NACTA

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

2012 - 2013 NACTA Officers

NACTA

north american colleges and teachers of agriculture

connect | develop | achieve

©2012

NACTA Journal

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

Contents

Rick Parker, Editor

nactaeditor@pmt.org

The Off-Campus Bachelor of Science in Professional Agriculture Degree Program: A Final Alumni Evaluation

Michael L. Pate[1]
Utah State University
Logan, UT

Greg Miller[2]
Iowa State University
Ames, IA

Abstract

The purpose of this study was to conduct a final program evaluation of the Bachelor of Science in Professional Agriculture Degree Program from the perspective of recent alumni. The typical graduate of the Bachelor of Science in Professional Agriculture degree program was male (54%), 46 years old, and took 60 months to complete the program. Most (87%) graduates had completed the program within six years. Graduates' highest-ranked factor for enrolling in the program was pursuing a degree followed by career advancement. Graduates were asked what specific aspects of the program that they liked best. The most frequently (65%, n = 15) cited strengths had to do with flexibility and convenience. The most significant obstacle faced by graduates was the limited number of course offerings, which was also the most frequently listed weakness of the program. It is recommended that persons responsible for distance education programs continue to pursue strategies (e.g. sharing course revenue with departments and faculty, sharing courses with other universities) that will ensure sufficient numbers and variety of courses.

Introduction and Background

Distance education has become an integral component of higher education institutions (Rovai and Downey, 2010; Lewis et al., 1997). The rapid adoption of online degree programs has led to reservations about program quality and completion rates by some administrators (Chau, 2010; Rovai and Downey, 2010; Lewis et al., 1997). Smith and Mitry (2008) questioned why certain universities (Temple University and New York University) had discontinued their online programs while others such as the University of Phoenix continued to see rising enrollments and expansion of global programs (Chau, 2010; Cronin and Bachorz, 2005).

Students' decisions to enroll in distance education are complex and diverse. Students' characteristics and motivations play a pivotal role in their program selection. One of the concerns with distance education compared to traditional on-campus programs has been a lack of consistent interactions with expert faculty and cohort members resulting from the variety of challenges and time constraints not normally encountered by traditional college students (Hezel and Dirr, 1990; Kelsey et al., 2002; Miller, 1995; Miller and Miller, 2005; Patterson and McFadden, 2009). The development of asynchronous delivery technologies has been shown to reduce the negative effects associated with obstacles related to time, cost, and convenience of distance education (Miller and Honeyman, 1993; Owen and Hotchkis, 1991).

Administrators often find that distance degree programs are more costly than anticipated (Smith and Mitry, 2008). Taube et al. (2002) conducted a comprehensive evaluation of the University of Wisconsin's Collaborative Nursing program to identify issues related to cost and access, impact of the program, availability and quality of support services, and technologies/learning modalities. The University of Wisconsin's distance program relied on combined resources of the five UW nursing programs plus additional support from the UW-Extension program (Taube et al.). Taube et al. noted that this program had been offering courses since 1996 with 184 nurses graduating from the program in 2001. Smith and Mitry (2008) argued that providing courses with lower enrollments at a distance that are of equal quality to on-campus courses

---

with larger enrollments is not cost effective because the per student variable costs are lower in large classrooms. The use of reputable faculty members who are recognized as experts in their fields to provide instruction for a few students at a distance is a large expense associated with online programs (Smith and Mitry, 2008). With low student enrollment, administrators may not be able to financially justify offering degree programs at a distance.

Iowa State University began offering a Bachelor of Science Degree in Professional Agriculture to distant learners in 1991. This was done to expand on its off-campus Master of Agriculture degree program which began in 1979. Both programs were created to extend educational opportunities in agriculture to persons who could not or preferred not to study on campus (Miller, 1995). A decision was made to begin phasing out the BS program in the fall of 2003. Difficulty in offering sufficient numbers and variety of off-campus courses at the undergraduate level was a major factor in the decision to discontinue this program. No students were admitted after summer 2003 and students who were already in the program had until the summer of 2009 to finish. Since program inception in 1991, 60 persons had graduated with a Bachelor of Science Degree in Professional Agriculture. With the closure of the BS program, a survey of recent graduates was conducted to provide a summative program evaluation focused on processes and outcomes (Fitzpatrick et al., 2004). Faculty and administrators associated with current or potential distance learning programs may be able to use this evaluation study to aid them in determining priorities for program design and/or improvement.

Purpose

The purpose of this study was to conduct a final program evaluation of the Bachelor of Science in Professional Agriculture Degree Program from the perspective of recent alumni. The objectives of this study included the following:

1. Describe demographic characteristics of individuals who graduated between summer 2001 and spring 2009 from the off-campus Bachelor of Science in Professional Agriculture degree program.

2. Describe program-related experiences of individuals who graduated between summer 2001 and spring 2009 from the off-campus Bachelor of Science in Professional Agriculture degree program.

3. Describe the perceptions of obstacles to off-campus study held by individuals who graduated between summer 2001 and spring 2009 from the off-campus Bachelor of Science in Professional Agriculture degree program.

Methods

Participants

This study was deemed exempt by the Iowa State University Institutional Review Board. The population for this study included 33 persons who earned a Bachelor of Science in Professional Agriculture degree from Iowa State University between summer 2001 and summer 2009. Names and contact information for these graduates were obtained through the Iowa State University Alumni Association. Lists were cross-checked for accuracy with graduation lists maintained by the Iowa State University Registrar's Office.

Instrumentation

The questionnaire used to collect data contained demographic questions, questions related to experiences with the degree program and a scale to measure perceptions of obstacles faced by off-campus students (Miller, 1995). Cronbach's alpha was calculated to estimate the internal consistency of the scale and resulted in a coefficient of .75 for data collected in 2009. A panel of faculty and graduate students in agricultural education judged the questionnaire to be content and face valid. Data were collected by mailed questionnaire.

Data Collection and Analysis

During the 2009 summer semester, all (N=33) individuals who earned a Bachelor of Science in Professional Agriculture degree at Iowa State University between summer 2001 and summer 2009 received a brief prenotice postcard individually signed by the co-principal investigators informing them of the study. A detailed information letter, questionnaire and return envelope were sent 3 days after the prenotice postcard. A brief reminder letter with a copy of the questionnaire and a return envelope were sent to nonrespondents 10 days after the detailed information letter. Ten days later, a second reminder letter was sent to the remaining nonrespondents. A final follow-up was conducted by telephone 14 days after the second reminder letter. The response rate was 72% (n=24). The researchers followed Lindner et al., (2001) recommendations for handling nonresponse. The protocol for comparing early and late respondents was used. No statistically significant differences were found. It was concluded that the results were generalizable to the target population. Data were analyzed with SPSS v.17 software. Descriptive statistics including frequencies, percentages, means, modes, medians, ranges and standard deviations were used to summarize the quantitative data.

Results and Discussion

The majority (54%) of the graduates from the off-campus Bachelor of Science in Professional Agriculture degree program were male. Graduates ranged in age from 29 to 60 years old. Their mean age was 46 years old (SD =9.63). The time to complete the off-campus degree program ranged from 12 to 240 months (see Table 1). Slightly more than half (56.5%) of the individuals responding took up to 48 months to complete the program. A component of evaluating the success of the off-campus program was determining if students are able to graduate in a timely fashion. As seen in Table 1, 57% of the graduates indicated graduating in four years after enrolling into the program. After 5 years, 79% of the graduates surveyed had completed the program and by 6 years 87% of the graduates surveyed had completed the program. Low enrollments coupled with extensive effort to advance students through the program influenced the decision to discontinue the off-campus Bachelor of Science in Professional Agriculture degree program.

Table 1. Time in Months Taken by Graduates to Complete the Off-Campus Program

Number of Months[z]	n	%	Cum. %
<25	5	21.7	21.7
25-36	3	13.1	34.8
37-48	5	21.7	56.5
49-60	5	21.8	78.3
61-72	2	8.6	87.0
73-84	0	0.0	87.0
85-96	0	0.0	87.0
97-108	0	0.0	87.0
109-120	0	0.0	87.0
>120	3	12.9	100.0

[z]$M = 60.17$, $SD = 50.09$.

Graduates were asked to identify their occupation at the time they enrolled in their degree program and at the time they participated in this study (see Table 2). At the time of enrolling in the program, the occupation most frequently held by graduates was "farmer" (30.4%). At the time of the survey, the percentage of graduates holding the occupation of "farmer" remained steady at 29.2%. At the time of the survey, there were two graduates (8%) indicating an occupation in each of the following areas: "agribusiness," "soil conservation" and "consulting." There was a slight reduction in the number of graduates holding "agribusiness" occupations from the time of enrollment until the time of the survey. The percentage of graduates who reported an occupation in "other" areas increased from the time of enrollment until the time of the survey by 6.5%. Selected examples of "other" occupations indicated by graduates included Dairy Market Analyst for USDA, Insurance Agent, Mortgage Loan Processor and Sales Engineer.

