usually lower than those of disciplines such as physics. Cohen et al. (2007) stated that “*perfect correlations of +1.00 or -1.00 are rarely found and...most coefficients of correlation in social research are around +0.50 or less* (p. 531).”

PPMCC Related to FFA Events

When assessing test quality, requirements for what constitutes a less effective question must be set. In order for a test to best combine fairness and difficulty, questions must be hard enough so that not every participant is able to answer it correctly. At the same time, they must not be overly challenging, with only a handful of students arriving at the right answer. This reduces the exam to a guessing game, rewarding the lucky instead of the talented. A combination of these guidelines must be used when analyzing the tests.

Another ideal statistic which judges and test writers seek is higher positive r values for correct answers. This implies that a given student’s correctly answering a question strongly correlated to that student having a higher overall score than those who missed it. Such a property is attributed to questions that are sufficient in difficulty and fairness. Conversely, negative correlation coefficients for right responses expose a flaw, either on the part of officials or contestants. These questions must be evaluated, improved, or even eliminated in order to ensure contests of utmost quality, which combine fairness and complexity to the highest degree.

Objectives

The primary objective of this study is to apply frequency and correlation methods to FFA data in order to identify portions of contests which could be improved. Findings will aid judges and officials of events in understanding how to enhance contests by constructing a more fair and competitive event.

Furthermore, the methods used in this study will allow the evaluation of the quality of an FFA contest using mathematical and statistical principles rather than opinion.

Methods And Procedures

PPMCC

By rule, the PPMCC requires two variables to perform the analysis, X and Y. With respect to the Farm Business Management contest in this study, the X variable is the number students selecting a given answer choice, and the Y variable is the contestant’s total score for the event. With two variables, the PPMCC can be defined as the covariance of these variables divided by the product of their respective standard deviations. This is shown mathematically by the following formula:

$$\rho_{X,Y} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y} = \frac{E[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y} \quad (1)$$

The Greek letter rho (ρ) above represents the correlation coefficient for a population. When using sample statistics, the following formula gives the r value, which denotes a sample correlation coefficient:

$$r = \frac{\sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^n (X_i - \bar{X})^2} \sqrt{\sum_{i=1}^n (Y_i - \bar{Y})^2}} \quad (2)$$

A similar equation finds the correlation coefficient as the mean of the products of the standard scores. Centered on (X_i, Y_i) , a sample of paired data, the PPMCC of a sample can be found:

$$r = \frac{1}{n-1} \sum_{i=1}^n \left(\frac{X_i - \bar{X}}{s_X} \right) \left(\frac{Y_i - \bar{Y}}{s_Y} \right) \quad (3)$$

where, $\frac{X_i - \bar{X}}{s_X}$ is the standard score, \bar{X} is the sample mean, and s_X is the sample standard deviation.

By definition, the PPMCC yields an r between -1 and +1 inclusive, with a value of zero implying that no linear correlation exists between the two variables, X and Y. An r of +1 indicates that two variables are described perfectly by a linear equation, meaning that Y increases as X increases for all data points. Conversely, an r of -1 implies that Y decreases as X increases for all data points. Though guidelines do exist for interpreting a correlation coefficient, these are not set rules which must be followed in all situations. The relative strength of a correlation coefficient, such as whether a given number is high or low, rests on the purposes of the analysis and the context in which the PPMCC is being applied. For instance, an r of .82 may be very low when analyzing scientific law, but may

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be very high when considering subjects such as social sciences which are much more vulnerable to outside complicating factors. Thus, the range and strength of correlation coefficients are highly specific to the material and nature of the data at hand.

Data

This study will focus on the Farm Business Management CDE, which consists solely of a written exam. Points are awarded for correct responses, but none are given for incorrect answers. The contests in review are the 2011 Tarleton State University (Tarleton) Invitational event with 137 contestants and the 2011 Area IV and VIII competition with 92 contestants, also hosted by Tarleton. Each of these tests contains an economics concepts (Economics) section with 50 questions worth two points each as well as an economics problem-solving (Math) section with 30 questions worth five points apiece. The PPMCC is applied to each answer choice for every question. The frequency of each answer choice, or how many contestants selected it, is recorded. As with most statistical principles, a higher frequency results in a more accurate measurement, in this case correlation. Thus, a higher frequency will yield a correlation coefficient which more accurately represents sample data and possesses a greater degree of reliability. By utilizing frequency and correlation principles, data from these events can be analyzed to appropriately evaluate quality.

Methods and Procedures

Each PPMCC value must be either positive or negative. Positive r values indicate that Y increases as X increases, or Y decreases as X decreases. On the contrary, negative PPMCC numbers denote that the Y variable increases as X decreases. Applied to this study, a positive correlation coefficient conveys that students who selected a given answer choice tended to score higher on the overall contest than those who selected an answer with a negative r value. Conversely, negative coefficients imply that a given response tended to correlate with a lower total score.

As previously stated, the relative strength of r depends on the type of data collected, particularly the degree of vulnerability to outside factors. As in previous research in education, this study used conservative coefficient ranges. More specifically, this paper utilizes the range formulated by J. Cohen (1992), which sets r values of small, medium, and large as .10, .30, and .50 respectively. With the Farm Business Management CDE as the contest of focus, the range categories for the PPMCC are shown in Table

1. As a result of these divisions, seven correlation coefficient categories exist: No Correlation (NC), Small Positive (SP), Medium Positive (MP), Large Positive (LP), Small Negative (SN), Medium Negative (MN), and Large Negative (LN). Table 1 summarizes these categories. These categories will be referenced throughout the study. The greater the absolute value, or distance from zero, the stronger the correlation is between X and Y . For example, an answer choice with a coefficient of 0.72 statistically tended to lead to a higher overall score more often than an answer choice with a 0.13 coefficient.

Correlation	Positive	Negative
No Correlation	0.00 – 0.09	-0.09 – 0.00
Small	0.10 – 0.30	-0.30 – -0.10
Medium	0.31 – 0.50	-0.50 – -0.31
Large	0.51 – 1.00	-1.00 – -0.50

For the purpose of this study, these limits have been established mathematically based on the frequency of each answer choice. A given question was deemed less effective if more than 85% of the total number of participants answers correctly or less than 10% select the right answer choice. These limits were decided after consulting various writers of Texas FBM exams. The number of students at the Tarleton Invitational contest totaled 137, making the boundaries for a less effective question 116 and above on the high end and 14 and below on the low end. For the Area event, which had 92 total contestants, the limits will be a ceiling of 77 and above with a floor of nine and below. These frequency limits were used for both the Economics and Math sections of each test.

In addition to frequency, the sign and strength of the correlation coefficient were also used in the identification of less effective questions. For both sections of the Farm Business Management event, questions which have at least one wrong answer choice with a coefficient in the Small Positive r category or greater (SP, MP, LP) were considered less effective. The goal of test writing should be for a correct answer to a given question to correlate with a higher overall score. Therefore, incorrect choices should correlate with lower overall scores.

When focusing on the Economics section, correct answer choices with an r value in the No Correlation (NC) category or any of the negative categories (SN, MN, LN) were also marked as poor quality. Correct responses should correlate with an improved total score, which is indicated by the positive coefficient categories (SP, MP, LP). On the Math section, less effective questions were those which possessed

correct answer choices with coefficients in the Small Positive (SP), No Correlation (NC), or any of the negative correlation categories (SN, MN, LN). Small Positive (SP) is included in this section because the correlation between a correct response and a higher overall score should be stronger than in the Economics section. This is because questions in the Math section are worth as many points as 2.5 questions in the Economics section. Therefore, a single Math question has more impact on the total score than a single Economics question, which should be shown by a stronger correlation and higher r value.

During the analysis of each test, researchers looked for two general types of questions that are significant to the study. Questions of poor quality were marked according to the guidelines for frequency and r values outlined above. Those with a frequency which is too high or too low were noted, as well as answer choices that do not have appropriate r values. Additionally, questions of high quality were pointed out. Such questions were identified first by assessing the frequency of each answer choice. Frequency should be within designated limits, which is an indication of a well-written question. Furthermore, the correlation coefficients of each answer choice should be higher than average, which shows that the question had a higher than usual impact on a given contestant's total score. The inclusion of several questions of this caliber will boost the overall quality of the exam, as these tend to be more challenging, and will improve the degree of difficulty for the contest.

Generally speaking, when evaluating scores after a Farm Business Management event, or any contest, officials desire to find more questions which convey fair competition and an adequate degree of complexity. Test writers are striving for more high quality, meaningful questions than ones that did not contribute any positives to the exam. To improve questions, writers can restructure questions to increase clarity, include more detail and select answer choices more carefully. These actions can raise test takers' comprehension of questions without sacrificing any degree of difficulty.

Results

After evaluating each test and analyzing the frequency and correlation strength for each answer choice, several interesting observations were made, as seen in Table 3. In the Economics section of the Invitational exam, eight questions did not meet frequency requirements, with seven having too high a frequency and only one possessing a frequency

Table 2. Frequency and r value Characteristics of Less Effective Questions

Section	Frequency		r value	
	Too High	Too Low	Correct Answer	Incorrect Answer
Economics	X > 85%	X < 10%	NC, SM, MN, LN	SP, MP, LP
Math	X > 85%	X < 10%	SP, NC, SM, MN, LN	SP, MP, LP

Table 3. Evaluation of Less Effective Questions on the 2011 Tarleton Invitational

Section	Requirement not Met			
	Frequency		r value	
	Too High	Too Low	Correct Answer	Incorrect Answer
Economics	1, 20, 22, 25, 33, 44, 46	11	5, 9, 25, 28, 31, 39	23, 38
Math	2	None	1, 19, 29	29

under the specified level. An example of a frequency which was too high is Question 1, as 122 of the 137 contestants picked choice D, exceeding the limit of acceptability of 116. The question with not enough students answering correctly was number 11, with only eight of 137 participants being right, not meeting the minimum of 14.

Additionally, eight other questions fell short of the requirements for correlation coefficient strength. Of these, six were correct answer choices which did not have a high enough r value, while two were wrong selections with positive r values. Both of these indicate questions of poor quality. One correct selection whose correlation was too weak was number 9 answer choice C which had a frequency of 94 but an r value of just 0.0830, falling into the No Correlation category. An instance of a wrong choice with a positive correlation coefficient was 38 B, whose frequency is 67 and r value was 0.1108. Such characteristics reveal low quality.

Six questions from this same section stood out because of high quality, combining an appropriate frequency distribution with stronger correlation coefficients. One of these good questions was number 8, with frequencies of 46, 60, 17, and 14 and respective r values of -0.1794 (SN), 0.4686 (MP), -0.2936 (SN), and -0.1682 (SN). Another high quality question was 48, whose frequencies and correlation coefficients were similar to 8. Each of these types of questions challenged participants and contributed more to the event, as reflected by stronger correlation coefficients.

The Math portion of the 2011 Tarleton Invitational test was also examined by using much of the same criteria. Only one question failed to meet the established requirements for frequency. Number 2 had 121 participants answer correctly, exceeding the acceptable maximum of 116. This section also possessed less questions marked as low quality due to r value flaws than the Economics section. Three questions on this

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portion of the exam had correct answer choices with negative or No Correlation, which is not desired. As seen above, this section also included seven questions which were of great importance to the outcome of the exam, indicating a well-designed section. One instance was question 4, which had answer choice frequencies of 1, 72, 16, 27, and 21 coupled with respective r values of -0.2309 (SN), 0.6268 (LP), -0.3262 (MN), -0.3008 (MN) and -0.1913 (SN). Simply stated, the correlation coefficients were stronger than average with a relatively good frequency distribution. Another such question was 28, which had similar superior properties.

When looking at the data from the 2011 Tarleton Area competition, several qualities common to both tests were discovered. The Economics section of this test contained three questions that exceeded the upper frequency limit. One such question was number 2, with its correct answer choice having a frequency of 78 out of 92 total contestants, narrowly exceeding the maximum of 77. An additional instance was number 45, with the right selection being chosen 82 times. As shown below, this test had no questions with a frequency below the acceptable minimum.

When considering correlation, this portion of the test contained four correct answer choices with an r value in the No Correlation or negative categories. Question 3 had a frequency of 72 and an r value of -0.0760 (NC) for its right response, while the correct selection for number 38 possessed a frequency of 38 and a correlation coefficient of -0.0291 (NC). This indicates that these questions have some sort of flaw and can be improved. In addition to these, three other questions possessed wrong answer choices with positive r values. Question 5 had frequencies of 44, 10, 15, and 23 while having respective r values of 0.1130 (SP), -0.4073 (MN), 0.3276 (MP), and -0.1171 (SN). This question is of particular interest because, judging by the given data, the 15 participants who answered incorrectly by selecting C tended to score higher on the overall contest than the 44 students who correctly chose A. These data strongly suggests that this question must be reviewed or eliminated.

Following a thorough examination of the Economics section of the 2011 Tarleton Area test, eight questions stood out because of high quality. Question 4 combined frequencies of 59, 3, 12, 17, and 1 with respective r values of 0.5610 (LP), -0.1826 (SN), -0.1507 (SN), -0.4633 (MN), and -0.0587 (NC). The 59 participants who selected the right answer had a strong tendency to do well on the overall contest, while the 17 students who answered D had an almost as strong tendency to not perform well. Several other

questions, including numbers 6, 11, and 15 had the same characteristics.

The Math section of the test was written extremely well, as no questions out of the entire portion of the event were found to be flawed due to frequency or correlation coefficient discrepancies. Only questions which had a high positive impact on the exam were easily spotted when reviewing the data. Questions such as number 19, which had frequencies of 12, 56, 16, 4, and 4 with corresponding r values of -0.3570 (MN), 0.6758 (LP), -0.3113 (MN), -0.2101 (SN), and -0.2390 (SN), combine fairness and complexity to a high degree. One possible reason for this section having no frequency or correlation flaws is the inclusion of a fifth possible answer choice, E. This additional answer choice decreases the chance of a participant being able to guess correctly. An added answer choice also makes eliminating choices more difficult, which helps the talented rise to the top.

Several trends were found after analyzing the exams. A common theme, found solely on the Invitational test, was the repetitiveness of no answer choice being bubbled, resulting in a blank answer. On both the Economics and Math sections, every instance of a blank answer with the exception of number 50 on the Economics portion had an r value of -0.2309 (SN). It is possible that the same participant left the questions blank, which would yield the same correlation coefficient in every instance. Another potential explanation is that two or more participants had the same overall score but left different answers blank.

On both contests, the Math section received higher r values than the Economics section, regardless of frequency. A consistent, greater correlation coefficient conveys that a given question on the Math portion has more weight and is of more consequence to the overall score than a given question on the Economics section. This occurs because each question on the Math is worth 5 points, as opposed to a question on the Economics having a value of 2 points. Therefore, it can be inferred that a question worth more points will be of greater significance and impact to the total score, with higher corresponding r values. Another observation is that the number of poor quality questions was less for the Area test than for the Invitational. This finding suggests that student aptitude may affect test quality, as the Area exam is held later in the season than the Invitational and gives the contestants more time to practice and prepare for the contest. An increase in the capability and knowledge level of the students decreases the chances of finding errors on the part of students when assessing scores.

Conclusion and Discussion

Strategies and methods for applying the Pearson product-moment correlation coefficient (PPMCC) to FFA data shown in this study can aid officials and judges in analyzing and assessing their events. It can additionally be utilized to evaluate whether or not the contest was keyed correctly. Once problem areas are identified, actions can be taken to improve these areas in order to consistently host a high quality contest. This study has made finding less effective questions in the Farm Business Management CDE easier and can also be applied to other events, which will lead to contests which have a higher degree of both fairness and difficulty, accomplishing the original objective.

Findings and methods taken from this study are not strictly confined to FFA use, but may also be applied in other areas as well, most notably in the classroom. Educators in all fields can utilize the PPMCC as a way to strive for excellence and fairness in their exams. Correlation analysis can also relate other pertinent factors to overall grades, such as attendance, class participation, and amount of notes taken. Findings will help both students and educators understand what contributes to success in the classroom and adjust their actions accordingly.

Evaluation of tests and general classroom practices will keep educators sharp and will allow for more well-written questions on exams. Improved tests will ultimately benefit students, as higher overall quality leads to improved clarity, less confusion, and a better opportunity for prepared students to succeed. Methods in this study can be beneficial not only in FFA exams, but in all types of examination as well.

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Collaborative Marketing Case Studies for Horticulture



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Abstract

While common in business schools, the use of case studies are less common in horticulture curricula, especially for business-related topics. After graduation, most students will go to work in a business, but horticulture majors are often not as well prepared for business management as they are for the technical aspects of horticulture production. In the horticulture industry, collaboration among businesses without formation of a formal cooperative is atypical; thus, the collaboration of independent retail plant sellers in Western Michigan provided an excellent opportunity for the development of a horticultural marketing case study. Branding, especially among state industry groups, has become increasingly popular as a means to differentiate products and stimulate sales. Pricing products can also be challenging, and bundling products often purchased together may give a wholesaler a competitive and price advantage. Since case studies on non-cooperative collaboration, branding, and pricing were not available, three case studies were developed and are presented here for use in an upper-level horticulture course. Students enrolled in a senior-level elective course, Horticulture Marketing, have participated in these case study discussions since 2002. Suggestions for using this case study are also presented.

Introduction

In an effort to make higher education more relevant to the workplace, case-studies are one cooperative learning strategy used in the classroom (Bransford et al., 2000). They are useful in bridging classroom theory and real-world practice in that they allow students to explore alternative solutions and risks, practice analytical techniques, work in teams, make presentations, write reports, and exercise good judgment (Brennan, 2009; Dexter and Tucker, 2009; Burge and Troy, 2006). Using case studies in

the classroom also leads to improved learning and retention, enhances motivation to learn, provides a multidisciplinary systems perspective, and develops teamwork skills (Smith, 1999; Springer et al., 1999; Johnson et al., 2006).