Table 2. Occupation of Graduates at the Time of Enrollment and at the Time of the Survey

Occupation	At Time of Enrollment (n = 23)		At Time of the Survey (n =24)	
	n	%	n	%
Farming	7	30.4	7	29.2
Agricultural Extension	0	0.0	1	4.2
Agribusiness	3	13.0	2	8.3
Agricultural Education Teacher	0	0.0	0	0.0
Soil Conservation	2	8.7	2	8.3
Agronomist	0	0.0	1	4.24.3
Researcher	2	8.78.7	0	0.0
Consultant	0	0.0	2	8.3
Sales Representative	1	4.34.3	0	0.0
Rancher	1	4.34.3	0	0.0
Other	10	43.5	12	50.0

Note. The numbers represent the percentage of respondents who indicated employment in each occupation. Some respondents indicated more than one occupation.

Graduates were asked if occupational changes were influenced by earning the off-campus degree. The percentage of graduates who credited their degree with occupational changes was 58%. The number and diversity of "other" occupations being held by graduates may indicate that the off-campus Bachelor of Science in Professional Agriculture degree opened various career opportunities.

Graduates of the off-campus Bachelor of Science in Professional Agriculture degree program were asked to rank four motivating factors for enrolling in the program (Table 3). The highest ranked factor for enrolling in the program was to pursue a degree followed by career advancement, acquiring current technical knowledge and the enjoyment of learning. These motivation factors provided insight into the complex and diverse reasons that graduates enroll in distance education.

Table 3. Mean Rankings and Standard Deviations for Factors that Motivated Graduates to Enroll in the Off Campus Program

Motive	n	M	SD
Pursuing a degree	23	1.35	0.57
Career advancement	22	2.41	1.26
Acquiring current technical knowledge	22	3.09	0.92
For the enjoyment of learning new information	22	3.50	1.30

Results in Table 4 indicate that there was not a great need for graduates of the off-campus Bachelor of Science in Professional Agriculture degree to travel to campus. Most (83%) of the graduates came to campus ten or fewer times during the course of their program. Asynchronous methods such as videotape and later web-based courses have become very popular delivery tools which could have lessened the need for students to attend classes at specific places and times.

Table 4. Number of Times Bachelor Graduates Traveled to Campus for Reasons Related to the Off-Campus Program (n = 24)

Number of Times	n	%	Cum. %
0 to 10	20	83.3	83.3
11 to 20	1	4.2	87.5
21 to 30	0	0.0	87.5
31 to 40	2	8.3	95.8
41 to 50	0	0.0	95.8
51 to 60	1	4.2	100.0
> 60	0	0.0	100.0

Table 5. Graduates' Perceived Significance of 13 Obstacles to Off-Campus Study (n = 23)

Perceived Significance[z]	n	%	Cum. %
Insignificant	1	4.3	4.3
Moderately insignificant	3	13.0	17. 3
Slightly insignificant	13	56.5	73.8
Slightly significant	6	26.1	100.0
Moderately significant	0	0.0	100.0

Note. Scale: 1=insignificant, 2=moderately insignificant, 3=slightly insignificant, 4=slightly significant; 5=moderately significant; 6=significant.

[z] M = 3.01, SD = 0.73

Graduates of the off-campus Bachelor of Science in Professional Agriculture degree program were asked to rate the significance of 13 obstacles to off-campus study using a 6-point Likert-type scale with response options ranging from insignificant to significant. When examining the 13 obstacles together, there were only six graduates (26%) who perceived them to be slightly significant. The overall mean rating for all 13 obstacles was 3.01 (SD = 0.73). A more detailed account of graduates' perceptions of each of the 13 obstacles to off-campus study is provided in Table 6. The obstacle with the highest percentage of graduates indicating slightly significant or higher was "limited course offerings" (87%) followed by the obstacle "difficulty in balancing school, personal and work responsibilities" (65%). Just over half (52%) of the graduates indicated that "program cost" was a significant obstacle along with the obstacle "lack of scholarships" (52%). "Dealing with a number of different departments" (0%), and "faculty that did not understand student needs" (13%) had the fewest number of graduates indicating that they were significant obstacles.

Table 6. Percentage of Respondents Who Selected Slightly Significant, Moderately Significant, or Significant for Each Obstacle (n = 23)

Obstacle	n	%
Limited number of courses offered.	20	86.9
Difficulty in balancing school, personal, and work responsibilities.	15	5.1
Lack of scholarships.	12	52.2
Cost of the program.	12	52.2
Attending sessions held on campus.	10	43.5
Lack of access to library facilities.	10	43.5
Lack of access to instructors.	9	39.1
Course offerings did not fit needs.	8	34.7
Lack of access to other students.	8	34.7
Accessing financial aid at the University.	7	30.4
Prerequisites required for classes.	7	30.4
Faculty did not understand student needs.	3	13.0
Dealing with many different departments on campus	0	0.0

Graduates were asked to indicate how satisfied they were with the program on a scale ranging from "very dissatisfied" to "very satisfied." Half (50%) were very satisfied, 46% were satisfied, and 4% were somewhat dissatisfied. Graduates were asked what specific aspects of the program that they liked best. Responses came from 23 different graduates. The most frequently cited strengths had to do with flexibility and convenience (n=15). One graduate commented that "I could do my class work when my time permitted" while another wrote that "it allowed me to complete a degree program without being in Ames." Quality instruction and advising were mentioned as positive program aspects seven times. One student wrote *"the teachers/professors were excellent to understand and learn under. Some of my professors I still read about in the local ag newspapers, farm magazines, etc."* Twenty one graduates commented on aspects of the program that were liked least. The lack of courses clearly stood out as a weakness and was mentioned seven times. One student wrote "the ability to choose different classes for the requirements" and another stated *"the lack of different courses. Often it seemed the courses were geared towards crop science and not towards animal science."* Less frequently cited weaknesses included slow response to questions by some instructors (n=3) and technical problems (n=3).

Summary and Recommendations

The reader is encouraged to exercise caution in generalizing the results to other settings. The off-campus Bachelor of Science in Professional Agriculture degree program was successful in extending educational opportunities in agriculture to distant learners. The program served a diverse clientele of adults with an almost equal number of males and females graduating between 2001 and 2009. Graduates overall were satisfied with the program and gave it credit for positive occupational changes. Regarding process, the program offered convenience and flexibility that was much appreciated by graduates. Faculty and advisors did a good job of working with students in the program. The most significant obstacle faced by graduates was the limited course offerings which was also the most frequently listed weakness of the program. Difficulty in offering sufficient numbers and a variety of off-campus courses at the undergraduate level was a major factor in the decision to discontinue this program. The College of Agriculture and Life Sciences at Iowa State University no longer offers the off-campus Bachelor of Science in Professional Agriculture degree program, but it has expanded the emphasis on distance learning at the master's degree

level to include programs in Community Development, Agriculture, Agricultural Education, Agronomy, Seed Technology and Business. Rovai and Downey (2010) described that distance education programs are facing increased pressure from globalization of higher education resulting in competition for students that has lead to added pressures for controlling costs and rising tuition. They noted that to reduce the likelihood of economic failure online programs must be able to successfully adapt to this environment. Rovai and Downey (2010) noted seven factors to help determine the success of online higher education programs which include planning, marketing and recruitment, financial management, student retention, faculty development, online course design and pedagogy. We recommend that persons responsible for these graduate programs continue to pursue strategies (e.g. sharing course revenue with departments and faculty, sharing courses with other universities) that will ensure sufficient student numbers and variety of courses. Additionally, we recommend that future program administrators focus on ensuring students are able to complete an off-campus program in a timely fashion to allow for enrollment of new cohort groups. This will ultimately determine program sustainability.

Literature Cited

Chau, P. 2010. Online higher education commodity. Jour. of Computing Higher Education 22(3): 77-191. DOI:10.1007/s12528-010-9039-y.

Cronin, J.M. and P.M. Bachorz. 2005. The rising of Phoenix and what it means for higher education. Jour. of Education 186(1):11-21. Retrieved from http://www.bu.edu/journalofeducation/

Fitzpatrick, J.L., J.R. Sanders and B.R. Worthen. 2004. Program evaluation: Alternative approaches and practical guidelines (3rd ed.). Boston, MA: Pearson.

Hezel, R. and P. Dirr. 1990. Understanding distance education: Identifying barriers to college attendance. Retrieved from ERIC database. (ED340335).

Kelsey, K.D., J.R. Lindner and K.E. Dooley. 2002. Agr. education at a distance: Let's hear from the students. Jour. of Agr. Education 43(4):24–32. DOI:10.5032/jae.2002.04024.

Lewis, L., D. Alexander and E. Farris.1997. Distance education in higher education institutions, NCES 98-062. U.S. Department of Education, National Center for Education Statistics, Greene, B. Project Director. Retrieved from http://www.ed.gov/NCES/.