While common in business schools, the use of case studies are less common in horticulture curricula, especially for business-related topics. Within the horticulture industry, collaboration outside formal cooperatives is unusual, thus the collaboration of independent retail plant sellers in Western Michigan provided an excellent opportunity for the development of a horticultural marketing case study. Plant branding has become more popular with an increase in the number of business, regional, and even national plant brands. Since existing case studies on these topics were not available, three case studies were developed from real-world observations and used in an upper-level horticulture marketing course. The objective of this paper is to provide these case studies for faculty teaching upper-level horticulture or agriculture classes with a business marketing component to use (Appendices 1, 2 and 3), as well as to describe classroom management techniques for using them.

Case Study Objectives

Upon completion of the multiple case studies, the students should:

- Gain experience in solving a problem faced by a group of horticultural businesses.
- Be able to use their newly learned marketing concepts, terminology, and skills to analyze alternative actions for the businesses.
- Find additional pertinent information to help make a decision about the direction of the business.
- Articulate and defend their choice with marketing concepts and supplemental information.

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- Be faced with real-world decision-making situations where choices with marketing activities and other resources need to be made, based on industry and market knowledge as well as marketing concepts.

Classroom Management

Implementing the Case Study. Students in the elective senior-level 3-credit horticulture marketing course are required to complete three case studies, which are presented here (Appendices 1, 2, and 3). For each case study, they are assigned to work in a group and as an individual and assume a different role for each case-study: present facts and critique solutions, present solutions, or write an individual response. Students are asked to read the case and problem/questions, gather outside and additional facts, consider what the real challenges are for the business, present a set of recommendations, and consider the strengths, weaknesses, and costs of alternative recommendations, and ultimately defend their decision or choice. To do this, students must use reading skills, analytical skills, informational research skills, teamwork skills, writing skills, and critical thinking skills. Rotating the roles each student plays as well as asking them to do some work within an assigned group helps to replicate skills needed in the business world.

Students are required to begin their preparation for participating in the case by reading the information on a website (<http://www.mhhe.com/business/management/thompson/11e/case.htm>), which describes why case studies are used, the objectives of case studies in the classroom, how to prepare for and participate in the classroom discussion, how to prepare a written analysis, as well as how to research companies and industries on the internet. The instructor devotes one class prior to assigning the case studies to the approach of the case studies, using the website as talking points. Some appropriate steps are reviewed: reading the case multiple times, identifying key questions or issues within the case, identifying missing or needed information then seeking that supplemental research or data to support a decision or direction, and prioritizing (with budgets, if needed) the solutions. The entire class is divided into three groups, assigned to simulate a business environment where employees lack free choice of with whom they will work.

The roles rotate among groups by case to give students an opportunity to focus on different skills for different case studies (Table 1). Role #1 asks students to orally present the factual information in the case, which must be presented within the 10 minute time frame allotted. Role #1 also requires students to identify which chal-

lenges or questions are most pressing by prioritizing the issues. The students with this role are also asked to critique the solutions presented by students in Role #2. Students in Role #2 are charged with developing a set of recommendations and presenting that set of recommendations and costs, along with any challenges they identify. Students in Role #2 are asked to use marketing terminology and concepts learned in the course as well as incorporate additional research or facts that help support their solution. This presentation is limited to 10 minutes also. Then, students with Role #1 are asked to meet separately (out in the hall) and discuss the recommendations they just heard. The next 10 minutes are an opportunity for students in Role #1 to refute or support the recommendations and evidence produced by students in Role #2. Students in Role #3 write an individual response or solution to the case study, which is submitted prior to the start of class. Students inside the classroom can also engage in an informal critiquing process with students in Role #3. The remaining time in the 50-minute class are spent in open discussion, including students with Role #3. Each part may take up to 10 minutes, but some parts often finish earlier than the 10 minute allotted time.

Roles #1 and #2 require both individual input and group work. Role #3 requires that the student work individually to respond to the case in writing as an individual effort. The student with Role #3 may collaborate in the group, but their recommendations and supporting information are to be presented in their own words. This structure enables discussion and sharing of resources, and potential discussion of possible solutions or outcomes, to give the students some intermittent feedback prior to submission of the case solution.

The instructor’s role during case study discussions is primarily to manage the time by making sure each group stays within their 10-minute allotment. The instructor takes notes on student performance and drafts questions to ask during the general discussion. S/he also may choose to answer questions as they arise. The instructor is virtually silent until the open

Table 1. Rotating roles of groups for each of three classroom case studies. The table is listed in order of classroom exercise

Group or Role Number	Role
3	Full written report that includes recommendations, costs, and associated challenges turned in at beginning of final case study oral presentations.
1	Group orally presents the facts of the case (10 minutes).
2	Group presents a set of recommendations (including costs) to solve the problem and associated challenges (10 minutes).
1	Orally critiques solutions presented by Group 2 (10 minutes to discuss in hallway their thoughts, 10 minutes to present to class).
1, 2, 3	Participate in final entire class discussion (10 minutes)

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discussion portion of the exercise, where s/he would then offer any new information on how the case was resolved.

Other suggestions. Writing good case studies is not trivial and crafting a response to the case takes practice. Few agriculture students have much/any exposure to the case study method prior to this. The lack of familiarity with how to approach a case study learning method was a key finding in the use of case studies in this class. Adequate preparation of all students, especially for the first case, dramatically improved the responses and the student's ability to defend his/her choices. Additionally, writing the individual response without the group effort or opportunity for discussion also produced highly variable results.

Class discussion is a critical step in the case analysis, as students become more aware of their recommendations and reasoning compared to their peers. Like the business climate, information to support conclusions is sparse and not easily found yet still critical to the success of an argument defending a choice. Encouraging group discussion prior to the presentation to the class further encouraged students to "test" their proposed solutions before a grade was assigned. This was especially true for students presenting the written solution.

Writing a response prior to class discussion prepares most students to more actively engage in discussion. It also requires the student to consider his/her choices relative to the assigned group and re-examine reasons for the choice. Perhaps more evidence is needed or a different perspective exposed in discussion. An alternative to only writing a response (Role #3) might be to have all students complete the written response and, two or three days before class, divide them into two groups for presenting facts and solutions. They should be prepared to work with their peers in the two roles in addition to having written their own response. If an instructor wanted to incorporate only one case, s/he might have all students complete a written response submitted prior to class discussion.

Some potential pitfalls to anticipate using these cases would be student unfamiliarity with the case study process and poor preparedness. Only with practice do students become familiar with a case study method. Few students come to upper-level horticulture courses with any case study experience. Devoting one class period to the process, not the case itself, has improved participation in all roles. Generally, working more closely with upper-level undergraduates during the first case helps to improve the level of preparedness. Explaining how and where to find additional information helps direct students to resources

that will improve the quality of their response. It also shows students that finding pertinent information specifically from the horticulture industry is challenging. Therefore, they must find related products and make the intellectual leap to apply findings to the case. Decisions or results of business decisions with similar situations, like perishable food products, can be helpful. Students who must write a case response are often better prepared to discuss the case in class. Visual aids (graphs or charts, images and text) improve the effectiveness of presentations, but selecting groups at the beginning of class would likely reduce the students' ability to create effective visual aids.

In the first year, the case studies did not include questions as often is typical in the business schools. It became clear, however, that many agriculture/horticulture students needed some additional direction in the case study itself. In subsequent years, the questions proved to help guide the students on what was important to think about in the case study. By the end of the third case study, students seem to have a better understanding of the case study method and needed less formal direction and more informal checking of progress.

Summary

Students seeking a career in horticulture will be faced with many other job responsibilities that have little to do with the plants themselves. Using case studies is one useful teaching technique that bridges classroom theory to real-world practice as it allows students to explore alternative solutions and risks, practice analytical techniques, work in teams, make presentations, write reports, and exercise good judgment (Brennan, 2009; Dexter and Tucker, 2009; Burge and Troy, 2006). Giving students a chance to enhance these skills may be important to their future success. With some planning and preparation the use of the case studies described in this article can be incorporated into any horticulture marketing module.

Appendix 1. Marketing Collaboration Case Study

Background. As traditional independent plant retailers (IR) perceived an increase in competition from non-traditional plant retailers, including mass-marketers, they saw a tremendous burst of advertising in the spring which gradually took business away. National Gardening Association (NGA) statistics showed that market share for IR's was eroding from approximately 35% in 2000 (Butterfield, 2000) to approximately 23% in 2007 (Butterfield, 2008). Indi-

vidually, the IRs considered activities that might help generate more business. Several IRs had separately reflected that it might be possible to work together in some capacity to respond to decreasing market share to the box store chains. They were not interested in forming a formal buying cooperative, but rather seeking creative and collaborative means of communicating with their customers.

Year 1. Fourteen IRs in Western Michigan met in Grand Rapids at the Michigan State University Extension (MSUE) office in Kent County. The purpose of the meeting was to discuss the collaborative marketing efforts that might be more effective together than separately. Two MSUE personnel helped facilitate the discussion which focused on collective marketing efforts, more specifically cooperative advertising. Some discussion evolved with regard to collective buying, but that was not pursued by the group at that time. The group did not create a formal cooperative, but rather each company committed to invest \$650 each to conduct four joint promotions in Year 1. Some businesses not represented at the meeting also agreed to join the effort. The group was called the My Favorite Garden Shops group (MFGS).

The collective funds produced \$6,000 with which to work. One item they collectively agreed to participate in was a “Tour de Plants” brochure, map and coupon. The coupon on the brochure entitled the shopper to one free plant (worth ~ \$5). The idea was to identify participating IRs and encourage consumers to tour multiple sites, hopefully stimulating purchases at each location they visited. Brochures (5,000) were printed at a cost of \$270, which also had a coupon good for a free plant with any purchase that expired at the end of the summer. Twenty-two businesses were listed on the original map and brochure. Each business was given 500 brochures to distribute to their customers. Although the coupon had a Year 1 expiration date, all of the artwork, logo, and map belong to the group and could be used again.

A second cooperative promotional effort was to buy the back cover of the regional magazine *Grand Gardens*. The back cover was a prominent advertising space and, again, the group decided to include a coupon in this advertisement. The advertisement ran in May, June, and September. The magazine had a circulation of approximately 5,000 in the Western Michigan area.

A third collective promotional effort was a series of newspaper articles written by an MSUE Horticulture Educator in the daily newspaper *Grand Rapids Press* (circulation of approximately 475,000). Each of ten articles highlighted one of the member businesses

and each business had a plant or two on which they focused. Members reported some increase in interest, and perhaps sales, from the newspaper articles. Surprisingly, there was some interest at IRs who were not featured in the article (spillover effect).

A fourth effort by the group was the development of a website that included two articles on specific plants. The group purchased the url (<http://www.myfavoritegardenshops.com/>) for “My Favorite Garden Shops” (MFGS) which contained links to each of the cooperators. An internet coupon was posted for \$5 off a \$30 purchase valid at any of the participating retailers and valid through the end of the summer. A local Grand Rapids company charged \$1200 to develop the website. During the first four days of March, the website averaged five unique visitors per day, which increased to about 10-15 unique visitors per day during the spring months. On the website was a map of the participating retailers, a coupon, and an article about the ten best reasons to buy flowering plants locally. A Michigan State University Horticulture student wrote an article on the Perennial Plant of the Year (*Nepeta*) and a second article on tropical plants. Both articles had accompanying photography. The idea was for each participating businesses to focus on promoting the plant featured in the article and have that information ready for inclusion in their own newsletter. Given the diversity of businesses involved at the start, it was a real challenge to agree on one plant on which to focus.

Recap of First Year. In the fall of Year 1, the group reassembled to discuss progress and future efforts. Most were pleased with the initial results. One of the original stores decided to not continue to participate in the collective efforts, but several new businesses were represented at the meeting. They had heard of the collaboration and were interested in participating. Very few coupons were redeemed at any store, with an average of only 10-12 coupons returned to any one store. Comments from IRs included the fact that customers were probably just using the brochure for the free plant and not touring any other retailers. Some still expressed reluctance to send customers to their competitors. One retailer used the *Nepeta* article, but most agreed that they got the article too late in the season to be able to use it (March). They believed it might be more successful if they had it earlier, but deciding on one plant was still a challenge.

Year 2. The MFGS group decided to make an effort to work together a second year. One sub-group was charged with developing membership guidelines and another group agreed to develop promotional efforts for the group. There was a multi-store IR that wanted

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to join the group. Some members felt this firm was too much like a mass-merchant; others were not opposed to that IR joining, but how would their membership fee be charged (by store or by firm)?

For communication efforts in the second year, there was considerable discussion about a joint advertisement in the *Grand Rapids Press* instead of buying the back of the magazine cover. One member called for the rates. For a weekday, a whole page advertisement (in color) was \$1150, a half page was \$475, and a quarter-page was \$125. For a Sunday, a whole page advertisement (in color) was \$1500, a half page was \$850, and a quarter-page was \$275. These fees were acceptable to most of the group and two advertisements (1/4 page) were run in color in the Sunday issue in late April and early May, just ahead of what should be the busiest season. The website was updated for the second year, including a different coupon offer than the one in the Sunday issues of the *Grand Rapids Press*. The MSUE Horticulture Educator also agreed to write at least four more articles for the *Grand Rapids Press* in Year 2. Although there was no charge for her work, the time to write, shoot photography, and submit the articles should be considered a cost of promotion. Each article took approximately six to eight hours to complete. Additionally, the MFGS group had a small display (\$500 cost for booth rental) at the Home and Garden Show in Grand Rapids in March. Coupons were also distributed there, with an offer similar to what would appear in the newspaper just a month later.

At a meeting at the end of Year 2, retailers reported the number of coupons redeemed:

- Grand Rapids Press Coupon \$5 off a \$25 purchase: 1735
- Website \$10 off a \$50 purchase: 1198
- Home and Garden Show distributed 5000 and 300 returned a \$5 off a \$25 purchase (6% return).

Year 3. Fifteen retailers met in the spring of Year 3 and paid \$1000 each to continue membership in MFGS. Some of the funds were devoted to the website, which was revised again and upgraded. The collaborators purchased a room consisting of 16 booths (\$1600) at the Grand Rapids Home and Garden Show, held March 5-8 with an average attendance of 40,000. MFGS members helped to build the booth and staffed it to distribute the \$5 off \$30 purchase coupons.

With the help of dozens of MSU Extension Master Gardener volunteers, they distributed more than 10,000 coupons for MFGS and thousands of individuals ones. The return rate was still about 7.5% of what was distributed. In addition, MFGS paired up with the MSUE public garden tour which is held on a weekend every year in June. Every site on the garden tour had

a “retail partner” who embellished their garden and display during the weekend of the tour. Each MFGS member promoted the tour at their own businesses to increase publicity and attendance.

At a meeting at the end of Year 3, retailers reported the number of coupons redeemed:

- Grand Rapids Press Coupon \$5 off a \$25 purchase: 2478
- Website \$10 off a \$50 purchase: 1422
- Home and Garden Show distributed 10,000 and 7489 returned a \$5 off a \$25 purchase (7.5% return).

Year 4. The 17-member group paid \$1000 each and cooperated to distribute over 3,000 coupons with \$10 off a \$50 purchase on the website and 10,000 coupons at the Home and Garden Show, which had an 8% return. In addition, roadside billboards advertising MFGS were put up April 15 to June 15 at four locations in the Grand Rapids market at a cost of \$650 each. MFGS asked Scotts (a fertilizer company) for co-operative advertising dollars. MFGS members all carry a few lines of the Scotts product, so they could use the co-operative advertising dollars (about \$2500). The products were Osmocote Potting Soil, and Osmocote Planting Soil. These products were part of Year 4’s MFGS advertising program. MFGS also agreed to be part of the West Michigan Home and Garden Show in March again. Their booth space was in a separate room, the Grand Gallery, and cost \$2000. An additional \$500 was spent on more plants and other display contents (decking material). A “booth committee” was established to design, order plants, schedule installation, and schedule shifts for working the booth during the show.

New in Year 4, the MFGS members want to assemble an idea book or small/short lifestyle/gardening magazine. A few quotes were considered beyond reach (\$10,000 or more), but there were several doable options well within their budget. Their idea was to have an informative, inspiring, pretty piece that people would retain to use the information on planting and maintenance as well as use the enclosed coupons. An option was presented that would be mailed to 300,000+ homes and gave MFGS extra to distribute at the Home & Garden Show for \$5000.

What to do for Year 5?

You are the new marketing consultant for the group. The group has several questions for you. For each of these questions, the MFGS group will be interested in the cost and how they can measure the return on their investment (effectiveness of the change). Keep the costs and evaluation in mind as you answer their questions.

1. How should the group evaluate the effectiveness of the billboards which were new for Year 4? How much will it cost to do the evaluation?

2. What should the group feature on their website? You should visit the site and give them some feedback about what they are doing right and what they might consider adjusting for Year 5. <http://www.myfavoritegardenshops.com>

3. The MFGS group would like to develop a booklet much like the lifestyles booklet that some branded annual plant marketers distribute after customers call and request a copy. What would you include in the booklet? How much would it cost to produce 300,000 to 500,000 copies?

4. Use of cooperative advertising dollars is a new concept to most of horticulture, but an exciting one. Essentially, the manufacturer (in this case, Scotts) adds to advertising dollars spent by the group on a product the manufacturer makes. If the group spends \$5, Scotts will give them \$1 to have a total of \$6 to spend. This is, essentially, how they will help finance the booklet (cooperative advertising). What are some strengths/weaknesses of using a fertilizer for cooperative advertising? What other products might be a good fit for cooperative advertising?

5. The Grand Rapids Home and Garden Show has been quite successful for them to distribute coupons for purchases made at MFGS stores and encourage people to use their website. What will the booklet add to this? Will it be worth the cost? How do they link the booklet to the website (any way to drive traffic there)?

6. The group would like to host some type of special event to create excitement and increase the number of shoppers over a specified weekend. Since most of the flowering plants (annuals and perennials) are sold in May, the event should most likely be held the second weekend in June. Create an event for the group to host, including costs of materials and cost of any advertising you might encourage them to undertake to promote the event.