Lindner, J.R., T.H. Murphy and G.E. Briers. 2001. Handling nonresponse in social science research. Jour. of Agr. Education 42(4): 43-53. DOI:10.5032/jae.2001.04043.Miller, G. 1995. Off-campus study in agriculture: Challenges and opportunities. Jour. of Agr. Education 36(2):1-7. DOI:10.5032/jae.1995.02001.

Miller, G. and M. Honeyman. 1993. Attributes and attitudes of students enrolled in agriculture off-campus videotaped courses. Jour. of Agr. Education 34(4):85-92. DOI: 10.5032/jae.1993.04085.

Miller, G. and W.W. Miller. 2005. Trends in learner characteristics and program related experiences associated with two off-campus agriculture degree programs. Jour. of Agr. Education 46(4):2–12 DOI:10.5032/jae.2005.04002.

Owen, M. and R. Hotchkis. 1991. Who benefits from distance education? A study of Athabasca Univ. graduates, 1985-1990. Retrieved from ERIC database. (ED341301).

Patterson, B. and C. McFadden. 2009. Attrition in online and campus degree programs. Online Jour. of Distance Learning Administration 12(2). Retrieved from http://www.westga.edu/~distance/ojdla/summer122/patterson112.html.

Rovai, A. and J.R. Downey. 2010. Why some distance education programs fail while others succeed in a global environment. Internet and Higher Education, 13(3), 141-147. DOI:10.1016/j.iheduc.2009.07.001.

Smith, D.E. and D.J. Mitry. 2008. Investigation of higher education: The real costs and quality of online programs. Jour. of Education for Business, 83, 147-152. DOI:10.3200/JOEB.83.3.147-152.

Taube, K.S., B. Burrell, S.R. Nellis and P.A. Lasky. 2002. Evaluation to strengthen distance learning programs. Jour. of Higher Education Outreach and Engagement, 7(1-2):119-125.

Experiential Learning through Industry Interaction in a Large Lecture Agribusiness Course

W. Scott Downey[1]
Purdue University
West Lafayette, IN

Abstract

Budget pressures in many colleges of agriculture are resulting in larger class sizes. Large lecture classes often come with a sacrifice of individual interaction between instructor and learners. This article presents an innovative approach for incorporating industry interaction into a large agribusiness class. A project called "Ready, Set, Sell!" provides a structured interaction in which students work with an individual industry coach with support from instructors. At the conclusion of the semester, students and industry representatives collaborate in a role play. The event results in positive outcomes for learners, companies and instructors. Suggestions for teachers who wish to utilize a similar approach include ways to develop industry resources and considerations for monitoring student experiences.

Introduction

Undergraduate education finds itself in an era of tight budgets in which teaching larger groups of students is becoming more prevalent (Haurwitz 2010; AP 2011). Agriculture programs have not escaped budget cuts with the consequence that some institutions are seeing larger class sizes (Hayhoe and Thompson, 2011). With larger class sizes, the opportunities for one-on-one instructor interaction, a hallmark of many agricultural programs, may be sacrificed. Many colleges of agriculture have looked for creative partnerships with industry to address funding concerns (Rivera, 2011) or to provide additional instructional resources (Henneberry, 1990). This article presents an approach to involving industry resources to help build communication skills in a large lecture agribusiness classroom.

Agricultural programs are responding to budget cuts in nearly every state. Often this has resulted in cuts to staff and intentionally larger class sizes (South Dakota State University, 2011; University of Hawaii at Hilo, 2010). Some programs are seeing increased enrollments at the same time (Rivera, 2011) and have looked for a variety of solutions to address higher demand (Hayhoe and Thompson, 2011).

Involving business in agricultural education is one way in which some programs have sought to fund shortfalls (Rivera, 2011), but the benefits of industry involvement extend beyond financial. Henneberry (1990) discussed the value of including industry guests as lecturers at Oklahoma State University and pointed out the appreciation students had for the "real world" perspective the guests brought. Litzenberg and Dunne (1996) suggested several ways in which industry partnerships could be created, pointing to mentorships as an example of industry interaction that can have advantage for students, companies and faculty. Baker et al. (2008) described ways in which collaborations with industry could be managed and suggested several dimensions of these partnerships that included costs and benefits for each participant. Short term group projects for master's students were provided as examples. Mentoring for MBA students and site visits were also suggested as valuable experiences. These two approaches were viewed positively by industry as well (Baker et al. 2008).

While there appear to be clear benefits for creating student experiences with industry, pragmatically, ways to accomplish this in today's larger classes have not been described and are not obvious beyond the occasional classroom guest. This article presents the pedagogical background for creating individual, interactive experiences for students with industry, describes one way that this has been accomplished in a large agribusiness selling course and addresses the benefits and challenges for students, businesses and faculty who are involved in the process. The article concludes with suggestions for teachers who wish to utilize a similar approach.

[1]403 West State Street; Email: downeyws@purdue.edu

Experiential Learning

Kolb (1984) describes experiential learning as an integrative process that has "intellectual origins" in the works of Dewey, Lewin, and Piaget. These authors provided models of learning that connected cognitive and experiential events. Kolb described experiential learning as a process, not an outcome. Experiential learning takes place as expected norms are interrupted by conflicts which require adaptation to resolve. Thus, instructors who put students in a position to participate in events that are unique to their personal history, facilitate adaptation and learning.

Peuse (1989) drew from Kolb, Steinaker-Bell, and Krebs to describe the role of the instructors of agriculture in training. He emphasized that it is important for trainers to plan learning experiences that allow learners to practice new skills and reflect their performance. Kirkpatrick also emphasized practice, but as an outcome indicating that learners are translating knowledge into behavior - the stated objective of most training efforts (1996). Perhaps most influential in addressing the process of learning and training was Bloom, who's taxonomy conceived with David Krathwohl included application as one of six cognitive domains (Krathwohl, 2002). Newcomb and Trefz considered these issues within agricultural education, suggesting that there were four levels of learning behaviors that should be used to assess collegiate student outcomes in academic programs: Remembering, Processing, Creating, and Evaluating (2005, from the original publication in 1987). At hand is the issue of how these tasks may be enhanced with industry interaction.

Elam and Spotts advocate for the use of live cases in the business marketing classroom, integrating students and clients in real world interactions (2004). This approach is consistent with service learning as proposed by Bringle and Hatcher in 1996 (Zlotkowski, 1999). This type of experiential learning has students move outside of the classroom to thoughtfully relate course material to community needs. Hagenbuch (2006) has utilized this approach to help students apply the knowledge gained in a college sales course in the service of not-for-profit community organizations, demonstrating positive outcomes to learning measured attitudinally. Community needs are often defined within human service causes, but the counterpart commercial experience may provide similarly unique events to which students must apply knowledge and adapt behavior.

Deeter-Schmelz and Kennedy surveyed sales curricula and found that experiential learning was included in more than 97% of undergraduate sales education courses in the form of role plays. Widmier

et al. (2007) describe how competitive experiences within this domain teach both selling skills and teamwork. Mantel et al. (2002) describe a similar type of role play that involved interaction between students in sales, purchasing and management. There are several national competitions in which industry professionals are used to evaluate sales presentations in a competitive environment (Loe and Chonko, 2000), but this is typically an extracurricular activity and usually outside of agriculture. Training experiences within the controlled environment of a role play may benefit learners even more than real world experiences, as the ability to control the environment and provide immediate feedback helps them develop effective cognitive scripts (Leigh, 1987).

In 2004 the National Food and Agribusiness Management Education Commission (NFAMEC) suggested that industry could play an important role in helping develop agribusiness programs and, with their engagement, the faculty who teach in them. Two of the members of this committee, Akridge and Boland, state that *"Engagement with industry is of critical importance in creating a unique set of experiences for agribusiness degree students"* (2004, p. 573). The reports suggest several approaches for making this happen, including guest lectures, field trips and mentoring. Experiential learning and industry involvement in the classroom may benefit learners, but the practical methods for including this approach within a large class have not been previously presented in the literature.

Methods

For many years, Purdue University has taught an introductory course in professional selling in agribusiness, primarily to sophomore and junior students. It is a service course that has had average enrollments of 350 students from many majors around the campus over the last ten years. The course provides a fundamental approach to selling that is the entry point into two bachelor's degree programs – Selling and Sales Management (housed in the College of Health and Human Sciences) and Sales and Marketing (housed in the department of agricultural economics in the College of Agriculture). Because of limited teaching resources, the course is taught as one section each semester. Typically, about 30% of the students in the course come from the College of Agriculture. Of those, about ten students each semester will proceed toward a Sales and Marketing degree. Other students from the college of agriculture are studying agribusiness or agricultural economics, animal sciences, agronomy, agricultural engineering,

education, landscape and horticulture related majors, forestry, food science, or a few other specialty areas within the college.