7. There are no written rules for membership into the group at this point. An independent retailer with several locations is interested in joining the group next year. They have already been accepting internet coupons from the website at this retailer. Some of the independent retailers perceive this store to be more like a chain or box store because of their multiple locations. Others voiced concern that this retailer didn't buy into the collaboration initially, so they should pay more than the other "members." What are the key advantages and disadvantages of the independent multi-site retailer joining the group?

Should they be admitted for Year 5? If so, how much should they pay? Incidentally, they already honor the MFGS coupon and aren't even a member yet. What does that say about that company?

8. The MSUE Horticulture Educator started a blog about MFGS. What should she be focused on blogging about? How should the blog help improve purchases?

Appendix 2. Marketing Pricing Case Study

Determining the price of a product or service takes many things into consideration. For nearly four decades, Wholesale, Inc. has been a prominent and successful supplier to the greenhouse growers of all sizes in Michigan. Growers traditionally purchase components to grow products separately from a few wholesale businesses (not just a single source) including Wholesale, Inc. If a commercial greenhouse operator wanted to grow 10,000 vegetative annuals, like geraniums or petunias, or poinsettias, the grower would order media separate from fertilizer and cuttings, containers and tags. The industry has developed to the point where net profit margins, profit made after direct and indirect costs are covered, are very slim. Growers know prices are competitive because their own profit margins are thin. Imagine being a wholesaler and attempting to price your product when your customer can literally "shop around" for the best price. The answer becomes easier when the product is differentiated and/or the price difference becomes greater.

Especially for the small producer (classified as growers or farms with sales of <\$100,000 per year), who purchases in smaller quantities, the price they pay for components for production becomes a real issue. They cannot purchase larger quantities to get the discount their larger competitors receive. They could come together in a cooperative and purchase in quantities and distribute them among the cooperative members. Wholesale, Inc. can't (and doesn't want to) form a cooperative for or with some of their better customers who are small growers. Most small growers don't want to join in a cooperative either. Another interesting aspect Wholesale Inc. faces is their communication and service to the smaller grower. It takes at least one day for a salesperson from Wholesale, Inc. to visit three clients. Most of Wholesale Inc.'s salesperson's time is spent on larger greenhouse clients. Smaller clients don't get visited by Wholesale, Inc.'s staff more than once each year. They do speak often (once per month) on the telephone. They aren't ignored, but economics don't allow the wholesaler to visit smaller clients

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very often. Larger clients purchase more products, contribute more to the bottom line (profits), and get more frequent visits by Wholesale, Inc.'s staff more frequently. Wholesale Inc. wants to develop a creative, yet profitable, pricing strategy alternative that might be attractive to the smaller grower, giving them some price advantage like they can the larger grower.

Wholesale, Inc. is considering price bundling packages especially for their small growers for branded vegetative annuals, poinsettias, and cutting geraniums. They would like to offer a "Complete Package" price or program where smaller growers could purchase a "bundle" or package of products rather than individual components. What can you suggest as a strategy they try? How would you price each bundle of products? Which commercial greenhouse products would you package in the bundle? What alternatives can you permit (what substitutions are feasible)? Knowing that you would only get to visit small growers once annually, how would you communicate with your small growers about such a program? At what time of year would the small growers be most receptive to buying into this program? As part of your research, look-up costs of products you would package, using several wholesale operations as your sources. Unearth your cost of production notes and develop a novel price bundling strategy that you consider to be attractive to the small grower, but profitable for Wholesale Inc. How many small growers are there in Michigan? How many branded vegetative annuals, geraniums, and poinsettias are sold at wholesale from Michigan growers? What share of the market might Wholesale, Inc. expect to capture with this new price strategy? Which products (branded vegetative annuals, poinsettias, geraniums) are a good first choice to try this strategy? What other product combinations would you suggest (with some cost and pricing examples)? What are examples of the prices, both bundled and unbundled, of those products? Show price examples and mark-up on cost. How much profit should Wholesale Inc. make on each bundle? If they do implement bundling, give some examples of how you suggest they track the effectiveness of the price change?

Appendix 3. Marketing Branding Case Study

The Michigan Nursery and Landscape Association (MNLA) initiated the plant promotion committee eight years ago. The purpose of this committee is *"to promote the Michigan Certified Nursery program by selecting plants worthy of promotion and bestowing an award of merit to them in order to promote the selected plants . . ."* Since then, several plants were

selected for the Grower's Choice Award (a trademark for the MNLA and this program). Most plants were either woody trees or shrubs (no annuals or perennials – they have their own awards programs like All-America Selections (AAS) and the Perennial Plant of the Year (PPY)). The program died five years later due to the lack of a response by both customers and retailers.

Your marketing group has been asked to investigate the possibility of reviving the program for next year. If MNLA were to revive the program, would you change the name (was that part of the problem)? What would be a better name for the program? How should they now promote this program to consumers, members, growers, and suppliers to make it effective? How many branded woody plants are on the market today (compared to herbaceous plants)? Can the program make a difference in marketing woody plants? How can the independent garden center plants be differentiated from national woody plant brands like Color Choice (CC)? What can you learn from CC or AAS or PPY that might be helpful in promoting Grower's Choice plants?

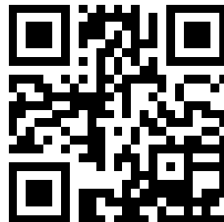
Consider a typical channel of distribution for woody plant material (draw it to show how plants move from propagator to end-consumer). Identify at least 5 different types of businesses who may be involved in growing and marketing woody plants to customers. Show MNLA ideally how partners in the supply chain would participate in delivering or executing this program. Describe a promotional objective and strategy for the Grower's Choice program for each member in the channel. Assume no one knows anything about the program. Use information from the advertising and promotion chapters. What are some truly creative ways industry members can promote this program?

Who are purchasers of woody plants? What does this market segment look like demographically and how many people buy woody plants each year? How much of the market share would Grower's Choice expect to get, especially in Michigan? If plants are grown in Michigan and shipped to markets throughout the U.S. east of the Mississippi River, do people in other states care if a plant is a Michigan Grower's Choice award-winner? Who pays for the promotional efforts? If, for example, MNLA buys tags or radio time, who pays for that? How do you get participation in the program? Should MNLA even try to revive it?

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For a short presentation about NACTA



Evaluation of CROPVIEW as a Crop Science Teaching Resource for Post-Secondary Educators¹



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Abstract

Since less of the American population is involved in agriculture fewer students in university and high school biology courses are familiar with plant species that supply most of the world's food. Crop science concepts such as identification, adaptation characteristics, and current topics related to food production have traditionally been introduced in classroom lectures and reinforced using seed and plant specimens. This study investigated the development and efficacy of the website CROPVIEW as an educational tool in an agriculture curriculum designed for a diverse audience of college students enrolled in undergraduate courses in the College of Agriculture at three different universities. The target population consisted of all undergraduate students in those courses (N= 287). The researchers used a general knowledge instrument to gather data. The study's findings conclude that the website was equally as effective for student learning of agricultural information as traditional teaching methods.

Introduction

Since less of the American population is involved in agriculture, fewer students in university and high school biology courses are familiar with the plants that are responsible for feeding the world. Plants are generally less popular than animals as subjects in secondary school science classrooms, and the focus on understanding plants and their role in the environment has faltered accordingly (Bebbington, 2005; Darley, 1990). In fact, some authors have used the term "plant blindness" to describe the general public misanthropy towards plants (Wandersee and Schussler, 1999). Despite the waning popularity of plants in the science classroom, plant identification is highly important for proper communication across international borders, and naming plants properly is important for understanding them in scientific context (Nesbitt et al., 2010). For those in agricultural education, this paltry background in plant science is the starting point from which crop science education must proceed at the college level.

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Bringing crop science students to a basic level of knowledge of plant science and adaptation principles, along with identification of crop plants and seeds has traditionally been the goal of undergraduate lectures in university agricultural programs. Students must grasp these basics before they can understand concepts such as how climate change may impact food production in different parts of the world and for understanding the importance of agriculture to their personal lives in a civic or political context. In addition, an international focus in the agriculture curriculum is needed to prepare students for a globalized market and to understand the impact of agriculture on global events (Bruening and Frick 2004).

There are some significant logistical barriers when it comes to teaching crop science topics. For traditional in-class laboratory exposure, plant specimens and seeds must be maintained and can occupy valuable storage and growing spaces, which can be very expensive. Distance education, which is a rapidly-growing aspect of university education can potentially reach more students per instructor and save on educational costs (Nachmais et al., 2000). However, on a per-course basis, developing and implementing a distance education course can cost more than traditional delivery (Sterns et al., 2005). Presenting lecture information in an interesting and effective way that will include student laboratory experiences is especially challenging for distance education. Creating a reusable learning object (RLO) (Wiley, 2000) for crop science education that can be freely accessed and used by multiple institutions and course participants in both live and distance-delivered courses could potentially be more cost effective and more engaging than current instructional approaches.

In previous studies, instructors have used web-based images to teach or enhance plant identification learning with varying degrees of effectiveness. Anderson and Walker (2003) found that students scored suspiciously well on web-based identification exams and concluded that students might be memorizing the photos rather than learning actual identification skills. Kahtz (2000) developed a photograph-based program that showed identifying characteristics across seasons for each of the 300 plants available to students in a woody plants course. The students also participated in a traditional identification laboratory. The students in this course evaluated the computer-assisted instruction tool and deemed it to be helpful for review, but not for initial learning (Kahtz, 2000). Teolis et al. (2007) concluded that their distance learners may have benefited from a greater variety of images showing the plants at different times in the growing season and that

illustrated specific identifying features. Their study also concluded that students should be encouraged to visit a botanical garden or other location where the plants studied could be observed directly.

Overview of CROPVIEW

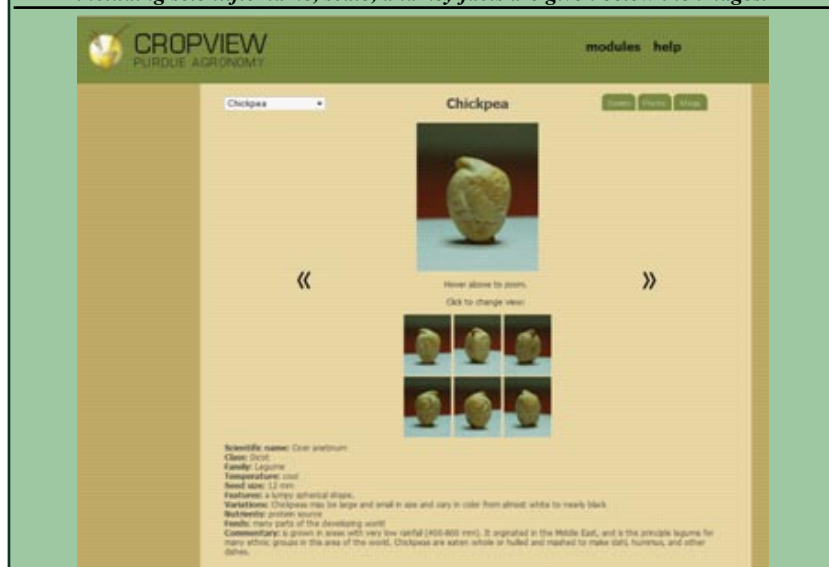
The CROPVIEW (Comprehensive Resources for Observing Plants in a Visual Interactive Enhancement Window) program was developed as a RLO that would increase student understanding of global food production systems and the science of food production as it relates to agricultural practice, plant biology, geography, and climatology (<https://www.purdue.edu/cropview/>). A team of crop scientists, students, and artists from the Department of Agronomy, along with programmers, web designers and additional artists from the Center for Instructional Technology and Training, all at the University of Florida created the program. This RLO was intended to be utilized in both post-secondary and secondary level science curricula.

The team utilized the *ADDIE* instructional design model, which provides a step-by-step process that helps training specialists plan and create training programs (Gagne et al. 2004; Chan 2006), to create CROPVIEW. The *ADDIE* design model revolves around five components: analysis, design, development, implementation, and evaluation. In the analysis step, the team observed that students often photographed specimens and studied from digital images rather than notes or sketches of the seed and plant specimens presented in class. In the design step crop-science concepts were organized in discreet modules that were accessible from a central front page. This allowed students to study at their own pace. In the development step, four modules were created: (1) Introduction, consisting of plant science concepts such as photosynthesis and symbiotic nitrogen fixation; (2) Nutrition, which presented topics such as caloric needs for survival, amino acid balance, and an introduction to fatty acid types; (3) Biomes, which introduced the major world biomes and listed crops adapted to each; and (4) Plant and Seed identification virtual laboratory, which included seed images that could be magnified and rotated 360° by progressing through thumbnail images taken of a rotating seed, and high quality images of crop plants representing different phases of growth (Figure 1).

The plant and seed module also included identifying characteristics and additional information about each crop such as the scientific name, basic taxonomic data, adaptation, additional features, nutrients supplied, and anthropological notes (Figure 1). The plant image pages included the growth limitations of the crop,

Evaluation of CROPVIEW

Figure 1. Screen shot from the Seed/Plant identification module. The images showing the rotated seed are below the viewing window. Panning over the first of the images reveals characteristics to assist in identifying the seed. Additional information, including scientific name, scale, and key facts are given below the images.



such as temperature and rainfall ranges. It is worth noting that the crop adaptation data was presented three times in the series of modules, in biomes, with the seed images, and finally with the plant images. The information for the plant-seed module was drawn from a database into a template using a query system. This design method makes it possible to add to the module without extensive reformatting.

Quizzes with instant feedback were included at the end of each module to allow students to evaluate their own learning. Since student learning may be further enhanced through game play (Randel et al., 1992) a game called “Feast or Famine” was added to the CROPVIEW webpage to encourage higher level thinking skills, specifically, students’ ability to identify biomes based on global location. The students had to choose crop seeds that would be well-adapted to the region and provide proper nutrition to the communities there (Unruh Snyder et al., 2011). The game also tested students’ ability to identify seeds by providing more seed images and less identifying information on the seeds with each round.

Objectives and Hypotheses

The current study assessed the effectiveness of CROPVIEW as a classroom learning aid based on the implementation and evaluation steps

prescribed by the ADDIE method (Gagne et al., 2004; Chan 2006). A preliminary objective was to profile the students’ prior exposure to plant and crop science instruction. Then, we hypothesized that students with access to CROPVIEW would demonstrate more crop science knowledge than those without access at the end of a related course. We also hypothesized that students with access to CROPVIEW would develop better crop seed and plant identification skills than those without such access. The final objective was to evaluate student perceptions of CROPVIEW as a tool to enhance their understanding of crop science materials.

Materials and Methods

The research design for this study was causal comparative (Fraenkel and Wallen, 1993), used to identify possible causes; similar to a correlation, with the objective of testing the impact of CROPVIEW on student knowledge of basic crop science concepts and of seed identification skills in eight classes at two institutions over two years. In 2007, classes at University 1, ($N=73$ and $N=42$), were selected to evaluate CROPVIEW. In 2008, classes at University 2 ($N=56$), University 2 ($N=22$ and $N=53$), and the University 1 ($N=42$) evaluated CROPVIEW. Each of the classes was assigned to

Table 1. Descriptive information for courses participating in the CROPVIEW evaluation

Institution ²	Course Title	Materials available	N	Year
UF	Plants that Feed the World ³	Classroom only	42	2007
UF	Environment Food and Society ³	CROPVIEW only	73	2007
VT	World Crops and Cropping Systems ⁴	CROPVIEW only	56	2008
PU	Introduction to Crop Production ⁵	Both	22	2008
UF	Plants that Feed the World	Classroom only	42	2008
PU	World Crop Adaptation and Distribution ⁶	Both	53	2008

²UF = University of Florida; VT = Virginia Tech; PU = Purdue University.

The following are the course descriptions directly from each University’s website:

³Introduction to 25 of humankind’s most important food crop plants with an emphasis on soil and climatic adaptations, major producers and consumers, nutritional attributes, processing needs and types of products.

⁴Global issues and trends in population growth, natural resource (soil, water and plant genetic biodiversity) utilization, climate change and potential impacts of current trends on agriculture, natural resources, global food security, and sustainability.

⁵An introduction to world crops, their primary regions of production, the factors that determine where they are grown, and their economic importance. Describes the various factors that can be managed to improve crop yields. Examines present and potential systems of farming for improved crop production in the major climatic and soil ecosystems of the world.

⁶Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding.

⁷Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man’s intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment.

one of three categories with regard to plant and seed identification specimen exposure (Table 1). The classes had either no CROVIEW exposure, but classroom exposure to the same topics, including plant/seed identification specimens (Classroom only); exposure to the CROVIEW online specimens only (CROVIEW only); or exposure to both the CROVIEW website and classroom instruction on the same topics, including identification specimens (Both).

A skills assessment instrument was developed to evaluate knowledge of the material presented in each of the CROVIEW modules. The assessment instrument consisted of 37 questions, four of which addressed prior knowledge of crop science topics, 24 of which addressed material presented by CROVIEW, and nine which were satisfaction evaluations based on a Likert scale to evaluate student perceptions of CROVIEW and of the related course in which they were enrolled. Demographic data such as gender, age, college, major, grade level, and state/country of origin, was collected through seven supplementary questions. A panel of experts reviewed the draft instrument for face and content validity and revisions were made to the resulting final instrument. University of Florida's Institutional Review Board approved the study protocol and all participants provided informed consent prior to participation in the study. Students were instructed to review the CROVIEW materials outside of class by studying one of the four modules per week in the weeks leading up to the assessment. Students were given a small bonus point incentive for participating in the assessment, but their score did not impact their course grade. We asked in our assessment if the students were familiar with the CROVIEW website as a means of measuring their use of CROVIEW. In addition, we also set up a Google analytics account to track the number of times students entered the website from each location.

Statistical Analysis

A general linear model procedure (Proc GLM) using each class population and year as main effects, followed by a protected least significant difference (LSD) comparison of means ($\alpha = 0.05$), was used to evaluate the mean scores from the instrument using SAS software (SAS version 9.2, 2008). Further exploration of correlations with class performance and state/county, college, age, and gender was performed using the Statistical Package for the Social Sciences (SPSS, Cary, NC.).