The major experiential learning activity in the course is a project called, "Ready Set Sell!" Near the beginning of the course, each student selects a product that they would like to learn to sell during the semester. The product choice must fit within a limited number of categories (i.e. agricultural equipment, seed, crop protection, food, etc.) and the student must locate a "sales coach" from industry who will be an advisor to them on the sales process for their specific product throughout the semester. Students must arrange for an opportunity to observe their coach interacting with customers in the field at some point before the end of the semester. For the final "exam," the instructor invites a different set of sales professionals to come to campus as "evaluators" and participate in a sales role play. The role play is a graded activity in which the sales professional portrays a customer for each of three to five students in a group. Each student takes a turn "calling" on the pretend customer portrayed by the evaluator. Each student's sales call is graded by the evaluator and peers in their group.

As students prepare for the sales call role play throughout the semester, they complete a structured interview with their sales professional by phone or in person, in order to gain an understanding of how their product is marketed in the real world. Students are then asked to apply the general knowledge of the sales process that is presented in lecture to the specific process that is used for their product. The sales process is broken into components and the student's effort to apply general knowledge of each component concept to their specific product is graded. Students adjust their presentations on the basis of the graded feedback they receive. Industry guests are also interviewed by the instructor in the classroom throughout the semester to help students see how course materials are interpreted by individual companies in the real world. Through these activities, students are asked to remember, process, create and evaluate, consistent with Newcomb and Trefz (2005). Collectively, the three hundred students interact with more than 425 sales professionals each semester. They gain knowledge about selling through a textbook and lecture, hear it illustrated with guests in class and in interviews with coaches, observe coaches putting a similar process to work in the field, practice it through their own participation in the role play and evaluate the role play experiences of others.

Quay and Quaglia (2004) suggest that instructors should encourage healthy risk-taking by making it safe for students to both fail and succeed. The "Ready Set Sell!" project allows students to do both. This is reflected in the assessment structure for the role play component of the project. Student grades and scores for the event are calculated based on a forced ranking of evaluators, along with the scoring of evaluators and students. Grades for the event are bounded at the top and bottom, based on these inputs. Therefore, although participation in the role play is 15% of the student's semester grade, the minimum score is 78% of that for students who complete the required event (and the maximum is 96%). This helps to take some of the worry off of "bombing" the event with a low score so that students can focus on their performance and be open to feedback from the evaluator and peers.

Results and Discussion

Over the last five semesters, as shown in Table 1, there have been 1,536 students who have completed the "Ready Set Sell!" project. Agriculture students made up 35.9% of this population. Students from Engineering and Pharmacy are included in the "Other" category. A large number of undecided students take the course with recommendations from their advisors to try the experience to see if selling would be a good career fit for them. Freshmen have generally been discouraged from taking the course. Sophomore status is the most common among those in the course at 38.3%, with juniors and seniors at 34.0% and 22.6% respectively.

Table 1. Course Demographics					
	F2011	S2011	F2010	S2010	F2009
Major					
Agriculture	84	137	107	125	98
Health	54	62	53	52	83
Management	60	73	43	62	61
Technology	17	7	12	6	11
Undecided	71	57	49	46	56
Other	9	11	11	7	12
Status					
Freshmen	29	6	16	3	24
Sophomore	115	119	102	130	122
Junior	91	128	96	104	103
Senior	60	94	61	61	71

For students, the results have been very positive. As shown in Table 2, over the most recent five semesters with course evaluations, 26.2% of comments relating to the course have been about the "Ready Set Sell!" project. 15.4% of the course comments were explicitly about the "Ready Set Sell!" role play event and of those 87.5% were positive. Negative responses included criticism of the work load required and a specific evaluator. Positive comments were generally expressed as appreciation for the "real world" application of course material.

Table 2. Student Responses					
Number of Responses	F2011	S2011	F2010	S2010	F2009
Comments about course	63	72	85	61	83
Positive about RSS Experience	8	6	18	5	12
Negative about RSS Experience	1	2	3	0	1

Through the "Ready Set Sell!" experience, students get a perspective of potential employers that can't be obtained at career fairs and job interviews. Each semester one or two students initiate contacts with evaluators that lead to jobs or internships. Companies who participate as evaluators or coaches get to observe student professionalism and performance outside of a typical interview setting. Companies appreciate that students get to see them in a different way than they do in the interview process and that students have a higher awareness of the company as a potential employer. Approximately 50% of evaluators return each semester, with several having participated more than 20 times. On average, 68% of evaluators for the last five semesters have participated in that role at least once before. Anecdotally, alumni of the course frequently mention the "Ready Set Sell!" project as a memorable component of their college experience.

For students, the challenges expressed in course evaluations tend to be around workload. In class, concerns are usually expressed around uncertainty about what to expect, anxiety with regard to speaking in front of others, or dealing with a specific component of the course content – handling customer objections. Professionals who participate often express curiosity with regard to course content (which is nearly always confirmed as consistent with field experiences and training), time requirements ("What will my commitment be as a coach?"), or self-doubt ("I'm not sure I'll know what feedback to give to students"). To alleviate student concerns, a dress rehearsal in which students meet others who will be in their peer group for the event and practice their role play is conducted. Not only does this provide practice in a controlled setting, but it allows them to preview the levels of preparedness and quality of competing presentations. An evaluator from a previous semester is typically asked to speak in class to address student anxieties as well. Also, to help set student expectations a video presentation of the event from an earlier semester is played and two student volunteers from the current semester demonstrate the role play live in front of the class (which is quite daunting in front of 350 peers).

To address challenges for salespeople, students are coached and provided resources on managing their relationships with coaches. Coaches are sent an email from the instructor expressing gratitude and offering a resource. Each semester a required training session for evaluators is held immediately prior to the role play event so that they know what to expect. Evaluations are highly structured.

For faculty there are several challenges. Requiring students to find a coach creates real or perceived hurdles for students to overcome. Students who come from a distance may be hampered in their ability to locate a coach who they can feasibly observe. These students require some support and an active hand in helping them locate a suitable coach. The pool of past coaches can be useful for this group. Some students are uncomfortable using a professional network or have not yet developed one and will need a firm hand to help them step through the possibilities.

Coaching interactions and field experiences are, by design, held away from campus, which prevents instructor intervention. Students are required to turn in papers that summarize each of these activities, but there is tremendous variation in the quality of these interactions. These factors lead to two concerns: academic dishonesty and assessment validity.

There have been more than ten instances of dishonesty discovered among more than 1500 students who have taken the course in the last five semesters. These have fallen in to two categories: Students who don't have a field experience, but submit a paper indicating they have and students using papers from prior semesters. To address these issues, students are required to take and submit pictures from their field experiences and to submit contact information for their coaches, who are contacted by the instructor.

The role plays are conducted in 75-80 small groups, dispersed into classrooms around campus. It is impossible for the instructor to be present in each room and would potentially increase student anxiety in rooms where the instructor is present. Student assessment is accomplished with input from peers and evaluators, but there are still sometimes conflicts. For this reason, students are asked to record their presentations. Students who don't feel that their assessment scores accurately represent their performance are encouraged to provide the recording to the instructor for an arbitrated evaluation. In smaller classrooms, the recordings could be used at a later time for student instruction, but this has not been incorporated into the large classroom.

An additional challenge for faculty is locating enough sales professionals to serve as evaluators. A ratio of one salesperson for every four students seems ideal. In practice, observations of five and six student groups indicate some burn out from students and industry representatives. Groups of two and three tend to lack formality for good feedback discussions.

Once the program is established, the task of finding enough evaluators is quite manageable, drawing from the pool of sales coaches and previous evaluators. Many of the communications and logistics to accomplish this become routine and can be accomplished electronically, but telephone support requires individual effort and time. In the course presented here, undergraduate teaching assistants help with this task. Requests coming from students are well received and the students appreciate the interaction with industry professionals. Follow through for evaluators is sometimes a challenge; typically about 10-15% of committed evaluators are unable to participate. A surplus of evaluators and back-ups is necessary to account for this. Every effort is made to match evaluator expertise to the category of product being presented (i.e. animal health sales people with students selling animal health products). Replacements are not always able to bring those skills, however, so students must be told of this potential in class periods before the event in order to manage their expectations. Historically, evaluators in traditionally consumer sales roles (i.e. cell phones, office supplies, clothing) tend to have a higher number of unforeseen conflicts that prevent their participation.

Summary

Experiential learning through role play requires a high degree of structure and observation in a large lecture classroom, but that should not preclude the use of this type of tool. As class sizes grow, instructors necessarily must find more efficient ways to create quality learning experiences for students. Leveraging industry participation provides benefits for students in terms of their exposure to real world activities and helps them make important career contacts. Companies appreciate the opportunity to interact with students outside of the interview process. Alumni, in particular, seem to appreciate returning to campus to meet fellow alums and to give back to their alma maters. Faculty are provided with feedback on the changing aspects of selling and are able to achieve learning outcomes that are difficult to replicate with traditional lectures. Large class sizes require administration and experiential learning can add to this burden. However, the effort is worthwhile in order to be able to create positive learning outcomes for students.