Table 2. Percentage of students who had earned a given number of college credit hours on each subject areas or completed only a high school level course (N=287)

Topic	3 credits ^a	7.5 credits	High school only	No response ^b
Plant science/botany	38%	11%	26%	18%
Crop science	34%	10%	27%	19%

^aData representing percentage of students with only one credit hour not shown.
^bThe instrument did not differentiate between a student's intent to skip the question or to respond as no exposure to the subject.

Results

The student population consisted of 160 males, 116 females, and 11 unspecified (N=287) and included 25% freshman, 30% sophomores, 30% juniors, 7% seniors, 1% graduate students, and 7% unspecified. Forty-five percent of the students were enrolled in a college of agriculture and/or life sciences; the remaining students represented a wide range of colleges within each university, including liberal arts and sciences (26%), business (6%), engineering (5%), natural resources (4%), and journalism (2%).

We evaluated the students' prior exposure to plant and crop science instruction; of the students who responded, 38% had previously earned 3 or more college credits in a crop science course, and 38% had earned 3 or more credits in plant sciences or botany (Table 2). Ten percent of the students had earned 7.5 or more credits in a crop science course (Table 2). Some of the students had some high school level exposure to plants and crop science (26% and 27%, respectively; Table 2). The results of the correlations performed showed that previous college credit did not influence the test scores of the students.

Student performance on the 24 assessment instrument questions evaluating CROVIEW module content was used to address our first hypothesis that students with CROVIEW exposure would gain more crop science knowledge than those without this exposure. The year effect was not significant for these results, so student response results were pooled across years for each classroom population. Students scored an average of 14.85 (SD= 4.95), out of 24 in classes with Classroom only, CROVIEW only (M=14.34; SD=5.23), and Both exposures (M=12.73; SD=5.43).

Students in the three exposure categories scored similarly on the seed identification section. Students correctly identified an average of 2.7 out of 5 grains presented (SD=1.55), regardless of whether they studied solely online or with in-class materials, however, those with access to both resources scored lower with only 1.9 correct answers (SD=1.7). Students with classroom only exposure correctly identified more of the five legumes presented (M=3.9, SD=1.1) than did students with CROVIEW only, (M=3.0, SD=1.1). Students with access to Both resources did not have significantly different scores (2.9 of 5; SD=1.8) than

Evaluation of CROVIEW

Table 3. Evaluation instrument scores grouped by exposure to in-class materials, online modules, or both resources for seed identification

Exposure	Introduction to plant science	Nutrition	Biomes	Seed identification	Overall % correct
	Number of correct answers				
	(5)	(5)	(4)	(10)	
Classroom only	3.3 a ¹ (1.2)	3.9 a (1.1)	2.3 a (0.7)	5.9 a (1.7)	62 a
CROVIEW only	3.0 a (1.1)	3.0 b (1.4)	2.1 ab (1.0)	6.5 a (2.9)	60 a
Both	2.4 b (1.2)	2.6 c (1.2)	2.0 b (1.0)	5.8 a (3.4)	53 b

¹Means within a column followed by the same letter are not significantly different at the 0.05 probability level using the protected LSD. Standard deviation is provided in parenthesis.

Table 4. Student perceptions of course satisfaction and knowledge of seeds (N=287)

Survey Question	Delivery Method	Mean ¹	Std. Deviation	Std. Error
I am familiar with the use of the CROVIEW website? ²	Both	2.9 b	1.3	0.15
	CROVIEW	4.3 a	0.7	0.06
	Classroom	1.7 c	1.0	0.11
I have a general knowledge of plant sciences. ²	Both	3.7 a	0.8	0.10
	CROVIEW	3.7 a	0.7	0.06
	Classroom	3.0 b	1.0	0.11
I am familiar with the terms used in identifying the seeds of major world crops. ²	Both	3.6 a	0.8	0.09
	CROVIEW	3.6 a	0.9	0.08
	Classroom	3.7 a	1.0	0.11
Overall, I was __ with the course content and materials. ³	Both	3.6 a	0.9	0.11
	CROVIEW	4.1 b	0.7	0.06
	Classroom	4.5 c	0.8	0.09
I was __ with the navigation in Cropview. ³	Both	3.4 a	0.8	0.12
	CROVIEW	4.0 a	0.9	0.08
	Classroom	.	.	.
I felt I had a positive learning experience in this class. ²	Both	3.4 a	0.9	0.11
	CROVIEW	4.3 b	0.8	0.07
	Classroom	4.6 c	0.6	0.07
I feel more confident in my ability to identify seeds. ²	Both	3.5 a	0.9	0.11
	CROVIEW	3.9 a	0.8	0.07
	Classroom	4.4 b	0.7	0.08

¹1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

²1=very unsatisfied, 2=unsatisfied, 3=neutral, 4=satisfied, 5=very satisfied.

³Means within each question that have the same letter are not significantly different at the 0.05 probability level as determined by a protected LSD post-test.

Table 5. Representative themes derived from student responses

Theme	Student Comments
Extremely useful class and website materials. (35%)	R (1): "I loved the crop science modules. I think they're a great learning tool that is much more effective than reading from a book or hearing a lecture, very useful" R (12): "It was an informative program."
Cropview was a great experience (60%)	R (2): "It was a very eye opening and helped me understand practical application of crops/where they are found" R (3): "It was an excellent simulation." R (10): "I liked the computer simulation, I thought it was neat that it was self paced and very interactive. Having to use critical thinking was definitely advantageous."
Hands on learning is better (2%)	R (11): "The course definitely enlightened me to my own deep interest in soil, water, and plant science. I took it as an elective but now I want to change majors."
Improve seed pictures (3%)	R (4): "Seed pictures are too small."

²Minimal feedback was received (N=28 out of 287).

those with CROVIEW only access to seed and plant identification materials.

There was no significant difference in student confidence in their ability to identify crop seeds and plants between the exposure groups. The students with classroom only plant and seed materials were most satisfied with overall course content and materials and overall had positive learning experiences, while the students with both web and live materials were the least satisfied (Table 4). The students that used CROVIEW were satisfied with the website overall. The students in the course with live materials were most confident in their ability to identify seeds followed by the website only and then the both (Table 4).

Discussion

Although our student population had a higher percentage of students with some previous exposure to plant sciences than what most educators have experienced (Wandersee and Schussler, 1999), the idea of creating examples to educate students to this subject content is critical for their understanding our global food system. Judging from student responses, we were effective in producing an easily-navigated website, we had positive comments about the RLO based on 60% that said that they had enjoyed the experience, had high satisfaction based on written comments (Table 5).

While student crop science knowledge may not have been significantly enhanced by the CROVIEW RLO, as determined by the approximately 50% correct scores on the assessment (Table 3), students where CROVIEW was offered alone had an enjoyable class experience (Table 4). It is worth noting that this assessment was not a part of the students' grades, and there was no penalty to the student for a poor score. The developers speculate that if CROVIEW had been presented as an integral part of the curriculum rather than supplemental material, the scores may have been quite different.

The scores on the seed identification portion of the assessment may indicate that CROVIEW was as effective as live materials in developing this skill. The

students' somewhat poor performance on the general knowledge test in this study does raise concern on the instructors should best approach this teaching subject of world food crops. However, the researchers feel that the basic knowledge in this area is somewhat challenging to teach and student exposure to this information needs to be integrated in other curricula where appropriate, especially with regard to crop facts and seed and plant identification of major food crops that feed our world.

The designers are hopeful that CROVIEW will be an effective tool for presenting crop science information to a global audience. A true test of this RLO as a method of introducing crop science materials to students with little to no prior knowledge of the subject matter has not been met. Although many students in the current study had not had a prior course in plant or crop science, they were currently enrolled in a course with similar material. The modules would need to be presented to college students in a class studying an unrelated subject or to a group of high school science students to determine the efficacy of the CROVIEW RLO as a mode of instruction and interest-building for students who have had no prior instruction in the science of world food production.

Additions that have been made to CROVIEW during its brief residency at Purdue University have already demonstrated the ease of incorporating new technology such as Google Maps into the program. In addition, the website now includes a database that can be updated by the web administrator to include more seed pictures.

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A Descriptive Evaluation of Agricultural Education eLearning Courses: Students' Perspectives



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Abstract

There has been an increasing push to utilize eLearning resources as a more active component within agricultural education due to increased presence of technology in society. Instructors must overcome the barriers to social interaction and preserve the knowledge facilitated by traditional educational environments in using technology enhanced learning environments. Means of measuring and examining student satisfaction within these environments are necessary to ensure learning is taking place. This study used quantitative research surveys to evaluate the eLearning environment and provide descriptive statistics regarding the level of student satisfaction given the current curriculum. The data from this evaluation indicated that students valued instructor support, student interaction and collaboration, and autonomy as components of satisfaction more so than active learning. Students scored the areas related to instructor interaction most highly, seeking instructor facilitation and support. The areas related to engaging with other class participants also scored highly. The students were interested in collaborating and interacting with their classmates. Future research should address the relationships between the variables and student satisfaction. The relationships determined by further study will help shape appropriate practice in terms of increasing student satisfaction.

Introduction

As research is conducted in the distance education environment, one of the key components to evaluate is student satisfaction. Rivera and Rice (2002) found that while student performance is an integral part of the eLearning experience, simultaneous student satisfaction with the experience is also crucial for the continued success of a program. Swan (2001) found strong positive linkages between the level of student satisfaction and the program design. Further research

conducted by Richardson and Swan (2003) found interaction between participants can substantially improve the level of student satisfaction when utilizing distance education as an instructional tool. Student satisfaction is positively linked to perceived learning and the number of modules contained in the course (Swan, 2001). The content and interaction necessary to maximize student satisfaction can more accurately be established by describing a course and the resulting student satisfaction within that course.

Social presence is a key element of the distance instructional method. Short et al. (1976) define social presence as the amount of one individual's communication with other individuals and the interpersonal relationships that result from this communication. Social presence has been identified as critical for the successful absorption of knowledge within the distance educational framework. The quality of the interactions is as important as the quantity of the interactions (Garrison and Cleveland-Innes, 2005). Social presence approaches in learning are both a process that guides the student and also an outcome resulting from the student's engagement as higher levels of learning emerge from comfortable communities of inquiry (Cleveland-Innes and Emes, 2005). A high degree of correlation has been established between student performance on examinations and the student's social presence in the distance course, implying that stronger social presence is a significant factor in an eLearning environment (Picciano, 2002). Students are able to mature to higher levels of achievement with less instructor interaction as social presence in the course increases (Swan, 2001).

Another component of interest is the learning environment within the asynchronous distance educational framework. Students seeking the flexibility of eLearning courses to help accomplish their educational goals should enter the course with a positive attitude. The attitude developed by students

is a direct reflection of their experiences with their initial courses and positive experiences tend to lead to greater levels of learning maturation (Brooks, 2003). Confidence building techniques such as instructor guidance through sample assignments and clear and concise instructor expectations at the beginning of the course can aid in developing a positive learning environment (Mupinga et al., 2006). In addition to establishing positive expectations and appropriate guidance, the distance environment can successfully blend traditional teaching methods with the electronic distance delivery system to provide a positive educational experience by facilitating more interactive and flexible discussions, (Swan, 2002).

Distance learning is playing an increasingly larger role as a teaching component in the field of agricultural education. Research has demonstrated that many College of Agricultural and Life Sciences faculty members lacked sufficient knowledge of the fundamentals of distance education (Stedman et al., 2011). Literature indicates that the occurrence of distance learning instruction is ubiquitous in many agricultural education departments (Roberts and Dyer, 2005). Agricultural faculty are facing increased pressure to provide online courses. Classroom students are often more satisfied with instruction than students in an online environment (Wachenheim, 2004). Student satisfaction with these courses should be routinely examined in order to ensure maximum effectiveness (Murphy, 2000; Kelsey et al., 2002; Murphrey and Dooley, 2000; Roberts et al., 2004). Many online students seek to maximize interaction with instructors and fellow students in order to gain satisfaction (VanDerZanden and Woline, 2008). Online course evaluations have shown that students value frequent instructor feedback, clearly defined expectation, course guidance, and communication within in the framework of online instruction (Schroeder-Moreno, 2010). The study was conducted to acquire descriptive statistics on student satisfaction with eLearning courses.

The theoretical framework for this study builds upon the seminal components of both social presence theory and motivational needs theory. McClelland (1987) asserts that life experiences provide the formative basis for needs, and that these generally are classified into three categories: achievement, power, and affiliation. Individual motives and behaviors are shaped by these needs. An individual seeking achievement will adopt practices that will facilitate achievement. An individual striving for power will assume behaviors that aid in the acquisition of power, while those requiring affiliation will work towards satisfactory relationships with others.

The individual usually strives for success in seeking to fill the need for achievement. An individual must be challenged while not pursuing tasks that present the probability of failure. The individual will seek constant improvement in the task to meet this need. A person with this set of needs does not work idly; rather this individual will actively search for additional challenges that will help them meet their need (McClelland, 1987).

An individual with a drive for power constantly works to direct others as a means of fulfilling their ambitions. These ambitions often consist of individual or organizational goals. The individual will look to exercise influence in accomplishing tasks and will seek out positions from which this power can be exercised. An individual will maintain the appearance of having influence in addition to pursuing their power goals (McClelland, 1987).

The last need addressed within the motivational needs framework is the need for affiliation. The individual must feel acceptance within the group by establishing positive relationships with others to fulfill the need. The individual will actively seek accord and commonality in interpersonal relationships within the group. The social acceptance and interaction component is the key to individuals with a strong need for affiliation. The ultimate goal of this need is to achieve social reciprocity between members of the group (McClelland, 1987).

Student satisfaction can be defined as the sum of individual subjective evaluation and experience, and the gap between expectations and realizations from the service received (Oliver, 1999). The innate complexity of student satisfaction means a great importance must be put on learning about its makeup. Researchers must understand the components that affect the satisfaction of students in the eLearning environment (Jurkowitsch et al., 2006). This component can most effectively be analyzed within the context of social presence theory. In order to appropriately understand and improve upon the existing eLearning framework, student satisfaction, the learning environment, and social presence must be evaluated to establish benchmarks for progress. The student's needs and satisfaction can be improved through this evaluation (Kara and DeShields, 2004).

Social presence theory provides insight into the student satisfaction component of the eLearning experience. Short et al. (1976) define social presence as the salience level of one person's communication with other people and the resulting interpersonal relationships. The three components of social presence in the eLearning environment are interactivity, social context, and online communication. The components

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revolve around communication styles, activities, and the establishment of social identity within the context of eLearning (Tu and McIssac, 2002).

This study was a part of a larger study to assess graduate student's perceptions of the learning environment, social presence, and satisfaction with agricultural education eLearning courses at Texas A&M. More specifically, this study sought to:

1. Describe students' learning environment in eLearning courses;
2. Describe students' social presence in eLearning courses; and
3. Describe students' satisfaction in eLearning courses.

The existing framework for the eLearning environment can be validated and quantified by describing students' learning environment in eLearning courses. This aspect also provided benchmark measurements against which the social presence and satisfaction components could be evaluated. Social presence plays a vital role in students' learning abilities. The study sought to establish current levels of social presence and identify those areas in which it could be improved. The overall student satisfaction with eLearning courses was evaluated to determine the current status of the learning style and establish the need for further refinement.

An evaluation must be conducted that can provide the necessary information to document the students' experiences to properly describe the key elements of eLearning. When conducting this research it is also necessary to incorporate stakeholders into the process. Stufflebeam (1973) identified the stakeholders as individuals who both participate in the evaluation and also use the results. An objective evaluation based on the Context, Input, Process, and Product (CIPP) evaluation model was selected to accomplish this task (Stufflebeam, 1973). This model's goal is to collect data about a population and its surrounding environment while the input component will evaluate the program and its capabilities for achieving the objectives to address the context component. The process evaluation requires a constant evaluation of the experience for the duration of the process, thus capturing observable incidental impacts. The product evaluation will measure and assess the program's achievements (Stufflebeam, 2000).

Materials and Methods

The term eLearning was to describe distance and online courses for the purpose of this study.

The study's objectives were analyzed through the use of descriptive statistics. Agresti and Finlay

(2009) wrote that descriptive statistics display the characteristics of different groups and allow a determination of attitudes towards a specific variable. Descriptive statistics are an approach to arrange data into frequency distributions and deliver a picture of the data that can be used to perform quantitative analysis (Agresti and Finlay, 2009; Black, 2001). Further, descriptive statistics allow researchers to provide general information about a particular group using a dataset (Black, 2001). This study was deemed exempt by the TAMU Institutional Review Board, and was assigned protocol number 2010-0936.

Quantitative research served as the methodology used to assist the researcher in ascertaining the answer to the research questions. Fraenkel et al. (2012) indicated that quantitative research is developed prior to the study, utilizes deductive reasoning to examine theories, employs standardized measurements, and analyzes numerical data.

The population in this study was graduate students enrolled in agricultural education eLearning courses at Texas A&M. This study was conducted as a census, as the entire population ($N = 164$) was surveyed. Fraenkel et al. (2012) indicated that employing a census enables researchers to eliminate potential errors related to sampling. The results allow the researchers to generalize the findings to the target population.

Two previous surveys and demographic questions were used by the researcher to create a 48 item instrument to address the study's objectives. Graduate student satisfaction in eLearning courses was obtained by using the Distance Education Learning Environment Survey and the Social Presence Scale. A team of distance learning researchers at Texas A&M analyzed the content and face validity of the instrument. The combined instrument's reliability was calculated *ex post facto* to be $\alpha = .88$, resulting in a high degree of internal consistency (Cronbach, 1951).

The Distance Education Learning Environment Survey was used in previous research to assess graduate student's perceptions of the learning environment in eLearning courses (Cuthrell and Lyon, 2007; Walker and Fraser, 2005). The Distance Education Learning Environment Survey (DELES) used the following constructs: instructor support, student interaction and collaboration, personal relevance, authentic learning, active learning, and student autonomy (Fraser, 2002). The Distance Education Learning Environment Survey was made up of thirty-four items for participants to assess the eLearning environment. The instrument had the following anchors: 5 = always, 4 = often, 3 = sometimes, 2 = seldom, 1 = never.

The Social Presence Scale contained fourteen items for participants to measure the instructor's immediacy. As such, it had the following anchors: 5 = strongly agree, 4 = agree, 3 = uncertain, 2 = disagree, and 1 = strongly disagree. Undergraduate and graduate students enrolled in online courses have been examined in studies using the Social Presence Scale (Cobb, 2009; Richardson and Swan, 2003) and its *ex post facto* internal consistency was calculated at $\alpha = .94$ for this study.

Qualtrics™ was used to administer a web-based questionnaire. The Tailored Design Method for creating and disseminating an electronic survey was utilized by the researchers (Dillman et al., 2009). Initially, participants received an email notification of the study. Two days later, participants received an email that included a link to the questionnaire in Qualtrics™. Two different email notices, each one week apart, were emailed to non-respondents. One hundred sixty-four participants received the questionnaire, and 118 participants responded resulting in a 71.9% response rate ($n = 118$) in the study. Nine questionnaires were eliminated from the study due to incomplete information, reducing the number of usable responses to 109. Early and late respondents were analyzed to assess non-response error and no significant differences existed between the two groups. This allowed the results to be generalized to the target population (Lindner et al., 2001).

The objectives were examined through the use of descriptive statistics. Black (2001) stated that descriptive statistics allow researchers to provide general information about a particular group from the gathered data. The information given by descriptive statistics is not dependent on whether population inferences are pursued. Descriptive statistics create a picture of the data that researchers can use to form a basis for quantitative analysis (Black, 2001).

The majority of participants were female ($n = 73$, 66.97%), white ($n = 97$, 88.99%), between 25 to 34 years old ($n = 69$, 63.30%), and lived in the College Station area ($n = 61$, 55.96%). The study was as an evaluation of student satisfaction at a single institution's graduate eLearning program.

Results and Discussion

The first objective of the study was to describe graduate students' learning environment, social presence, and satisfaction in distance courses. Instructor support ($M = 4.28$, $SD = .63$), student interaction and collaboration ($M = 4.16$, $SD = .97$), and student autonomy ($M = 4.01$, $SD = .79$) received the highest scores for learning environment. Active

learning ($M = 2.92$, $SD = .53$) earned the lowest score from participants (see Table 1).

Table 1. Descriptive Statistics for Student's Learning Environment in eLearning Courses

Constructs	N	M	SD
Instructor Support	109	4.28	.63
Student Interaction and Collaboration	109	4.16	.97
Student Autonomy	109	4.01	.79
Authentic Learning	109	3.86	.90
Personal Relevance	109	3.43	.63
Active Learning	109	2.92	.53

Scale: 5 = *always*, 4 = *often*, 3 = *sometimes*, 2 = *seldom*, 1 = *never*.

Describing student's social presence in distance courses was part of the study's second objective (see Table 2). The items that received the highest scores were "instructor facilitated discussion in the course" ($M = 4.44$, $SD = .75$), "I felt comfortable interacting with other participants in the online course" ($M = 4.37$, $SD = .82$), "I felt comfortable participating in the course discussions" ($M = 4.23$, $SD = .79$), "I felt comfortable conversing through this text-based medium" ($M = 4.19$, $SD = .92$), "computer-mediated communication is an excellent medium for social interaction" ($M = 4.14$, $SD = .95$), and "the instructor created a feeling of an online community" ($M = 4.04$, $SD = .76$) earned the highest score of the items in the Social Presence Scale. The item that received the lowest score was "messages in the online course were impersonal" ($M = 2.51$, $SD = .91$).

Table 2. Descriptive Statistics for Student's Social Presence in eLearning Courses

Items	N	M	SD
The instructor facilitated discussions in the course.	109	4.44	.75
I felt comfortable interacting with other participants in the online course.	109	4.37	.82
I felt comfortable participating in the course discussions.	109	4.23	.79
I felt comfortable conversing through this text-based medium.	109	4.19	.92
Computer-mediated communication is an excellent medium for social interaction.	109	4.14	.95
The instructor created a feeling of an online community.	109	4.04	.88
I was able to form distinct individual impressions of some course participants even though we communicated only via a text-based medium.	109	3.96	.76
The introductions enabled me to form a sense of online community.	109	3.91	.62
Discussions using the medium of computer-mediated communication tend to be more impersonal than face-to-face discussions.	109	3.89	.73
I felt my point of view was acknowledged by other participants in the course	109	3.68	.74
I felt comfortable introducing myself in the online course.	109	3.63	.70
Computer-mediated communication is more impersonal than video teleconference discussions.	109	3.41	.59
Computer-mediated communication is more impersonal than audio teleconference discussions.	109	3.36	.67
Messages in the online course were impersonal.	109	2.51	.91

Scale: 5 = *strongly agree*, 4 = *agree*, 3 = *uncertain*, 2 = *disagree*, and 1 = *strongly disagree*.

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Table 3. Descriptive Statistics for Student's Satisfaction with eLearning Courses

Items	N	M	SD
I am satisfied with this program.	109	4.54	.58
Distance education is worth my time.	109	4.23	.62
I enjoy studying by distance.	109	4.09	.66
Distance education is stimulating.	109	3.67	.73
Distance education is exciting.	109	3.56	.84
I look forward to learning by distance.	109	3.42	.75
I prefer distance education.	109	3.18	.79

Scale: 5 = *strongly agree*, 4 = *agree*, 3 = *uncertain*, 2 = *disagree*, and 1 = *strongly disagree*.

The third objective of the study sought to describe student's satisfaction in eLearning courses (see Table 3). The items that earned the highest scores were "I am satisfied with this program" ($M = 4.54$, $SD = .58$), "distance education is worth my time" ($M = 4.23$, $SD = .62$), and "I enjoy studying by distance" ($M = 4.09$, $SD = .66$). The item that earned the lowest score was "I prefer distance education" ($M = 3.18$, $SD = .79$). Participant demographics were not found to be significant regarding their satisfaction in distance courses. The findings of this evaluation were limited in scope and were therefore not generalizable. The results do offer insight on the variance to explain graduate eLearning student satisfaction.

Summary

The findings of this study support the application of both McClelland's Motivational Needs Theory and Social Presence Theory as presented by the researchers. McClelland (1987) hypothesized needs are developed throughout an individual's life and fall into three main areas, achievement, affiliation, and power. The resulting scores for multiple areas were consistent with the three needs: achievement, affiliation, and power.

The desire for instructor support aligned with the need for achievement. McClelland (1987) wrote those with a high need for achievement will seek to improve on tasks. A student's desire for instructor support is part of the process on improving on course tasks. The scores for interaction and collaboration with students supported McClelland's theory of need for affiliation.

The need for affiliation is typified for a desire to work together in a mutually beneficial relationship (McClelland, 1987). The desire for student autonomy sustained the need for power. A need for power is marked by a need for an individual to have the power to direct the individual or others to achieve a goal or goals (McClelland, 1987). The scores for student autonomy indicate that the student needs to maintain a certain amount of power in a distance learning course.

The students' scores also supported social presence theory. This theory evaluates the salience of

an individual's communication with other individuals and their interpersonal relationships (Short et al., 1976). Tu and McIssac (2002) wrote that three dimensions of social presence theory in distance learning environments are interactivity, social context, and online communication.

Distance learning students' scores for instructor support and student interaction and collaboration lined up with the interactivity dimensions. The interactivity dimension deals with communication styles and engaged activities (Tu and McIssac, 2002). The interaction with the instructor and fellow students supports the communication aspect of this dimension. Social context encompasses such areas as privacy, relationships, and social processes (Tu, 2001).

The scores for instructor support and student interaction and collaboration align the areas of relationships and social processes within the context of social presence theory. The scores for student autonomy follow the privacy aspect of this dimension. Walther (1992) wrote that online communication can be furthered for an individual by developing an identity and connection with online participants. The scores for student interaction and collaboration support the connection aspect of this dimension while student autonomy scores support the identity development aspect.

Future research should address the relationships between the variables discussed in this study in order to improve and streamline the eLearning framework. Research should be designed to determine if an increase social presence in eLearning environments leads to an increase in student satisfaction. The increasing use of eLearning environments in agricultural education implies that instructors will need to be cognizant of the effects of social presence on student satisfaction. Instructors in eLearning environments must utilize appropriate methods at their disposal to increase student satisfaction.

Future practice should include an emphasis on the constructs that received higher student scores. Instructor involvement in the eLearning environment received high scores from students in terms of student satisfaction. Instructors should ensure that they are available for student support and interaction. Students also derived satisfaction from collaborating with other students. Instructors in eLearning courses should seek to ensure and increase student collaboration and interaction. An eLearning course with an emphasis on these aspects should achieve a significant degree of student satisfaction. The results of this study offer agricultural faculty an idea of what drives student satisfaction in an eLearning environment. The information gathered from this study can help in

creating eLearning environments that support learning through student satisfaction.

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NACTA 1972¹

J. Wayland Bennett

NACTA Journal September 1972

Today ushers in the last few moments of the brief time span in which I will have the privilege of serving as your President. It has been a busy year, an eventful year, and a year that re-emphasized to me the tremendous responsibilities facing higher education in agriculture and the awesome task facing NACTA as it plans for the future. There is so much to do that it is often hard to determine where to begin. But there is one overriding conclusion that I have reached at the end of my year of service – that is, that the membership of NACTA is composed of innovative, ingenious, and dedicated professional educators willing to take on any task; the odds are favorable that they will wonderfully succeed. NACTA 1972 is reaching maturity; its growth, and its future can be what its membership wants it to be.

Let me assure you at this time that I have neither an extremely long address nor an address that would be classified as one of strict educational philosophy. Instead I want to visit with you about the current status of NACTA. We started this year with an outstanding convention on “Teaching Agriculture in an Ecology-Conscious World”, hosted by Northeastern Junior College in Sterling, Colorado. The Journal continues to improve in quantity and quality, we enjoyed another year of having the treasury in the black, a slight increase in memberships, and a considerable amount of hard work on the part of the standing committees and officers of NACTA.

Recently in preparation for this occasion, I reviewed the entire collection of NACTA Journals, giving special attention to the speeches of the retiring Presidents, searching for some clues relative to their thinking as they concluded their terms of office. I must in all candor relate to you that I could not compete with the former Presidents in selecting a speech title that would be, in a Madison Avenue context, both “catchy” and at the same time set the tone of my address. Thus, the decision to simply visit with you about NACTA 1972.

Franklin Eldridge, in his address as outgoing President in 1969, stated that his review of the speeches of former Presidents, as they came into office and as they left, indicated “high aspirations as the person took over the reins of the office, but by the end of the year a note of frustration was there.” Certainly during the past year I have been both encouraged and discouraged with certain aspects of progress made by NACTA. But the very fact that NACTA has now concluded its seventeenth year indicates that there is a need for this organization and that the scope and breadth of its

responsibilities to higher education in agriculture will increase in the future.

In my opinion, the future development of NACTA is a challenging one. The development programs needed in the 1970’s will be different from those of the 1960’s and must be approached differently. No longer is the fight one only of educational acceptance coupled with the struggles of youth, our energies must be channeled into the increased diversification of membership. Increased members must be secured from the Land-Grant Universities, from the other four year degree granting institutions, and especially from the increasing number of two-year community and technical schools.

The “old guard” that labored long and hard in the vineyards of NACTA has reached or in many instances is approaching retirement. The future development of NACTA depends on how well we can recruit from among the younger groups of “super-stars” that are replacing the departing established stars. These people have a desire to achieve and they have ability but many are not fully aware of previous battles fought and won, nor, of the progress made by NACTA in seventeen short years. They inherit a solid foundation on which to build and it should be a challenge to them and to the older members of NACTA to see that the new guard builds realistically and with a dedication of purpose that will increase NACTA’s educational responsibilities and acceptability.

As President of NACTA this year, I was invited to and participated in the annual Summer Conference of the Deans and Directors of Resident Instruction of the State Universities and Land-Grant Colleges. This conference was held at Branson, Missouri, in August 1971.

In November, I represented NACTA at the 85th Annual Convention of the National Association of State Universities and Land-Grant Colleges held in New Orleans. O. J. Burger, Western Regional Director of NACTA was in attendance and also represented our organization.

In March of this year, I attended the Thirteenth National Convention of the Honor Society of Delta Tau Alpha held on the campus of Sam Houston State University at Huntsville, Texas. I had the privilege of addressing this group of outstanding young men and of participating in and representing NACTA (their parent organization) at the Awards Night Banquet.

Then in April, I participated, at the invitation of Don Marshall, Director of Resident Instruction at the University of Idaho, and Rod Bertramson, Director of Resident Instruction at Washington State University, in the annual Spring meeting of the Western Section of the Deans and Directors of Resident Instruction. O. J. Burger also attended this meeting as a representa-

tive of NACTA.

I am deeply appreciative of the honor extended to me during the year to serve NACTA as its President and through this office to have had the opportunity to represent our organization at the above professional meetings.

No professional organization is any stronger than the executive and committee structure that determines its policies, guides its course and initiates and carries out its day to day operations. As your President, I had the opportunity to observe a large number of busy, efficient, and extremely capable individuals perform numerous functions for NACTA with dedication and pride. I want to personally acknowledge the many good works performed during this year by all of those who contributed in any way to furthering the ideas and purposes of NACTA.

In this context I wish to give special recognition to Gordon Stewart, our Treasurer, for the outstanding job he has done over the years in performing the duties of this office. To John Wright, a special salute, for continued improvement in the overall quantity and quality of the Journal. The Journal is our “show window” to the general public and it is the responsibility of every NACTA member to work to make it better in the future. Bill Stopper has served NACTA in many different capacities and continues to be a pillar of support of the organization. Darrel Metcalfe, as Immediate Past President, was always more than willing to take time to discuss a problem and give of his counsel.

The Regional Directors, Robert McGuire, F. C. McCain, O. J. Burger, and Frank Carpenter worked many long hours for the cause of NACTA. Although, many of the Past Presidents might wish to argue with me about the dedication, quality, and attention to duty of their Regional Directors, these four men, in my opinion, formed the best set of Directors any President ever served with. Gentlemen, for your outstanding service may I publicly extend to each of you a “tip of my Texas sombrero”.

I would be remiss if I did not mention the service to NACTA performed during the year by the members of the various committees. Results are sometimes hard to measure, but we can all appreciate the fine work performed by the Journal Editorial Committee under John Wright’s leadership and ably assisted by Jack Everly. Grant Moody and his committee again made the Teacher Improvement and Recognition Committee a viable one. The E. B. Knight Journal Award Committee with Jack Everly at the helm had a wealth of fine articles to consider this year. Ruff Gentry in his work with Delta Tau Alpha, Wayne Kroutil as Chairman of the Committee on International Programs in Agriculture and Murray

¹ Presidential address by J. Wayland Bennett at the 18th Annual Convention of NACTA held on the campus of Middle Tennessee State University, Murfreesboro, Tennessee, June 14, 1972.

Brown as Chairman of the Enrollment Data Committee helped make this a successful year for NACTA. To all of those who worked on these committees, NACTA gives you special recognition.

In his address last year, President Darrel Metcalfe advised that a review of NACTA's standing committees and the involvement of more people in the committee structure be undertaken. This advice, in my opinion had merit, and was followed where applicable. The Advisory Committee, the Public Relations and Planning Committee, and the Committee to establish a National Office were abolished. For the 1971-72 NACTA year there were eight standing committees, with 47 members. Of these 47 members, 24 were first time appointees.

I would recommend that the standing committee structure be reviewed again for next year and that the diversity of appointments to the committees be continued in order to involve more people from all types of educational institutions encompassed by NACTA. In this context as we look to the future and expand our membership and activities, the appointment of a part-time Executive Secretary should be seriously considered. At present, special situations can still be handled, as needed, by Ad Hoc Committees.

NACTA is dedicated to the improvement of college teaching of agriculture. It has not swerved from its original purpose since the constitution was drafted in April 1955 on the campus of Central Missouri State College at Warrensburg, Mo.

The three purposes of this organization:

1. To provide for all institutions a forum for discussion of questions and problems related to improvement of college level instruction in agriculture.
2. To seek to improve higher education in agriculture through examination and discussion of curricula, course organization, teaching techniques, facilities and materials.
3. To encourage and promote the general availability of instruction in agriculture and research supporting this instruction.

These purposes are as valid today as they were 17 years ago. In fact, numerous developments in some areas of higher education during the last decade appear to have had their beginnings because of the existence of less than adequate teaching, in some areas. NACTA can be proud that its primary objectives stress good teaching,

improvement in teaching and honoring outstanding teachers.

It is a sustained concern with me that our successes of the past, our current developments, and NACTA's future achievements will result in a philosophy of excellence in teaching that will expand beyond the academic discipline of agriculture and eventually encompass all disciplines of higher education. You have laid a sound foundation for carrying this message to other disciplines; let's all put our efforts and thoughts to the task of making NACTA an educational force that won't be satisfied until all students receive the best education that we with our vast resources are capable of providing for them.

As I mentioned earlier I had the privilege of representing NACTA at the Thirteenth Annual Convention of Delta Tau Alpha held on the campus of Sam Houston State University in March. Ruff Gentry of Fort Hays Kansas State College is serving as National Advisor and William E. Meyer of Southeast Missouri State College is serving as National Executive Secretary and are also on the Liaison Committee of NACTA with Delta Tau Alpha. For the year 1971-72 Basil Julian, of Fort Hays Kansas State College served as Delta Tau Alpha's National President. His successor is Kenneth Banks of Southwest Texas State University. Both of these young men are fine leaders of whom we are justly proud. The Corbus Award again was won by the chapter at Sam Houston State University.

Delta Tau Alpha has grown in its short history to a total of 23 chapters. For those of you that do not have a national agriculture honor society at your institution I recommend Delta Tau Alpha to you. I am sure that Ruff Gentry would be most happy to furnish you with all the information you need on how to charter a Delta Tau Alpha Chapter.