Literature Cited

Associated Press. 2011. "Average class size increases at Iowa universities," The Gazette, 1/24/2011.

Baker, G.A., A.F. Wysocki and L.O. House. 2008. Industry-academic partnerships: The view from the corner office. International Food and Agribusiness Management Review 11(3):57-80.

Baker, G.A., A.F. Wysocki, L.O. House and J.C. Batista 2008. Industry-academic partnerships – benefit or burden? International Food and Agribusiness Management Review 11(1):97-117.

Boland, M.A. and J.T. Akridge. 2004. Undergraduate agribusiness programs: Focus or falter? Review of Agricultural Economics 26(4):564-578.

Deeter-Schmelz, D.R. and K.N. Kennedy. 2011. A global perspective on the current state of sales education in the college curriculum. Jour. of Personal Selling and Sales Management 31(1): 55-75.

Elam, E.L.R., and H.E. Spotts. 2004. Achieving marketing curriculum integration: A live case study approach. Jour.l of Marketing Education 26(1):50-65.

Hagenbuch, D.J. 2006. Service learning inputs and outcomes in a personal selling course. Jour. of Marketing Education 28(1):26-34.

Haurwitz, R. 2010. Texas colleges, universities, bracing for deep budget cuts. American Statesman. 11/14/2010. www.statesman.com/news/tex-politics/texas-colleges-universities on 2/21/2011.

Hayhoe, B. and K. Thompson. 2011. Keeping track of tenure. The State News.com. Accessed January 27, 2012 from http://www.statenews.com/index.php/article/2011/10/keeping_track_of_tenure.

Henneberry, S.R. (1990. Industry speakers teach agricultural marketing at Oklahoma State University. NACTA Jour. 34(1):41-44.

Kirkpatrick, D. 1996. Great ideas revisited. Training and Development 50(1): 54-59.

Kolb, D.A. 1984. Experiential learning: Experience as the source of learning and development, Englewood Cliffs, NJ: Prentice Hall.

Krathwohl, D.K. 2002. A revision of Bloom's taxonomy: An overview. Theory into Practice 41(4):212-260.

Leigh, T.W. 1987. Cognitive selling scripts in sales training. Journal of Personal Selling and Sales Management 7(2):39-48.

Litzenberg, K.K. and A.J. Dunne. 1996. Partnerships with industry: The essential ingredient for agribusiness education. Jour. of Agribusiness 14(2):197-203.

Loe, T.W. and L.B. Chonko 2000. Promoting sales programs: The national collegiate sales competition. Jour. of Personal Selling and Sales Management 20(1):11-13.

Mantel, S.P., E.B. Pullins, D.A. Reid and R.E. Buehrer. 2002. A realistic sales experience: Providing feedback by integrating buying, selling and managing experiences. The Jour. of Personal Selling and Sales Management 22(1):33-40.

Newcomb, L.H. and M.K. Trefz. 2005. Toward teaching at higher levels of cognition. NACTA Jour. 49(2):56-60.

Peuse, H.G. 1989. Experiential learning models for training programs. NACTA Jour. 33(2):61-65.

Quay, S.E. and R.J. Quaglia. 2004. Creating a classroom culture that inspires student learning. The Teaching Professor 18(2):1.

Rivera, C. 2011. Funding is down on California's college farms. Los Angeles Times. Accessed January 28, 2012 from http://articles.latimes.com/print/2011/aug/09/local/la-me-college-agriculture-20110808.

South Dakota State University. 2011. SDSU Officials announce actions to balance budget. Accessed on January 26, 2012 from http://www.sdstate.edu/news/articles/budget2011.cfm.

Widmier, S., T. Loe and G. Selden. 2007. Using role-play competition to teach selling skills and teamwork. Marketing Education Review 17(1):69-78.

University of Hawaii at Hilo. 2010. Listening tour 2010: Meeting with the College of Agriculture, Forestry and Natural Resource Management. Accessed January 28, 2012 from http://hilo.hawaii.edu/strategicplan/documents/FINALLTSummarynote_CAFNRM.pdf.

Zlotkowski, E. 1999. Pedagogy and engagement. In R. Bringle (Ed). Colleges and Universities as Citizens (96-120). Boston: Allyn and Bacon.

Mark Your Calendars Now!
June 25 - 29
2013 NACTA Conference

"Crossing Disciplinary Boundaries"
Virginia Tech, Blacksburg, VA
http://www.cpe.vt.edu/nacta/

Virtual Education Center for Biorenewable Resources: Humanizing Distance Education[1]

Brandi N. Geisinger[2]
D. Raj Raman[3]
Karri M. Haen[4]
Mari R. Kemis[5]
Iowa State University
Ames, IA

Michael L. Pate[6]
Utah State University
Logan, UT

Abstract

Despite the obstacles to traditional distance education courses, distance education and social learning theorists suggest effective distance education courses can be developed. For this study, we designed a new distance education course model and attempted to 1) Test the effectiveness of the virtual education center model, understood through the lens of social learning and distance education theories; 2) Discuss potential improvements to the model; and 3) Build upon distance education and social learning theories. To achieve these goals, distance education courses were offered using the new model. Participating faculty and graduate assistants responded to a survey asking about their experiences with the model. Undergraduate learning was assessed by examining students' quiz grades, the number of times they attempted quizzes and their ratings and comments for each class period. Students demonstrated learning regardless of whether lectures were live or recorded. Faculty members and graduate assistants learned about biorenewable resources and offering courses through distance education; they also made suggestions to improve future distance education courses. The distance education model used in this study is an effective means of educating students, teaching assistants, and faculty members. Implications for distance education theory and distance education efforts are discussed.

Introduction

As biorenewable resources have become increasingly important nationwide (Biomass, 2002; Biobased, 2003; Van Gerpen, 2005; Brown, 2003; Kamm and Kamm, 2004), universities have struggled to provide students with the up-to-date education required to train graduates for critical roles in industries producing and using biorenewable resources. Faculty experts on renewable resources, while nationally plentiful, are spread diffusely throughout the country; no single institution has experts in each area of biobased products and technologies. Moreover, although student interest across the nation in this area is significant, student numbers at any single institution are often insufficient to meet minimum enrollment requirements for relevant courses. If students could be shared across institutions, a critical mass of students from multiple institutions could populate a single course. If faculty at each institution could provide lectures for the course, then the overall teaching load for each faculty member would decrease. Taken together, such an approach could simultaneously increase the quality of lectures provided to students and increase the efficiency (student credit hours per unit faculty effort) of instruction. Distance education provides an opportunity for such a model.

Virtual Education Center

The effectiveness of distance education is well proven (Gomory, 2001; Mayadas, 2001; Peterson and Feisel, 2002; Merino and Abel, 2003; Coward et al., 2000). Distance education can help establish and maintain critical academic fields, despite geographic dispersal of faculty and students. However, distance education runs the risk of reducing student connectivity, can pose technical problems, and may require an increased time commitment for instructors (Bourne et al., 2005). Providing effective distance education can be even more complex for technical fields such as science, agriculture, and engineering (Campbell et al., 2002; Campbell et al., 2003). Most faculty members prefer teaching courses face-to-face and perceive increased opportunities for student interaction in non-distance courses (Taylor and White, 1991).

Synchronous distance education learning allows for student-instructor interaction, but these interactions are seldom at the same level as can be achieved by direct classroom interaction between the instructor and students. In fact, researchers have found that many synchronous distance education environments lack interactivity; students are often unable to ask questions or receive direct feedback, and both teachers and students tend to interact less, even when interaction is an option, due to the cumbersome technical processes involved (Angeli et al., 2003; Mauve et al., 2001). Overall, the achievement rates of students in traditional classroom settings tend to surpass those of their counterparts in synchronous learning environments (Bernard et al., 2004).

The barriers to multi-institutional distance education efforts are well known to practitioners but poorly documented, although some have noted prohibitive costs, difficulties with technological limitations, timing of courses around holiday breaks and across time zones, unequal student prerequisites at the different institutions, and problems achieving interaction with both on-site and off-site students (Crow et al., 2000; Muilenburg and Berge, 2005).

Distance Education Theory

Some scholars have become disillusioned with distance education, citing the many problems that create barriers to effective distance education and even calling it a "pursuit of fool's gold" and a "technological tapeworm" (Noble, 1999; Noble, 2001). Others remain more optimistic, pointing to the theory that has begun to emerge from distance education research as evidence that distance education can become more effective if distance education theory is allowed to grow and change as technology and research progress (Garrison, 2000; Gunawardena and McIsaac, 2004).

These scholars emphasize using the existing body of research to design effective distance education courses.