The Teacher Recognition and Evaluation Committee recommended, and the Executive Council approved the recommendation, that the name be changed to Teacher Improvement and Recognition Committee. This is one of our most active standing committees and is extremely vital in fulfilling our objectives.

The Committee sponsored an IOTA Workshop on the Arizona State University campus in February that was attended by 25 to 30 individuals. Reports from the Workshop indicate progress is being made in developing and refining an instrument for measuring teacher improvement and

teaching competence.

The members of this Committee, those who attended the workshop, as well as numerous other individuals, are to be congratulated for their efforts to quantify themselves to assess teacher competency. Last year one of the suggestions for the General Theme of this year's NACTA Convention was that we hold a joint NACTA-RICOP IOTA workshop or if this were not practical, that we have a NACTA-IOTA Workshop in place of the regular NACTA Convention. The Executive Committee considered these suggestions at its October 1, 1971, business meeting and recommended that the 1972 Annual Convention follow the present program format rather than be scheduled as an IOTA Workshop. The rationale for this decision was based on several factors including information gathered at the annual Deans and Directors of Resident Instruction Workshop held at Branson, Missouri. At this meeting it was ascertained that the proposed NACTA-RICOP IOTA Workshop had been discussed at each of the sectional meetings held in the Spring and again at Branson with the recommendation that they continue their annual workshops in the same manner as in the past rather than join with NACTA in an IOTA Workshop. This decision, coupled with the time factor required to complete a workshop, and the estimated cost factor of an IOTA Workshop for NACTA alone were the dominant factors considered by the Executive Committee in arriving at its decision not to have a combination NACTA Convention-IOTA Workshop this year.

In conclusion, I ask you to dedicate yourself to the furtherance of the ideals of NACTA and to become more involved in its programs and activities. Help solicit articles for the Journal from your colleagues. Give thought to future program needs, explore your own ideas and make these known to the planning committee. I can assure you that your suggestions will be welcome.

The future is an unknown, but you can help give guidance to NACTA as it builds for the future. Be proud to be a member! Actively recruit new members; nothing will help the growth of NACTA any more than an increase of active old members in getting new participating members.

It was a pleasure to serve you as your President this year.

TRANSITION IN HIGHER EDUCATION IN AGRICULTURE*

T. J. Horne

The green revolution has had a profound influence on the social and economic systems of nations around the world. Yield increases from 200 to 600 percent have been demonstrated in Pakistan and India and have triggered an agricultural revolution

*Presentation by T. J. Horne, Project Director of Agricultural Science, Southern Regional Education Board (SREB), Atlanta, Georgia, at National Association College Teachers of Agriculture, Murfreesboro, Tennessee, June 14, 1972.

of fantastic proportions. These changes have demoted some farmers from tenants to laborers as the landlords took over the more profitable farm operations. Some laborers were replaced by mechanization. The gap between the lower and upper economic classes widens. Increased production means lower prices. Nations with shortages of grains may become nations of surpluses. Changes in resource use have to be made. Displaced workers are forming dissident groups.

As you have seen in America and as you are now seeing in these nations of the world the agricultural technologist is an engineer of social change. In the past these changes created by agriculture have been allowed to run an uncharted course to their destination. This can no longer be allowed, for as agriculturists we have a responsibility for assisting in planning an orderly transition for people whose lives are disrupted by agricultural progress.

Production and People Oriented Programs

As great as the changes of the past have been we are entering a period of unprecedented agricultural transition from a production oriented agriculture to a combination production-people oriented agriculture. This change will make a deep seated, permanent impact on the face of this nation and it will have a significant effect upon every college of agriculture in America.

Even though we have won some major battles in the war on hunger, the war itself is far from over. Our researchers are winning but final victory will be difficult and will be achieved in the distant future. Ultimate victory will require continuously increasing support for research and program development over a long period of time.

While agriculture is gaining strength in production we are at the same time faced with other opportunities of increasing magnitude during this decade. Our affluent and increasingly enlightened society is imposing the mission of development of people oriented programs upon us. Today's concern is with the total economic, social and natural environment or if you prefer the setting in which people live, work and seek their recreation. The development of programs to effectively serve these needs is the challenging opportunity this transition brings you.

Agricultural Transition Brings Opportunities

Where in the past you have been primarily concerned with production agriculture you will now be concerned with the broad interests of rural and urban America. The needs of these groups are more easily determined today because we are becoming more sophisticated in our collection and use of knowledge in program planning.

Some of these opportunities which will have major impacts on your programs are in the areas of: constraints on natural resources likely to be imposed on producers and users of land and water; achievement of a balanced growth which allows rural America to share meaningfully in the nation's economic expansion; development of a healthful environment in which people can live, work and play; new systems of crop and livestock production with emphasis on biological insect, disease and weed control, as an example: a closer coordination between colleges of agriculture and off-farm businesses and industries in conducting programs of pre-service and continuing education for careers in agriculture; new and innovative marketing systems for agricultural products; expanded credit programs for agriculture; plant and animal nutrition and health protection; agriculture's role in urban planning and development; coordination and cooperation of colleges of agriculture, for example, development of regional programs; interpreting the significance of agriculture's mission to the total public.

These and other problems which present us with our opportunities will call on our best brains and manpower to develop solutions. As you can see, these concerns relate to attitudes of urban and rural people, to research and technological approaches that need to be pushed now to solve tomorrow's needs, and to programs development which needs to be inaugurated now to supply educated manpower for leadership roles in the newly developing agriculture.

Students currently enrolled in your colleges of agriculture will be our agricultural leaders of the 1980's. Give them experiences in relevant programs involved in the emerging opportunities created by the current transition to people oriented programs in agriculture. Such programs will call for all the abilities, constructive imagination and energy that we can muster and the effective involvement of our students in experiential learning will be vital.

Transition Requires New Programs of Education

As we examine the opportunities which transition brings we can only imagine what wonders may lie ahead for agriculture. The current rate of change in agricultural science has become so explosive that changes can occur much earlier than expected. In this light then, we must move now in developing entirely new programs of education in agriculture. To achieve a desirable degree of success we will need to take a "systems approach" to their development. Narrowly specialized degrees and those curricula pulling together isolated bits and pieces of technical data, as provided in too many departmental programs of study at the undergraduate level, will not suffice for educating leaders to serve the agricultural needs of the people in the future. Effective programs will require a combined team effort of many interrelated disciplines. Transition is now providing us with a major opportunity to develop programs of instruction capitalizing on the effective use of educational technology applied to the student's capacities during the learning process.

The recent coordinated and cooperative efforts of the land-grant colleges of the 14 Southern states to effectively develop foundation courses in agricultural sciences for all students in agriculture, regardless of their areas of specialization, serves as an example of the team approach required in the development of program requirements brought about by the transition to people oriented programs in agricultural sciences.

The Need for Foundation Courses

During the mid '60's the deans and directors of resident instruction of the land grant colleges of agriculture of the Southern region, realizing that colleges of agriculture were approaching a period of transition, reached the decision that one of their most pressing needs would be the development of courses in the areas essential to an effective education in agriculture. They agreed that foundation courses in the areas of animal science, plant science, socio-economic science and agricultural mechanization, all incorporating the essential principles and application of other sciences, would provide a good beginning in agriculture for any student regardless of his area of specialization or his career orientation.

As the volume of research data multiplies and careers in agriculture become more people oriented the offering of introductory courses in each subject-matter area is no longer possible in the curricula of our colleges of agriculture. The expansion of agriculture in our Junior College system focused attention on the need for foundation courses which would more adequately prepare students for transfer to the upper division levels in our senior colleges and universities. Few of our universities have the expertise, resources and financial support necessary to develop the kind of courses and teaching-learning materials needed for efficient instruction in such courses. Even though it is generally recognized that instruction in agriculture is as good or better than in any similar division of the University system we are constantly striving to improve our teaching-learning. While agriculture provides an excellent opportunity for the use of audio, visual, other sensory and live materials, it is apparent that many educational media and technologies are not being used effectively in teaching agricultural science courses. For these and other reasons the development of Foundation Courses in Agricultural Sciences were undertaken.

Early Efforts of the Regional Committee

A committee consisting of Neal Peacock, Randall Jones, Robert Wheeler and Stanley Wall was appointed to develop a proposal to obtain funds to support the development of these courses. After several disappointing attempts to obtain funds for the project the committee turned to SREB for assistance in developing the courses.

In 1969 Robert Wheeler met with the SREB Council of Higher Education in the Agricultural Sciences to explain the project and ask their support in carrying it out. At that time they endorsed the project and agreed that SREB should assist with its implementation as it fitted into the program of agricultural sciences of the land grant college project of the region supported by

the W. K. Kellogg Foundation. Progress has been slow because we had to develop the procedure for such an effort and launching a project conservatively estimated to cost over a million dollars with no staff and no specific budget is to say the least a little difficult.

General Situation Concerning College Teaching

Early in 1969 a review of the situation in the region indicated that traditional college teaching, placing the primary responsibility for learning upon the student, had been in vogue in the region because of a number of reasons – some of the primary ones were:

1. College teachers lacked an understanding of learning theory. Faculties were drawn from research oriented rather than teacher oriented programs, therefore, they had little understanding of learning theory, teaching methodology or technology of instruction.
2. Graduates tended to emulate their teachers. Because they came through research oriented environments in which teaching was frequently considered an extra burden they had a limited perception of their role as college teachers. They considered themselves primarily as dispensers of knowledge. This served as a basis for the philosophy which placed the responsibility for learning on the student.
3. Colleges provided little education for prospective faculty members in providing them with learning experiences designed to maximize learning in individual students with different abilities and aptitudes. Colleges vocalized a concern but practices were concentrated on educating masses of students with emphasis on process rather than the product.
4. Teachers used the normal curve as the basis for awarding students final grades. This process pitted student against student rather than measuring their progress towards achieving their defined educational objectives in their courses of study.

As a result of these and other factors existing in the region we concluded that opportunities to enhance learning and education of college students have been neglected because administrators and their faculties have not made the real organized effort needed to provide the "software" required in providing effective programs of education in our colleges.

A Systems Approach to Learning

After working with the project for a short period of time we decided that the foundation courses should contribute to speeding agricultural transition and make a meaningful impact on effective education in agriculture in the region. To do this we decided to change the program of instruction and educate teachers to use the new technologies and developed material effectively.

Today's educational technology indicates that programs designed to increase instructional effectiveness are built around a systems approach to decision making. To me, an "Instructional System" is a comprehensive set of learning media (including objectives, subject matter content, curriculum materials, methods and strategies of instruction, learning aids and devices, and student selection and evaluation processes), facilities and equipment, and instruction personnel integrated into a systematically organized teaching-learning process. Such a systems approach has the potential of permitting and facilitating management of the total learning environment.

Implementation of this concept requires the teacher to make the transition from lecturer or dispenser of information to a new role of director of learning. Filling the role of director of learning requires the faculty member to:

1. Write out instructional objectives in behavioral (measurable) terms.
2. Pre-determine learner capabilities in the subject content.
3. Identify and clearly define the techniques to be used to advance the learner from his current level of capability to the desired terminal behavior (performance) level.
4. Prepare relevant measures for post evaluation.

Each of these steps in a systems approach to instruction is

equally important and essential in placing the teacher in a role of accountability. If the teacher is to be held accountable for the failures as well as the success of his students, these steps must become part of the system of instruction. Such a process moves the teacher into the role of manager of the total learning situation and out of the minimum role of information dispenser. Placing the responsibility for causing learning on the teacher retains the student as an active participant in learning. It requires the teacher to consider and plan for variables in the learning process (individual differences in aptitude, ability, performance levels, and motivation of students). It is through such individualization built around clearly defined behavioral objectives supported by valid approaches to measurement of individual student progress that the concept of accountability becomes meaningful.

Procedures Followed in a Regional Approach to the Development of Foundation Courses

In accordance with these concepts of a systems approach to teaching-learning we proceeded to implement their application in the development of foundation courses in the agricultural sciences as follows:

1. Worked with the committee of deans and decided to use a task force team of specialists in discipline areas to develop each course.
2. Requested deans of the land-grant colleges in the region to nominate members for the task forces whom they were willing to release from their regular college assignments for the time required to develop the course content.
3. Task force teams were selected by SREB from the nominees submitted. Each member was notified of his selection and asked to prepare an outline of the content for the course, using the personnel and resources available at this college.
4. Called the task force team together to consolidate ideas and develop preliminary course outline. Designated a task force team chairman and each member forwarded revisions of the outline to the chairman for consolidation and distribution to the team members.
5. Each task force team member selected sections of the course content for which he would develop the teaching-learning materials. Each member was then asked to select a unit of material that he would normally cover in a one to two hour lecture and prepare all the materials he would need in teaching this unit using his conventional means of teaching. In addition they were asked to study references on preparing instructional objectives.
6. The task force team was then brought together to work with consultants for a three day workshop. They each brought all the material they had developed on the one unit and with each task force member using their own materials in the workshop were led through the steps in developing an individualized teaching-learning packet. This gave them the procedure, techniques, and confidence required to continue developing packets of materials.
7. During the summer the task force teams were called together for a two week period to review their work to date, coordinate efforts and continue the development of packets. A consultant and a dean designated as task force advisor meets with the task force as needed during the work period. Each member of the team is provided with copies of all packets of materials developed for the course.
8. The task force team members reproduce and try out the packets with their classes during the academic year. They gather student reactions, performance data and suggested revisions for each packet of material. They continuously revise, improve and update the material.
9. During the summer following the try-outs the task

force team is brought together again to revise and update the packets on the basis of their combined experiences and student inputs.

10. Following this revision we make the courses available to other land grant colleges who want to use them in their classes. Before these faculty members are given the materials they are required to go through a three day workshop following the step-by-step procedure in developing a packet and using it in teaching-learning. In following this procedure each user becomes an involved participant in the further development and improvement of the course materials.
11. This year we are inaugurating the finishing step in the development process. Each participating faculty member is being asked to select one or two packets of material for further development during the year. He will concentrate on these packets to develop the best teaching materials he is capable of devising to assist students in effectively achieving the performance standards set in the objectives for the packet. By concentrating on one or two packets and using the resources of his university in preparing the best materials they are capable of developing and forwarding these to a regional center for reproduction and distribution we can have the best teaching-learning materials ever developed for a single course. This procedure imposes no burden on any one faculty member or university in developing materials, yet makes the best of all of them available to teachers and students in the region.
This process can have a tremendous effect upon the program of instruction in the colleges of agriculture and can influence the university's approach to learning as we involve faculty members in the systems approach. College of agriculture faculty members are suddenly finding themselves in positions of leadership in their universities as they move to a systems approach in learning.

The Project Director's Role

Our office serves as catalyst in the development of these courses. We have provided leadership, coordination and modest financial support for the development, revision, duplication and distribution of materials. Someone has to be in a position to devote time and effort to initiating and following up such coordinated team efforts. Such a person needs to be in a position to obtain administrative support from the participating colleges, make decisions and provide modest support for the task force teams.

NACTA Journal September 1972

In Summary

Agriculture is in a major transition in which changes will develop rapidly. Use of a systems approach in planning for many of the opportunities which the transition will bring will be essential. Such a system applied to teaching-learning can use all known educational technologies in capitalizing on the use of the 5 senses (seeing, feeling, tasting, smelling and hearing) of students in learning. It is limited only by the imagination, initiative and resources of the participants. Students can and do contribute to developing and improving learning materials. We are finding that use of the individualized systems approach allows the teacher time to do what he can do best in helping students learn, namely:

1. Diagnose learning difficulties.
2. Interact with students on 1-1 basis or in small groups.
3. Inspire and motivate.
4. Identify and encourage creativity and self-direction.

A systems approach to teaching-learning is quite a departure from the procedure of hiring a faculty member in late summer and telling him that he will teach the course in the fall term and will have to develop the content and carry on the other duties of his job simultaneously.

The example I have given you represents a type and scope of the kinds and magnitude of transitions that you can expect to make during the '70's if you are to effectively prepare students for careers that are being created by the production-people-oriented programs in agriculture.

Transition in Higher Education in Agriculture will occur at an increasingly rapid tempo. Many of the careers of today will not be available in the '80's, therefore, the speed with which you make transitions will determine in large measure those programs which will be effectively educating agriculturists for the next decade.

The opportunities provided by transition to people oriented programs in agriculture are so great that they will require cooperation of institutions, private organizations, businesses and industries, governmental agencies at all levels, rural and urban peoples.

As we begin to make changes towards a people oriented agriculture it is obvious that we need imaginative and creative people. Agriculture will need the best people it can get in rural development, off-farm segments, governmental organizations and agencies, institutions, urban planning and development, consumer interest related to food and fiber and environmental quality. Colleges of agriculture are the chief sources of supply.

There is little doubt that this decade will be full of excitement. We are committed to service a great American public. As Earl L. Butz, Secretary of Agriculture, recently said in a meeting in Atlanta, "Our greatest challenge — our greatest need — our greatest opportunity of all — will be to develop people who can carry forward the mission of agriculture and rural America triumphantly."

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Metaphors in Agroecology Education: One Personal Method of Learning

Metaphor: the application of a word or phrase to an object or concept; it does not literally denote in order to suggest comparison.

Among multiple methods of learning, personal metaphors created by students while walking the farm and rural landscape and while working on farms have been particularly useful in establishing identity with the context of farming and food systems. In the literature on metaphors and learning, there is frequent reference to the dominance of traditional “teaching and learning” by transmission of knowledge, while much less common is an appreciation of learning as a social process (Martinez et al., 2001). Educators in Finland refer to these two models as an “acquisition metaphor” and as a “participatory metaphor” (Paavola et al., 2003). They add a third metaphor that relates quite directly to our approach in the Agroecology MSc programme, that of “knowledge creation”. It is within this third arena that we have assigned students to create their own metaphors while walking the landscape and exploring new places in the farm and rural community context. Some revealing examples are presented below.

Learning objectives are to 1) encourage students to observe carefully the physical landscape and especially its biological elements, 2) provide opportunity for personal identity with these elements in ways that are uniquely appealing so that they will dig more deeply into their own learning, and 3) offer safe space to present and discuss these individual metaphors within the immediate learning community as well as listen to others’ creative ideas. We have successfully included this dimension with the initial transect walks across the farm and the rural landscape in several short workshops as well as in semester-long immersion courses in agroecology.

Methods for the discovery of personal metaphors are rather simple. We ask students or workshop participants to be alert observers as they traverse the landscape, and while they are soaking in the sounds, sights, smells, and feel of the experience to seek some element with which they have a particularly personal identity. This could be a plant, an animal, or a specific

feature of the place. We ask them to remember that feeling, and to share it with the group when we reassemble, but only if they are comfortable doing so. Although we often use this exercise early in the schedule of a course or workshop, it is encouraging to observe the level of trust and confidence in the group that has often been built in a very short time, and this is related to other activities in community building [see Building a Social Learning Community, NACTA Journal, September 2011, page 99] and the abilities of the instructors to create safe space and an affirmation of individuals for their previous experiences and qualities that are brought to the group.

Outcomes of the exercise have been observed in a number of workshops and classes, but to date have not been adequately assessed in a systematic way. Probably the best indication of outcomes is to provide a number of specific metaphors that students created from the activity, several of them in a workshop on nutrient cycling in Tingvall, Sweden in a 2003 course.

As an agroecologist and sustainable agriculture advocate in my department, even among the grad students, I feel like that one brown and white cow in the herd of Holsteins that we visited; it seems like everyone must be looking at me.

I feel like that clump of perennial grass that is prominent in the pasture we walked through, with deep roots that go down into the soil and the history of Sweden, just as my own ancestors belong to this land.

When I walked by the dairy barn there were several swifts that flew out from their nests and then swirled around above me in the air; it seemed like I would like to be wild and free and be able to sail around like that and observe things from above.

Over by the milking barn there is a large manure lagoon above ground ... you have all seen it ... that is about 3 meters deep and 20 meters in diameter. On top there is a green scum or crust, and several small birds carefully walking around and picking up insects from this rich medium. When I am in my department back on campus, I feel like those birds – there is useful stuff here to harvest, but any mis-step or reference to sustainability could send me into deep manure with my professors and colleagues.

These are exciting and even visceral types of identity with living entities in the environment on a dairy farm. They probe individual feelings and encourage a

type of learning about oneself as a component of the landscape and its activities that would be inaccessible in a classroom, and highly unlikely on a field trip that turns into a lecture on cropping systems by the instructor or a farmer. We consider this a valuable stimulation for learning in agroecology.

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Submitted by:

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Changing Lives in a Semester: A Teaching Approach to Help with Tenure and Promotion While Providing an Experience They'll Never Forget.

Do all university courses have to be structured in a traditional way? For many, the answer is a resounding, NO! Generally, we assume a course needs to have a midterm, final and at least one major project. Although this may fit well with many standard courses, it can be a wonderful experience to deviate away from the norm and delve into the world of service learning.

As an extension specialist in sustainable communities, I was asked to teach sustainable living at our university last semester. This was a course with a previous lecture format of planned presentations, five quizzes, a major research project and various smaller assignments. This was a solid foundational structure, but why not tear it apart and try to implement lasting pro environmental change on campus within a semester? That became my goal as I restructured the class. (See syllabus examples in Figures 1 and 2.) To summarize, the new course with 32 enrolled appeared as follows:

1. Students selected an area on campus to conduct a sustainability audit and submitted letters to the deans/facilities staff/administrative staff regarding

Figures 1 and 2. Pages from Sustainable Living syllabus

Teaching Tips/Notes

their observations and specific recommendations for improvement.

2. Students selected environmental topics of top interest to them, merged themselves into groups, and worked all semester to try to see their pro environmental change come to fruition on campus. This was done using Community-Based Social Marketing Techniques and working closely with key campus stakeholders. Topics ranged from using a reusable bottle or mug to buying local food.

3. The major assignment for the semester evolved from class discussion, and became the first annual campus Earth Week with a focus on land, air, water, food and a finale covering all topics at a student-organized sustainability fair.

4. A midterm was administered for content retention, but instead of a final exam, students submitted a fact sheet based on the environmental topic they had studied all semester. In co-authoring the fact sheets, this assists directly with tenure and promotion given the outreach expectations of extension faculty.

Unexpected Outcomes

1. Prompted by the student letters, dining services formed a sustainability group and have already begun working on better recycling habits, composting, and offering reusable “to-stay” cups in campus cafes.

2. Over 5,000 students participated in Earth Week, with over 1,000 signing various pro-environmental pledges.

3. In conducting a student life skill assessment in the class, significant changes occurred on all levels ($p = 0.001$ or smaller) at a 95% confidence level. This included not only expected skills gained in communication and marketing techniques which were a large focus of the class, but also in applying sustainability strategies in the workplace, general public speaking skills in other classes, working in groups, negotiation, dealing with difficult people, and overall self-confidence.

4. Students evaluated the course on all goals and items “higher” than all classes across campus, and rated it as “much higher” in learning to apply course material to improve thinking, problem solving and decisions.

5. Student evaluation comments following the semester demonstrated the course impact, as is demonstrated in the following selected quotes: *“This course was the most useful course I have ever taken in my four years as an undergrad and one year as a grad student...I walked away from [the course] feeling as though I had made a difference in my own life, on campus, and in my career.”* *“I love!!!! That this was*

a hands-on learning class. I really learned more than just the subject. It was indescribable how this class changed me and my future.”

Tips for success

1. Collaborate with multiple stakeholders who can make change happen on campus. This fosters a sense of responsibility in students, but also ensures they will see results from their hard work.

2. Consider your tenure and promotion expectations. Can you find a good balance between students building their resumes and you checking off required tasks?

3. Demonstrate to students how to add publications and event planning from the class into their resumes. This helps them see the “so what” of their efforts.

4. Be flexible. Students – not the professor – designed the major assignment of Earth Week.

5. And lastly, but of most importance, show your enthusiasm for the subject matter and faith in their ability to succeed.

Remember, life change can happen in a semester!

Submitted by:

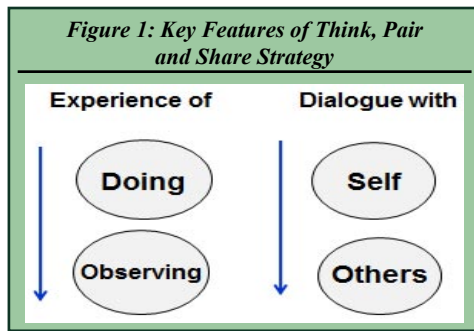
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TPS (Think, Pair and Share) as an Active Learning Strategy

Today’s classroom teachers are challenged to make students think, provide experiences that help them learn and understand the concepts that are being taught, and provide opportunities to do, think and reflect. Active learning (AL) is one such strategy that engages students in two aspects – doing things and thinking about the things they are doing (Bonwell and Eison, 1991). Active learning includes an array of teaching activities that range from simple question and answer sessions to complex practicum and research involvement. Research has shown that AL is an effective teaching technique that allows students to learn more with the help of the instructor and other students. As shown in Figure 1, providing students with opportunities to experience what they are doing, observe what others do and have a conversation/dialogue with others and themselves will help them to critically think and apply concepts taught in class to real life situations.



Think, Pair, and Share – TPS is an AL strategy that can be used in any classroom format which gives students time to think on a topic, turn to their neighbor for a short discussion and share the results of the discussion to the rest of the class. The purpose of this “Teaching Tip” article was to describe the use of TPS in a senior level undergraduate research methods class and evaluate the effectiveness of TPS in enhancing student learning. TPS involved three steps. Step 1 (THINK) – in this step, students were asked to define a concept or term in the context of their research study. For example, validity and reliability as concepts in a research study. Then, they were asked to think about its meaning and write down its use in conducting a research study. In Step 2 (PAIR) – students were asked to discuss with the individual sitting next to him or her about the terms and concepts identified in step 1. The rationale in step 2 is to not only understand the concepts from each student’s point of view but also learn from each other. Step 3 (SHARE) involved sharing of the experience of learning the concept with the rest of the class. The rationale in step 3 is to understand the term or concept from a variety of perspectives. A total of 15 minutes are needed to complete the three steps. TPS was used six times in a semester.

To assess the effectiveness of TPS, a simple assessment tool was developed. Students indicated that TPS was a very useful strategy (100%), increased their critical thinking (80%), was a good strategy (100%), and recommend use of TPS strategy in other classes (100%). Further, students were also asked, at the end of the semester, to rate the effectiveness of TPS as an AL strategy on a five-point scale that ranged from 1 (strongly disagree) to 5 (strongly agree). The statement, “TPS helped students to know how knowledgeable their peers were relative to a specific research term or concept” received the highest mean rating (4.62), followed by “opportunities to pair with a fellow student to discuss concepts” (4.5), served as a good reinforcing tool for concepts learned in class (4.5), increased critical thinking of research concepts (4.3), and cleared doubts on concepts learned in class (4.3). Further, over 70% of the students indicated that

TPS should be continued, more so in undergraduate courses. Overall, students agreed that TPS is a good active learning strategy to understand concepts before they are taught, get to know students and where they are relative to the concepts. The following verbatim comments support the student consensus on TPS.

“TPS strategy really helps you assess what you know *before you are taught the concept*. If everyone has a good understanding of the concept, instructors can spend less time covering and move on to things that students don’t know.”

“I think giving students the opportunity to present both broadens other students understanding and forces the presenter to verbalize and explain.”

From the instructor perspective, TPS has several advantages which include 1) helpful in organizing content and tracking students on where they are relative to the topic being discussed in class, 2) allows students to prepare for each class session, 3) saves instructor time so that he/she can move to other topics, 4) provides opportunities for students to interact with each other and 5) helps the instructor in making the class more interactive than regular lecture sessions.

In summary, TPS is a very good active learning strategy. If properly implemented, it saves instructor time, keeps students prepared, helps students to get more involved in class discussion and participation and provides for cumulative assessment of student progress. TPS is not a good strategy to use in large classes because of time and logistical constraints. Frequency of using TPS strategy should be carefully planned so that it will not take too much time. Further research is needed to link TPS strategy to test performance. Please contact the authors for sample questions and details of procedures used in TPS discussions and assessment tools used to assess the effectiveness of the TPS strategy.

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Book Reviews



How to Survive Your PhD: The Insider's Guide to Avoiding Mistakes, Choosing the Right Program, Working with Professors, and Just How a Person Actually Writes a 200-Page Paper

By Jason Karp. 2009. Sourcebooks, Inc. Naperville, IL. 224 pages. \$17.00. ISBN 978-1402226670

With the bleak job market and lackluster economy, many young adults are staying in school to pursue graduate degrees or returning to school after a layoff. To advance your career and get ahead in the competitive job market, the trick is to graduate as quickly as possible so you don't waste more time than necessary out of the job market. This is especially true for people finding themselves out of work and needing to return. How to Survive Your PhD covers many of these tricks, offering a no-nonsense approach to getting in and out of school with your PhD in hand. Here's some tips to complete your PhD quickly and not have to spend seven years getting it: 1) Choose your academic advisor carefully. Your academic advisor can make or break your PhD experience. Make sure you choose one whose research interests match yours, who gets things done quickly and efficiently, who gives you the freedom to thrive, and whose former graduate students completed their PhDs quickly. 2) Know your research interests. The sooner you can isolate exactly what you want to study, the sooner you can begin writing your dissertation. 3) Learn the formula. Dissertation writing, especially in the sciences, is a formula. If you have trouble writing, as many doctoral students do, spend some time reading other dissertations and learn the formula to make your dissertation a breeze. 4) Know what is expected of you. Ask your committee members what they want to see from you, what kinds of things you should know, and how to study. The more information you can get from them, the easier your qualifying exam and dissertation defense will be.

"I truly enjoyed reading this book. Deciding to continue your education and earn an PhD is never easy. Dr. Karp has written a book that answers all the questions and relieves the pressure to the answer "Am I doing the right thing?" It would be an asset to anyone continuing on the journey of higher education.

I look forward to further literature written by Dr. Karp." - Robyn Cohen, Island Park, NY

"This is a great book - I finished this book in only two days. The author breaks down the major parts of doctoral study and uses his own experiences to share what to do in order to be successful as well as what not to do if you want to earn a PhD. This is a timely book for me as I have submitted applications and am hoping to start on my PhD in Fall of 2010." - Ronda Davis, Greensboro, NC

"To be frank, I spent more than half of the book rolling my eyes at various passive-aggressive quips at the author's advisor and fellow students. By the end, this felt more like a book on how to blame other people when your PhD takes much longer than you expected. Which is a pity, because I think this story had good teaching potential. I can't even begin to imagine how frustrating and disheartening it would be to work on my PhD for seven years! The author could have turned that experience into something positive, by giving concrete examples of how he dealt with problems, instead of just complaining about them and then advising to avoiding them in the first place. For example, the author complains multiple times about the frustrations of Human Subjects Committees. We get it. Bureaucracy is tedious and takes a long time.

By far the most helpful parts of this book were the tips on working with your advisor, like only giving them a chapter at a time to read, or highlighting the relevant changes. I also found the chapter on writing your dissertation helpful, especially the tips on how to write a little every day. Although the list of phrases you should use was particularly horrifying. Just because everyone else in science overuses passive voice doesn't mean you should too!" - Anonymous

How to Survive your Doctorate

By Jane Matthiesen and Mario Binder. 2009. Open University Press. Columbus, OH. 208 pages. \$40.00. ISBN 978-0335234448

If you are doing, thinking about doing, or know someone who is doing a doctorate, then this is the survival kit you need. Rather than focusing on the technical side of the doctorate, this book looks at all the

other crucial skills that are part of everyday doctoral life. This candid book provides real insight into what it's like to do a doctorate and offers practical advice on: the application process; sources of financial support; motivational issues; student-supervisor relationships; departmental and university politics; publishing, conferences and networking and career strategies.

Written by recent doctoral graduates, the book also includes real examples and case studies from current doctoral students and recent graduates across a range of disciplines and universities. By demystifying the doctoral process *How to Survive Your Doctorate* prepares you for life as a doctoral student like no other book. See for yourself and be a survivor!

"I read this book after having done my PhD, and with every page I turned, I wished I had read this before (or that it had been written before). It is written to be read (what a difference to academic texts), empathically and passionately, and nails all the issues on the head. This is a real survival guide. It totally deserves the title. I especially enjoyed the parts where various students tell their stories. This emphasizes that many of the authors' points are not simply horror scenarios. These things happen, happen every day, and doctoral students throughout the country (or even world) battle with them, but go through them and become stronger for it. The book strikes a perfect balance between brutal honesty and confidence building advice. I will recommend it to any of my friends who are toying with the idea of doing a PhD. There is only one point on which I slightly disagree with the authors: I think it is useful to get involved in academic politics, at least to some extent. Yes it can be a challenging and threatening experience when you're in the middle of it, but it is a great preparation for organizational politics that come later in life." - Regina Eckert

*"The fact that Matthiesen and Binder do not mince matters makes *How to Survive Your Doctorate* so different. By incorporating their own experiences and those of their fellow doctorates the authors paint an authentic picture of what it means to be a PhD student in an academic as well as private setting. Whereas many of the current PhD guidebooks in the bookstores focus on the technical aspects, this book does not neglect the social components and difficulties of an everyday life as a PhD. Thus, the two authors know how to answer also the "unasked" questions everyone bears in their minds while struggling and truly bring up things "others don't tell you."*

Written in a fluent and refreshing manner the honesty and charm of the book make it easy to extract the main arguments. Little cartoons at the beginning of each chapter, for instance, playfully introduce the

*reader to the contents of the following. In sum *How to Survive Your Doctorate* aims at two things. First, for strugglers, it is a preparation guide which points at the virtues and difficulties of a life as PhD and, thus, eases the choice whether or not to go down this path. Second, for PhDs in the making it constitutes an useful road map - a backup for "surviving" the lean times every PhD entails."* – Anonymous

Eating Planet: Nutrition Today – a Challenge for Mankind and for the Planet

Editor Luigi Rubinelli. 2012. Barilla Center for Food & Nutrition in collaboration with WorldWatch Institute, Edizioni Ambiente, Milan, Italy. 307 pages. \$4.00 (Kindle edition). ISBN 9788866270294.

Do we really need another book on global food challenges and potential solutions? This relevant question is easy to answer after reading *Eating Planet 2012*. Although most of the data has been reported elsewhere, this new book published by the Barilla Center and WorldWatch Institute brings together fact and evaluation in a highly accessible format, supported by useful illustrations and current data on nutrition and food in today's globalized economy. Most importantly, it provides practical and specific recommendations on how to solve current dilemmas in the food arena.

Eating Planet: Nutrition Today, a Challenge for Mankind and the Planet eloquently quantifies the problems of under- and over-nutrition that plague societies, both in the industrialized and the developing world. Four main sections address issues of equity, *Food for All*; rational economic development, *Food for Sustainable Growth*; human nutrition, *Food for Health*; and contributions to society, *Food for Culture*. Infused throughout are notions of ecology, connectedness, and systems thinking about our human role as members of a complex world community. Proposed solutions are framed within the context of three current paradoxes: 1) higher level of overconsumption and obesity than undernutrition across the globe; 2) three billion head of livestock that produce over 50% of all greenhouse gas emissions; and 3) competition for agricultural production between food and biofuels. All three have impacts on the environment and agriculture and on the availability of food, and each is strongly influenced by policy decisions.

The challenges of food equity and 925 million undernourished people are related to poverty and unequal distribution of wealth, among and within nations. Growing demand for animal protein by those who can afford it and misallocation of grains to fuel

Book Reviews

production both lead to higher prices for essential food commodities. There is currently adequate food produced on a global scale, but available nutrients are reduced by 30% losses between time of crop harvest and what is discarded from the supermarket as well as the dinner table. Reducing these losses is one of the most cost-effective solutions to inadequate nutrition.

Although it is essential to pursue research and development to increase food production, such advances need to be accomplished in an economic and political framework that will improve availability of food to those most in need. Both the U.N. Declaration of Human Rights (1948) and the U.N. Brundtland report *Our Common Future* (1988) correctly identify access to food as a basic human right, but the international community has yet to effectively address this need.