Distance education theory is a constructivist approach, and theorists stress multiple factors as being important in distance education courses (Garrison, 2000; Gunawardena and McIsaac, 2004): 1) Delivery and accessibility of course content; 2) Control (e.g., whether students can watch lectures anytime and can stop and rewind them versus having lectures which students must watch at a given time); 3) The amount of teacher-student interaction and student-student interaction (Garrison and Cleveland-Innes, 2005; McIsaac and Gunawardena, 1996; Moore, 1989); 4) The amount of social presence created by the method of course delivery (the extent to which students feel like a part of the class); 5) The amount of transactional distance (the amount of structure in the course and the amount of teacher-student dialog) (Moore, 1990); and 6) The characteristics of the medium used to transmit information from teacher-student. The ideal class, these theorists argue, would thus employ methods of teaching and use a medium that would allow high levels of accessibility to course content, student control, interaction, social presence, and low levels of transactional distance.

Social Learning Theory and Distance Education

Social learning theory, like distance education theory, is a constructivist approach that lends insight into the factors which shape effective education. Social learning theory has been applied to distance education in ways that sometimes overlap distance education theory and often expand it. Social learning theorists state that the first important point of designing a distance education course is paying attention to the context (Hill et al., 2009). As part of this, these theorists stress that learning takes place in real-world environments (Jonassen et al., 1995; Norman, 1993; Woo and Reeves, 2007), during quality interactions, (Garrison and Cleveland-Innes, 2005; Henning, 2004; Woo and Reeves, 2007) and via modeling (Bandura, 1977). Because interaction is important, theorists say it is important to monitor class sizes for online courses to increase interaction (Palloff and Prat, 1999) and provide and use a variety of mediums to accommodate different learning styles (Hill et al., 2009). Social learning theorists also pay attention to the culture in the online classroom, since researchers have found that students' gender and ethnicity impact classroom experiences (Fahy, 2002; Lim, 2004; Wheeler, 2002). Social learning theorists emphasize community in the

classroom. Similar to social presence, this refers to the sense of belonging in the class (Hill, 2002). Finally, social learning theorists recommend paying attention to the learner characteristics of students in the classroom and their epistemological beliefs, learning styles, level of self-efficacy (Bandura, 1993), and their motivation for the course (Hill et al., 2009).

The Virtual Education Center Model

To overcome the problems common to distance education, we hypothesized that an effective inter-institutional model could be developed using the theoretical guidelines proposed by distance education theory. It was hoped that the development of such a model could educate students in biorenewable resources and thus have implications at the state, regional, and national levels. To create an effective distance education model, faculty from three land-grant institutions collaborated to teach three inter-institutional biobased courses: Fundamentals of Biobased Products and Technologies, Production and Use of Biofuels, and Thermochemical Processing of Biomass. This resulted in the development of a new course model (Figure 1), with similarity to distance learning and social learning theories, called a virtual education center (VEC).

In the VEC, faculty from multiple institutions share video lectures with one another, and each faculty member uses their own lectures, and video lectures from off-site instructors, to teach students at their own institution.

The goal of this study was to 1) Develop an effective distance education model that can overcome the obstacles of faculty and student dispersal; 2) Test the effectiveness of the new distance education model, understood using the lens of social learning and distance education theories, in promoting undergraduate, graduate, and faculty learning; 3) Discuss potential improvements to the developed course model; and 4) Build upon distance education and social learning theories based upon the results of this study.

Approval for this study was granted by the Institutional Review Board at the university where the study took place.

Method

For this study three faculty members worked together to deliver a total of 42 lectures. All lectures were recorded and made available to all instructors electronically; each instructor was responsible for making the recorded lectures available to students at their own site (that is, there is no central site where all students go to see the lectures). This is significant because 1) faculty members did not wish to be responsible for IT support to students at other institutions, and 2) it ensures the accessibility of the content for students. When using lectures from collaborating faculty members, the on-site instructors

Figure 1. The VEC Model

1. Each professor uploads lectures to a central database. Then, each professor downloads the lectures of the two other participating faculty members and ensures content accessibility to all students at the site.

2. Each professor shows lecture content from all participating faculty members to students at their site and interacts directly with students at the site. This allows increased interaction, student control, community, and social presence while decreasing transactional distance. It also allows the professor to fine-tune the course based upon the learner characteristics and needs of the students at their site.

Professor 1

Professor 2

Professor 3

typically had students watch the lectures outside of class and then used recitation-style class meetings to review key concepts or work problems.

In delivering the recorded lectures, multi-modal files with two panes were used so that a small image of the instructor and a larger image of an electronic whiteboard or PowerPoint slide could be displayed to the students. Each course was offered for credit by each of the participating institutions. Teaching resources were shared; however, no credits or fees were exchanged between universities.

The VEC model was an effort to share geographically diverse resources – while maintaining the best aspects of in-class lectures – and allowing students to learn by observing their instructors experience and solving hands-on, logical, or quantitative problems and allowing passionate instructors to bring subjects to life. Typical distance education models have suffered from a lack of faculty-student interaction and student-student interaction. In this model, however, students still learned within a classroom, meaning that levels of interaction, along with feelings of social presence and community, were increased while transactional distance was decreased.

In the following sections, the effectiveness of this model in reaching the goals of promoting student, graduate assistant, and faculty learning is explored. Ways in which the model could be improved are suggested, and implications for distance learning and social learning theories are discussed.

Faculty and Graduate Assistant Survey

The first VEC for Biorenewable Resources course was taught during the spring semester of 2008. By the fall semester of 2009, 14 collaborative, inter-institutional VEC classes had been taught among three participating institutions. At the end of the fall 2009 semester, a web survey was e-mailed to the nine participating faculty members and graduate assistants across the three contributing institutions. The survey was constructed to assess what the faculty and graduate assistants may have learned or gained from their experience working with VEC model, and what could be improved in future VEC and distance education courses. The survey consisted of five multiple-choice questions and nine open-ended questions that assessed each respondent's role and experiences with the course. Four of the five multiple-choice questions also had space for comments. Survey data were analyzed for frequencies and means, and comments were coded by theme.

Undergraduate Student Responses, Quiz Data, and Grades

To assess the impact of the VEC model on undergraduate students, the 33 students enrolled in the largest Fundamentals of Biorenewables course were asked to rate the video segments and provide comments. Student performance on quizzes was also used to help assess the impact of each segment on student learning. Two- to four-question quizzes were developed for each segment by the faculty member at the university where the study took place. Data were collected for each of the 89 segment quizzes that students completed for two reasons – 1) It made it possible to compare student learning and rating of recorded versus live lectures and 2) Some researchers have pointed out that distance education research has struggled to provide information about student learning and experiences throughout the course, instead of using only final grades and outcomes assessments (Gunawardena and McIsaac, 2004). Data collection included students' open-ended responses regarding each segment, the grades students received on each quiz, the number of attempts students took to complete the quiz, and a student rating of the segment.

Following a segment quiz, students were asked to rate the segment, giving it a letter grade of "A", "B", "C", "D", or "F". Student ratings of segments were recoded into numerical values based on a typical GPA scale. Segment ratings could range from A (4.0) to F (0.0). Student ratings were averaged for each segment, and segments were ranked by their mean rating. Quiz grades were converted to percentages. Student comments for each segment were organized by whether the segment was live or recorded, and analyzed using word search functions and identifying common codes and themes.

Results
Promoting Faculty Development

The nine faculty members who participated in course instruction agreed that faculty learning and faculty development had taken place. On average, the faculty members responded that expectations for documenting learning of current faculty members and graduate teaching assistants was "mostly met." One faculty member reported that "current faculty learned quite much in the process." Another reported learning how to use graduate assistants more effectively; others commented they had expanded their knowledge on technology usage. One faculty member remarked, "Class discussions helped me organize my own thoughts on emerging topics in the field," which helped her pursue her research more effectively. In addition,

five faculty members indicated participating with the VEC enabled them to recruit new graduates students, two leveraged new funds, two presented papers at a professional conference, and one had an article in progress. Six faculty reported expanding the content of their courses and were able to employ new teaching methods in the classroom. Finally, collaboration was increased among faculty both intra- and inter-university. Faculty members responded that they were collaborating, on average, "very effectively" with their colleagues at their institution, and "effectively" with colleagues at the other institutions for the purposes of the VEC.

Promoting Graduate Assistant Learning

Three graduate teaching assistants who responded to the survey reported serving as teaching assistants for at least one VEC course for Biorenewable Resources. The remaining graduate assistant reported that her role had focused on course development and revision. In open-ended responses, graduate assistants elaborated on these roles. At least two graduate students reported being responsible for each the following: quiz preparation, flagging questions, requesting video uploads, and grading. One graduate assistant reported the additional responsibility of developing and presenting two lectures.

One graduate assistant and five faculty members reported the VEC course enhanced graduate student recruitment. Through their experiences with the VEC courses, two graduate assistants collaborated with the faculty and/or graduate students outside their home institution, and all four increased collaboration with faculty at their home institution. Further, four graduate assistants were involved with the development, delivery, and evaluation of the course, and they indicated that their participation was effective in regard to these elements. Three graduate assistants reported using new teaching methods, one expanded the use of content in the course, and one student and six faculty responded that participating in the VEC had enhanced career opportunities for doctoral candidates. Graduate students expressed appreciation for being given opportunities to develop and deliver education materials, provide lecture topics and objectives, observe the amount of work and aspects that are required for developing a new course, apply previous knowledge, and interact with faculty. Overall, graduate assistants reported learning about biorenewables and teaching through their experience with the VEC.

Promoting Undergraduate Learning

After completing each course segment, students were asked to comment on the segment. Students commented on all 89 course segments, with an average of 8.66 students commenting per segment and a total of 771 comments throughout the semester. Overall, student comments tended to be vague. Eight of the 33 students in the class made comments for nearly every segment, and these students tended to give the same responses throughout the semester. Especially when making positive comments, students tended to provide very few examples. The comment "Good", for example, was made a total of 302 times, occasionally interspersed with comments such as "Very Good," (8 times) or "Ok," (45 times). Negative comments were usually followed with more specific examples. Negative comments were often related to problems students experienced with the quiz, but some negative comments did apply to the segment overall. As the semester progressed, students commented less often and comments became increasingly short and imprecise (one-word responses were often given). Because the one-word responses were prevalent, vague, given by the same students repeatedly, and stable throughout the semester regardless of the segment or whether the segment was live or recorded, these comments failed to lend insight into the effectiveness of the VEC model. Therefore, they were excluded from further examination. However, noting that "Good" was the most common comment regardless of segment or whether the lecture was live or recorded is important because it provides insight in recognizing that while some students may have struggled with certain segments, several students likely commented that the segment was "Good" and most of the class seemed not to care enough to take the time to comment at all.

The recorded lectures were complimented as being easy to understand, having good overviews, and having good examples. Conversely, students noted that it was occasionally difficult to stay focused on the lectures as they sometimes perceived them to be dry, choppy, lacking in contextual explanations, going "too fast," or jumping from one topic to the next. Students also noted that many of the quiz questions did not seem to correspond to the lecture material.

In regard to the live lectures, students liked the overviews and discussions. One student commented that the lectures all made sense. Conversely, another student perceived one segment as tough to follow. Several students found that lecture material was covered too quickly to write notes.

For both live and recorded lectures, students commonly expressed concern about the quizzes.

Virtual Education Center

Many students noted confusion about abbreviations used in the quizzes. Technical glitches with quizzes also caused problems for students; and students voiced disagreement with the quizzes 16 times, pointing out spelling errors and questioning the answer keys for some quizzes. Students indicated quizzes became more user-friendly as the semester progressed, suggesting faculty and students became more familiar with the technology.

Undergraduate Segment Quiz Attempts, Grades, and Ratings

Overall segment rating averages ranged from 3.35 to 3.81, and the mean rating across segments was 3.65. Mean segment ratings, quiz attempts, and quiz grades are summarized in Table 1. Live lectures were rated significantly higher than were recorded lectures (t = 3.47, p<.001), though the practical difference between the two styles was minimal: live lectures received an average rating of 3.68, compared 3.62 for recorded lectures. There were no significant differences between live and recorded lectures in regard to quiz grades or the number of quiz attempts.

Table 1. Quiz Attempts, Quiz Grades, and Segment Ratings for Live and Recorded Lectures					
	Quiz Attempts (n)		Quiz Grades (%)		Segment Ratings (0-4)
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Live Lectures	1.59	0.30	93.85	3.66	3.68	0.09
Recorded Lectures	1.6	0.34	93.58	4.38	3.62	0.06
t = 3.47, p<.001						

Improving the VEC

Faculty had suggestions for improving the content of the VEC course in relation to the course content, lecture partners, and opportunities for graduate assistants (Table 2).

Sixteen faculty comments related to improving the content of the VEC course. Two faculty suggested assigning the recorded lectures as homework instead of viewing them during class time. Four instructors suggested questions be developed about the lecture content and discussed during class time. Further, two instructors wanted more documentation of student learning. Four suggested that student ability varied greatly, and the lecture content was too easy for certain students and too hard for others. These faculty members noted that it would be beneficial to have tighter prerequisites and gear each class toward students with appropriate background knowledge and/or to have homework assignments that can meet the needs of students at varying levels of understanding of the course material.

Thirty-three faculty suggestions related to improving how lecture partners work together. Four faculty mentioned the importance of choosing faculty who could work well together; the importance of making sure that all participating faculty members had the necessary technology capabilities and IT supports services was mentioned seven times while six faculty commented on the importance of choosing faculty who were committed to devote their time to the VEC course. Eight of the nine faculty wanted collaboration between lecture partners to be increased; these faculty members said that it would be useful to have the lecturers from the different institutions work together on coordinating the focus of the courses.

Six faculty comments related to improving opportunities for graduate students. Three faculty members wrote that graduate assistants should have increased teaching responsibilities in future VEC courses to increase graduate assistant learning, facilitate inter-university collaboration and lessen faculty workload. Additionally, faculty pointed out that allowing them to teach would provide graduate assistants greater networking opportunities and increase the range of the VEC courses once these graduate students began obtaining faculty positions of their own. Further, faculty noted that graduate assistants have valuable ideas that could help guide the direction of the courses.

Discussion

The VEC model was an effort to share geographically diverse resources – while maintaining the best aspects of in-class lectures – allowing students to learn by observing their instructors experience and solve problems, and allowing passionate instructors to bring subjects to life. The VEC enabled instructors to fine tune the course to the unique needs,

Table 2. Faculty Suggestions for Improving the VEC	
Faculty Suggestions	**n**
Course Content:	16
-Assign lectures for out of class viewing	2
-Develop questions for in-class discussion	4
-Document student course performance	2
-Utilize tighter prerequisites	4
-Ensure class level and homework is appropriate for all students	4
Lecture Partners:	33
-Be purposeful in selecting lecture partners who will work well together	4
-Ensure partners have necessary technological capabilities	7
-Choose partners who are committed to teaching the course	6
-Partners should work to increase collaboration	8
-Partners should coordinate course focus	8
Opportunities for Graduate Assistants:	6
-Allow graduate students to lead some of the course instruction	3
-Utilize graduate students for facilitating inter-university collaboration	3

learner characteristics, and cultural backgrounds of the students at each site. It also allowed students to have increased control over their own learning by providing them with opportunities to ask questions inside and outside of the classroom and to interact with faculty members in person. Levels of interaction with instructors and other students were increased from the traditional distance education course since students still learned within a classroom; thus, feelings of social presence and community were increased and transactional distance was decreased, despite the fact that students were not able to directly interact with the faculty members lecturing from other institutions.

Promoting Faculty, Graduate Assistant, and Undergraduate Learning

Overall, the data show that the model developed was effective at promoting faculty, graduate assistant, and undergraduate learning: students enrolled in the course learned about biorenewable resources and documented this learning in segment quizzes and overall exams, while graduate students and faculty reported learning about biorenewable resources and delivering biorenewables courses efficiently using e-teaching tools.

Faculty not only experienced increased research activity, increased collaboration, and increased knowledge, but they also learned much about the VEC and potential options for improving future VEC courses. Faculty suggested some changes to course content and made important considerations for inter-university collaboration. Their experiences can be helpful not only for the participating faculty members but also could be useful in the future for faculty members intending to take on similar multi-university courses to compensate for the difficulties of traditional distance education courses.

Graduate teaching assistants gained valuable experience while participating in the VEC. The experiences and knowledge gained from this program will likely be useful for them as they finish their degrees, gain faculty positions of their own, and begin teaching courses – especially courses related to fields where faculty tend to be sparsely spread across the country. They gained experience developing and delivering courses, preparing quizzes, grading coursework, and collaborating with faculty both within the university and at the other participating institutions. Faculty acknowledged the importance of these experiences and suggested that graduate assistant learning could be increased if graduate students were given more opportunities for teaching.

Undergraduate students responded favorably to every segment of the course (the lowest average segment rating was above a B and the most common comment for each segment was "good"), although not all segments were rated equally. The number of quiz attempts students made was relatively stable and the quiz grades were high regardless of whether the lecture was live or recorded. This indicates that the distance portions of the course were just as effective at promoting student learning as were the portions of the course that were taught to them through direct, face-to-face interaction. The VEC model of having on-site instructors leading students at each site, then, appears to be an effective means of promoting student learning and overcoming the barriers common to distance education.

Improving the VEC and Theoretical Implications

Examining the responses and comments made by faculty, graduate assistants, and undergraduate students involved with the course provides insight into the VEC model so that suggestions for improving future VEC courses can be discussed. Faculty suggested that it would be useful to assign the online lectures for viewing outside of the classroom, have students bring questions to discuss during recitation-style class meetings, document student performance in the course, and utilize tighter prerequisites to ensure that the class level is appropriate for every student. Also, faculty suggested being very purposeful in selecting lecture partners and partners from other institutions so that all partners have the necessary technological capacities to upload and download lectures, and so all partners are equally committed to developing quality lecture content for the students at each institution. Finally, opportunities for graduate assistants could be increased if graduate assistants were allowed to instruct portions of the course and assist with inter-university collaborations.