Rational economic growth, considered by some an oxymoron, has become ever more complex in a globalized economy where the system appears to maximize profits for multinational corporations while ignoring nutritional needs of people. The Green Revolution provided short-term gains in countries primarily in Asia, successes quickly tempered by urgent long-term needs for sustained access by poor people to adequate food. Vulnerability of food production to climate extremes further complicates the sustainability of food supplies, and recent spikes in global commodity prices and low levels of strategic grain reserves reflect the instability of the global food system – each of these realities impacts the poor disproportionately. The recent IAASTD report from the U.N. points to redesign of the food system and new emphasis on agroecology as potential logical solutions. Promotion of local food systems and close cooperation between farmers and consumers provide some immediate solutions to the equity challenge.

A healthier overall food system, not just increased production, is seen as the key to long-term improved nutrition for everyone. Research emphasis on higher yields of calories was appropriate when lack of food energy was the compelling need, but we now understand much more about food quality and the need for nutritious food as key to solving the problem of hunger. Challenges differ among countries. From the child without enough rice in Asia, where over 60% of undernourished people reside, to the obese teenager in North America, whose diet rich in sugars and fats contributes to an emerging epidemic of diabetes and heart disease due to overconsumption of food, there is a critical obligation to focus on food quality and nutrition. Solutions for the former include more diverse diets and access to adequate food supply, and for the latter a reduced array of attractive fast foods,

less animal protein in the diet, and increased reliance on fruits and vegetables.

Globalization of economies has led to reduced diversity of foods in the human diet, as many people are attracted to the western model, and this results in erosion of the food culture as well. It is difficult to generate concern about the ecology of food as a central element of each culture if there is urgent need to find the next meal. But growing appreciation of how diverse indigenous farming systems and strong local economies can be improved by creative uses of modern technologies will open new avenues for site-specific development based on local resources and cultures. Foods and local consumption habits are important criteria for design of biodiverse farming systems, an essential and central element in promoting local economies, and a device for linking people to their immediate environment. Viewing farming as a human activity system that links culture, ecology and natural resource use to produce essential food and adequate nutrition increases the focus on food and culture in many decisions related to development. Such solutions are in stark contrast to the industrial, large-scale, highly-mechanized, one-size-fits-all paradigm.

Eating Planet provides a compendium of challenges and solutions that is unique in its breadth of focus, its organization around key themes, and its integration of production, economic, nutrition, and cultural elements of the system. Current and expanding problems are many, and the book does not minimize their importance. Yet coupled with challenges are highly positive practical examples that project improved nutrition and equitable access to food in the future. It is these potential solutions that contribute to the strength and value in the book.

Well written and accessible to the general public, the book features statements by noted personalities including Mario Monti, current Prime Minister of Italy; Raj Patel, outspoken advocate for food and environment; Carlo Petrini, founder of Slow Food; and Vandana Shiva, proponent of biodiversity and farmers' rights. Similar to other books published by organizations, this is a team effort with minimal attribution to specific authors. It is a useful and encouraging statement on positive directions for future development of food systems, and could be a valuable overview for undergraduate courses in agroecology, anthropology, food economics, nutrition, and sustainable development.

Submitted by:
Charles Francis
University of Nebraska – Lincoln

Saving Higher Education: The Integrated, Competency-Based Three-Year Bachelor's Degree Program

**By Martin J. Bradley, Robert H. Seidman and
Steven R. Painchaud. 2011. Jossey-Bass. San
Francisco, CA. 240 pages. \$40.00. ISBN: 978-
0-470-88819-3**

Colleges and universities are under pressure from the government, students, and parents to make higher education more efficient and cost-effective. Based on Southern New Hampshire University's highly successful competency-based three-year bachelor's degree program—the longest running in the country—this book provides a blueprint for creating, sustaining, and growing such a program at an institution of any type and size. The book offers a proven model that not only cuts student costs by 25%, but significantly reduces program delivery costs. The 120-credit six-semester competency-based integrated curriculum approach focuses on student learning as opposed to “seat-time,” and research shows above average academic student success.

“At last a book that answers one of higher education's most burning questions: How do we provide America a cheaper, faster undergraduate experience without cheating on the old family recipe and compromising standards? At a time when challenges of college value, quality, and mission are high on the public agenda and an unprecedented number of institutions are exploring three-year degree programs, we are provided a road map that maintains academic integrity by focusing on learning outcomes

rather than process inputs. Bravo and about time. This book will add value and inform the thinking of all stakeholders, even the most skeptical of faculty. A three-year baccalaureate aligns the academy with the needs and aspirations of the future. While enhancing effectiveness, it affords students what they want and need while meeting the national agenda for socially and economically productive citizens.” - Stephen Joel Trachtenberg, president emeritus and University Professor of Public Service, George Washington University

“This book provides a powerful model of how to redesign a university in the interests of student learning. The authors' proposed curriculum model addresses many of the fundamental dysfunctions of higher education—the fragmentation, incoherence, and unfocused activity that produces the dispiriting results of our enormous investment. They offer an evidence-based framework for reshaping our institutions to serve the goals we all wish to achieve while beginning to address the pervasive financial challenges that undermine our efforts. This book provides a vivid and stimulating analysis of how to think about and execute constructive change. Anyone concerned about the future of higher education should read it and learn from it.” - John Tagg, professor emeritus, Palomar College, and author, *The Learning Paradigm College*

“This book offers one thoughtful approach to a high-quality education at a significantly lower cost. If educators respond, students will win.”- Margaret L. Drugovich, president, Hartwick College

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<http://www.facebook.com/NACTA.teachers>

NACTA Business Meeting Minutes

June 29, 2012

University of Wisconsin, River Falls



The Business meeting was held at the end of the Friday noon luncheon. There were approximately 160 in attendance.

Jeannette Moore called the meeting to order at 12:30 p.m. She recognized first time attendees to the conference, the NACTA Executive Committee and past presidents of NACTA. She also invited all first time attendees to become involved in NACTA Committees.

Reports Presented

- Secretary/Treasurer Marilyn Parker reported approximately 150-180 NACTA memberships change in and out each year; we have a Tip Sheet on recruiting new NACTA members available to anyone; appreciation given to those Deans/Institutions that pay for NACTA memberships on their campuses each year; only a few new institutions from NACTA Judging conference (some did not pay their Institutional membership); the e-Newsletters are fewer as we would like people to go to the website for information; Teaching Award of Merit Certificates are available at any time during the year; financial records verified by CPA firm of Mayes & Waters; end of May 2012 NACTA checking account showed an ending balance of \$48,000. **Motion passed** to approve the Secretary/Treasurer's report.

- Editor Rick Parker – Manuscript numbers were up this past year; additional committee members invited to participate as Journal reviewers; Editor encouraged conference participants to take home the extra 2011 NACTA Journals available at the conference; website is continually expanding and any who would like to contribute, please contact the editor.

- Membership Director Ron Hanson not present, Dana Minihan reported on the clothing options for the online NACTA store – options for clothing are shirts, hats and jackets with the NACTA logo; \$5 donation will be added to the final order to be donated to the NACTA Foundation; this information will be at the front of the ordering information. We are considering ten complementary registrations for the 2013 conference from schools that are not active in NACTA.

Virginia Tech Presentation for Conference 2013

A DVD presentation and invitation was made for the 2013 conference at Virginia Tech, Blacksburg, VA by Pavli Mykerezzi and Jim McKenna.

New business

- Montana State University was approved as the 2014 conference host
- An invitation was extended to attend the 2014 NACTA Conference at Montana State University by Tracy Dougher

Election Results Presented by Past President Kirby Barrick:

- President-elect – Jeff Hattey
- Central Regional Director-elect – Anne Marie VanDerZanden
- Canadian Regional Director-elect – Kent Mullinix

Committee Chairs and Liaisons

- Journal Awards Committee Chair Neil Douglas accepted 3rd term appointment as Chair
- Educational Issues & Teaching Improvements Committee chair Kimberly Moore appointed
- International Committee Chris Morgan was appointed chair in place of Mark Russell as Mark is the new Eastern Regional Director
 - AASCARR – Billye Foster accepted appointment for 2012-2013
 - CAPICU – Ed Brokaw accepted appointment for 2012-2013

Business Meeting recessed by Jeannette Moore

NACTA Foundation Meeting Opened by Advisory Council Chair Kirby Barrick

- NACTA and NACTA Foundation are separate entities

- All numbers for the NACTA Foundation approved by the CPA
- \$8,000 – Contribution
- \$9,685 – Current amount in spendable account
- \$1,774 – Administrative fee
- \$101,252 – Total amount in University of Wisconsin Platteville Foundation
- Current NACTA Foundation Director experiencing health problems
- Meeting with Advisory Council with possible ideas for partnering with NACTA for management of Foundation and fundraising

NACTA Foundation meeting adjourned by Kirby Barrick and NACTA Business Meeting reconvened
President Moore encouraged conference participants to look through the silent auction books being offered as the auction will end at 2:00 pm.
Business meeting adjourned at 1:30 pm.

Mark Your Calendars Now!
June 25 - 29
2012 NACTA Conference,

“Crossing Disciplinary Boundaries”
Virginia Tech, Blacksburg, VA
<http://www.cpe.vt.edu/nacta/>



NACTA

north american colleges and teachers of agriculture
connect | develop | achieve

Secretary / Treasurer Report



Secretary's Report

Membership records for NACTA are maintained in a Microsoft Excel file. This provides the least expensive and the most flexible recordkeeping system. The records include addresses, email addresses, year paid, membership type, and region. Records can be sorted and presented in a variety of ways and most NACTA members can be sent an email. Members continue to receive a unique membership number. Regional directors are supplied with lists of members in their regions twice a year or when requested.

A NACTA E-Newsletter is sent out several times during the year to update members and to keep email addresses current.

Membership notifications go out through email to individuals in the fall. If dues are not paid by the end of February of the next year, their name is taken off the mailing list. Members receive at least two personal reminders for membership renewal. Reminders also go out through the NACTA E-Newsletters. Payment can be taken by credit card or check. Credit card payments can be mailed or faxed. Members continue to take advantage of the three-year payment option. Every renewing member receives an email thanking them for their renewal. The NACTA Secretary appreciates the involvement of the Membership director and the Regional directors to encourage renewals for general memberships.

Every new member receives a letter welcoming them into NACTA and their name is passed to the Regional Director and the Membership Director.

There are approximately 850 members of NACTA – which includes individuals, institutions, and libraries. There were 150 new Institutional Active/Active members for 2011. (This number includes 71 Institutional Active/Active members from the 2011 University of Alberta Conference of which only 7 renewed for 2012). There were 24 new graduate students and one new Life membership. Approximately 180 did not renew for 2011 – many of them long time members. Membership numbers are calculated after June conference and before fall renewals.

A number of universities/colleges promote NACTA memberships and pay for either a one or three-year membership for individuals. In addition, some schools' departments pay for some faculty

NACTA memberships on a yearly basis. Those that have participated this past year are: Pennsylvania State University; Virginia Tech, Purdue University; University of Florida; University of Nebraska; University of Illinois; Sam Houston State University, Huntsville, TX, Crowder College, Neosho, MO, North Carolina State University and Kansas State University. For the record, if you know of some that have been missed, please inform the Secretary.

Several institutions were/are very late, are still in the process of renewing or did not renew for 2012. If you are aware of Dean/leadership changes, the secretary would appreciate the updated information. Regional Directors were very helpful in obtaining some of the institutional membership renewals. We have two new schools due to the NACTA Judging contest – Butler Community College, El Dorado, Kansas and Ivy Tech Community College, Terre Haute, IN. There were several colleges that participated in the Judging contest but did not pay their Institutional membership. How can we make sure this requirement is carried out?

We have 16 Canadian members plus 11 from the 2011 conference; five Canadian Institutions and three Canadian libraries. We have two foreign members, and three foreign libraries.

All member institutions received notification by email of their ability to present the Teaching Award of Merit Certificates and other advantages of Institutional membership. This year 37 Teaching Awards of Merit and 15 Graduate Student Awards of Merit were presented. This is a few more than last year. **How can we make them more aware of this award?** This information is available on the NACTA website. There were several current NACTA members that received this award.

Online voting was much more successful this year.

Action Item: Encouraging new memberships and retaining memberships is an ongoing theme. Why did 180 members not renew for 2012?

Treasurer's Report

Below is a profit and loss statement created by QuickBooks. The accounting firm of Mayes & Waters, in Rupert, Idaho, provided help in verifying the records. A detailed Profit & Loss statement is available for any NACTA member.

The membership dues are the major factor in keeping NACTA financially viable. In order to totally support the annual teaching awards, the current membership would need to double. The increase in dues in June 2007 put NACTA in the black in 2008-2009. One-time costs associated with the new NACTA website and the first annual hardcopy of the Journal put NACTA in the red for the 2009-2010 year. Website costs were down for 2010-2011

The \$8000 from Oklahoma State University donated to NACTA in October 2010 from hosting the NACTA 2009 conference, was placed into the NACTA

UW Platteville Foundation account in September 2011. Additional money was spent on secretarial work to scan all historical, individual memberships and institution records.

To keep NACTA in the black, it is critical that current membership's levels be maintained or preferably increased. Also, we need to determine a way to make sure the school/colleges that participate in the NACTA Judging contest pay their Institutional membership fees. There were seven participating institutions that did not pay which amounted to \$900.

The ending bank statement for the checking account ending in May 2012 is \$48,390.

Submitted by:
Marilyn B Parker
NACTA Secretary/Treasurer
June 2012

North American Colleges & Teachers of Agriculture Statement of Receipts, Disbursements and Members Equity For the Fiscal Year Ended 5-31-12	
Receipts	
Membership Dues	\$ 58,148
Royalties Income	613
Foundation - Awards	4,000
Position Announcement	400
Conference Income	923
Miscellaneous Income	<u>492</u>
Total Receipts	64,576
Disbursements	
Award	4,600
Conference Expense	2,903
Credit Card Fee	1,573
Honorariums	22,568
Insurance	150
Journal Miscellaneous Expense	3,045
Journal Printing	8,926
Miscellaneous Expense	1,456
Membership Refund	75
Postage	668
Professional Fees	1,250
Fall Meeting	382
Secretarial	3,099
Supplies	724
Travel	3,607
Web Site Expense	4,600
Contribution Foundation	<u>8,000</u>
Total Disbursements	<u>67,626</u>
Excess Disbursements over Receipts	(3,050)
Beginning Balance 6-1-11	<u>51,440</u>
Ending Balance 5-31-12	<u>\$ 48,390</u>

Join NACTA



Join NACTA today!

(North American Colleges and Teachers of Agriculture)

— a professional organization dedicated to advancing the scholarship of teaching and learning in agricultural, environmental, natural, and life sciences.

- Members have online access to the quarterly NACTA Journal, a professional, peer reviewed journal emphasizing the scholarship of teaching. At the end of the year, members receive a hardcopy of the Journal that combines the quarterly issues. The Journal also includes book reviews, teaching tips, and conference abstracts.
- Members attend the annual conference held at different colleges and universities in the U.S. and Canada, and where members present papers on innovative teaching concepts.
- Each year NACTA recognizes outstanding teachers with a variety of awards including: Teaching Awards of Merit, Teacher Fellows, Regional Outstanding Teacher Awards, NACTA-John Deere Award, Teaching Award of Excellence, Distinguished Educator, and Graduate Student Teacher Awards.

Membership Categories (circle one):

- **Institutional Active** Dues are \$75/year (if your University/college is a member)
- **Active** Dues are \$100/year
- **Graduate Student** \$25/year - Emeritus \$25/year
- **Lifetime** - \$750 -one payment (or \$800 if made in four payments of \$200)
- **Institutions** (\$150 for 4 year schools and \$100 for 2-year schools)



To join complete the following form.

Name:		Email:	
Institution:		Telephone:	
Address 1:			
Address 2:			
City:	State:	Zip:	

Send a check payable to NACTA for the correct amount or you can pay using a credit card (VISA and MasterCard only); phone calls also accepted 1-208-436-0692:

Name on Card: _____

Card Number: _____

Expiration (month/date): _____

Three digits on the back of your card to the right of the signature block: _____

Send your completed form to:

Marilyn B. Parker
NACTA Secretary/Treasurer
151 West 100 South
Rupert, ID 83350

For more information visit the
NACTA website:

www.nactateachers.org
or email nactasec@pmt.org

NACTA Committee Members 2012-2013*

Journal Awards

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Educational Issues & Teaching Improvement

Kimberly Moore, Chair
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NACTA Teacher Recognition Committee

Nick Fuhrman, Chair, University of Georgia
W. Stephen Damron, Oklahoma State University
Sam Doak, Virginia Tech
Kevin Donnelly, Kansas State University
Fred Fairchild, Kansas State University
Harry Field, Oklahoma State University
Jean Gleichsner, Fort Hays State University, KS
Lynn Hamilton, California Polytechnic State University
Alan Hansen, University of Illinois
Ronald J. Hanson, University of Nebraska-Lincoln
Jennifer Henke, University of California
Robin Peiter Horstmeier, University of Kentucky
Dann Husmann, University of Nebraska-Lincoln
Donald M. Johnson, University of Arkansas
Thomas Kuzmic, Oklahoma State University
Mickey Latour, Purdue University
Lurline E. Marsh, University of Maryland
Ed Miller, Oklahoma State University
Foy Mills, Abilene Christian University, TX
Jeannette Moore, North Carolina State University
Michael D. Mullen, University of Kentucky
Tory Parker, University of Illinois
Greg Pillar, Queens University, NC
Bryan Reiling, University of Nebraska
Herman A. Sampson, North Carolina State University
Shelly R. Sitton, Oklahoma State University
Robert J. Stephenson, Fort Hays State University, KS
Kirk Swortzel, Mississippi State University
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NACTA Foundation Advisory Council

Jeannette Moore
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jeannette_moore@ncsu.edu

*** If you are interested in serving on one of the committees contact the Chair.**



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**the professional journal advancing the scholarship of teaching
and learning in agricultural, environmental, natural, and life sciences**