Learner characteristics, which are noted in social learning theory (Hill et al., 2009), were brought up as an issue in the case of the VEC, but this emerged as a somewhat different issue from what might be the case in a traditional distance education class. Generally, learner characteristics refer to differences from student to student which might affect the way they learn and perform in the class. In the case of the VEC, instructors could interact with each student as needed and compensate for small student-student differences. However, faculty comments indicated that inter-institutional differences sometimes made it difficult to gear the class toward the diverse makeup of students:

prerequisite courses were part of the challenge, since prerequisite courses and requirements varied across institutions. Thus, in future VEC-style courses, instructors should discuss the variety of students they expect to see in the course and where they expect their students' current levels of knowledge to be. Distance education theorists emphasize paying attention to the delivery methods and accessibility of course content (Gunawardena and McIsaac, 2004), but the focus of this point is usually on the students who would access the content. In the case of the VEC, we assumed there would be no issue with accessibility, since students would not have to access the content themselves. However, problems arose with accessibility and having a common format, but primarily for the participating faculty members rather than for the students. Future VEC courses, then, might be improved by ensuring accessibility – for both students and faculty – before the course begins, and distance education theorists should note that in some models, such as the VEC, accessibility is more of an issue for faculty than students.

Distance education theorists stress striving to increase interaction and social presence (Gunawardena and McIsaac, 2004), while social learning theorists stress interaction and building a sense of community in distance education classrooms (Hill et al., 2009). In the case of the VEC, students and instructors at each site interact directly with one another; in fact, no students indicated a lack of interaction with other students or their professor was problematic, and no faculty members noted lacking interaction with their students, which is often noted in distance education studies (Taylor and White, 1991). The challenge, however, came in at the faculty level – faculty were interacting sufficiently with the students at their site, but interactions with other VEC faculty were limited. Faculty commented that increased collaboration with their partners at other institutions would improve future VEC courses. Distance education and social learning theorists might note that, when multiple faculty members are involved, interaction between them may be important, just as it is for students.

Recommendations for Future Research

For any distance education model to thrive, it must grow and change as technology and learning theory progress. Improving the VEC to further reduce transaction costs – perhaps by closer specification of technologies used and student background expectations – examining more advanced delivery formats, and comparing the teaching efficacy and costs of the VEC to other distance education modes are areas for future research.

Literature Cited

Angeli, C., N. Valanides and C.J. Bonk. 2003. Communicating in a web-based conferencing system: The quality of computer-mediated interaction. British Jour. of Educational Technology 34(1):31−43.

Bandura, A. 1977. Social learning theory. New York: General Learning Press.

Bandura, A. 1993. Perceived self-efficacy in cognitive development and functioning. Educational Psychologist 28(2):117-148.

Bernard, R.M., P.C. Abrami, Y. Lou, E. Borokhovski, A. Wade, L. Wozny and B. Huang. 2004. How does distance education compare with classroom instruction? A meta-analysis of the empirical literature. Rev. of Educational Research 74(3):379-439.

Biobased products and bioenergy vision and roadmap for Iowa. 2003. ISU Extension/CIRAS: www.ciras.iastate.edu/publications/IABioVisionRoadmap.pdf

Biomass Research and Development Technical Advisory Committee, United States Dept. of Energy and United States Dept. of Agriculture. 2002. Roadmap for Biomass Technologies in the United States.

Bourne, J.R., D.A. Harris and A.F. Mayadas, 2005. Online engineering education: Learning anywhere, anytime. Jour. of Engineering Education 94(1):131−146.

Brown, R.C. 2003. Biorenewable resources: Engineering new products from agriculture. Iowa State Press, Ames, IA.

Campbell, J.O., J.R. Bourne, P.J. Mosterman, M. Nahvi, R. Rassai, A.J. Brodersen and M. Dawant. 2003. Cost-effective distributed learning with electronics lab. Jour. of Asynchronous Learning Networks 8(3):5-10.

Campbell, J.O., J.R. Bourne, P. Mosterman and A.J. Brodersen. 2002. The effectiveness of learning simulations for electronics laboratories. Jour. of Engineering Education 91(1):81-87.

Coward, H.R., C.P. Ailes and R. Bardon. 2000. Progress of the Engineering Education. www.nsf.gov/pubs/2000/nsf00116/nsf00116.txt.

Crow, M.L., A. Pahwa, S.K. Starrett, K.J. Olciniczak and S.D. Sudhoff. 2000. Collaborative distance education in power engineering. Transactions on Power Systems 15(1):3-8.

Fahy, P.J. 2002. Use of linguistic qualifiers and intensifiers in a computer conference. The American Jour. of Distance Education 19(3):133-148.

Garrison, D.R. 2000. Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues. International Rev. of Research in Open and Distance Learning 1(1):1-17.

Garrison, D.R. and M. Cleveland-Innes. 2005. Facilitating cognitive presence in online learning: Interaction is not enough. The American Jour. of Distance Education 19(3):133-148.

Gomory, R.E. 2001. Sheffield Lecture – Yale Univ., January 11, 2001. Internet Learning: Is it real and what does it mean for universities? Jour. of Asynchronous Learning Networks 5(1):193-196.

Gunawardena, C.N. and M.S. Mclsaac. 2004. Distance education. In D.H. Jonassen, ed. Handbook of research for educational communications and technology (2nd ed.):355–395. Bloomington, IN: Association for Educational Communications & Technology.

Henning, W. 2004. Everyday cognition and situated learning. In D.H. Jonassen, ed. Handbook of research for educational communications and technology (2nd ed.): 43-168. Mahway: NJ: Erlbaum.

Hill, J.R. 2002. Strategies and techniques for community building in web-based learning environments. Jour. of Computing in Higher Education 14(1):67-86.

Hill, J.R., L. Song and R.E. West. 2009. Social learning theory and web-based learning environments: A review of research and discussion of implications. American Jour. of Distance Education 23(2):88-103.

Jonassen, D., M. Davidson, M. Collins, J. Campbell and B.B. Haag. 1995. Constructivism and computer-mediated communication in distance education. American Jour. of Distance Education 9(2):7-26.

Kamm, B. and M. Kamm. 2004. Biorefinery – systems. Chemical and Biochemical Engineering Quarterly 18(1):1-6.

Lim, D.H. 2004. Cross cultural differences in online learning motivation. Educational Media International 41(2):163-173.

Mayadas, A.F. 2001. Testimony to the Kerry commission on web-based education. Jour. of Asynchronous Learning Networks 5(1):134-138.

McIsaac, M.S. and C.N. Gunawardena. 1996. Distance Education. In D.H. Jonassen, ed. Handbook of research for educational communications and technology: A project of the Association for Educational Communications and Technology. 403-437. New York: Simon & Schuster Macmillan.

Merino, D. and K. Abel. 2003. Evaluating the effectiveness of computer tutorials versus traditional lecturing in accounting topics. Jour. of Engineering Education 92(2):189-194.

Mauve, M., N. Scheele and W. Geyer. 2001. Enhancing synchronous distance education with pervasive devices. Informatik 2: 1117-1122.

Moore, M.G. (Ed). 1990. Contemporary issues in American distance education. Oxford: Pergamon Press.

Moore, M.G. 1989. Three types of interaction. American Jour. of Distance Education 3: 1-7.

Muilenburg, L.Y. and Z.L. Berge. 2005. Student barriers to online learning: A factor analytic study. Distance Education 26(1):29-48.

Noble, D.F. (1999). Rehearsal for the revolution: Digital diploma mills, Part IV. http://communication.ucsd.edu/dl/ddm4.html.

Noble, D.F. (2001). Fool's gold: Digital diploma mills, Part V. http://communication.ucsd.edu/dl/ddm5.html.

Norman, D. 1993. Things that make us smart. New York: Addison Wesley.

Palloff, R. and K. Pratt. (1999). Building learning communities in cyberspace. Noboken, NJ: Jossey-Bass.

Peterson, G.D. and L.D. Feisel. 2002. E-learning: The challenge for engineering education. Proc. E-technologies in engineering education, a united engineering foundation conference. Davos, Switzerland. http://services.bepress.com/eci/etechologies/, 164-169.

Taylor, J.C. and V.J. White. 1991. Faculty attitudes toward teaching in the distance education mode: An exploratory investigation. Research in distance education 3(3):7-11.

Van Gerpen, J. 2005. Biodiesel processing and production. Fuel Processing Technology 86:1097-1107.

Wheeler, S. 2002. Student perceptions of learning support in distance education. Quarterly Rev. of Distance Education 3(4):5-22.

Woo, Y. and T.C. Reeves. 2007. Meaningful interaction in web-based learning: A social constructivist interpretation. The Internet and Higher Education 10:15-25.

An Exploration of College of Agriculture Ambassador Programs

Shannon Arnold[1]
Montana State University
Bozeman, MT

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

Abstract

Through this grounded theory case study, researchers sought to explore the structure and organization of College of Agriculture ambassador programs. The population consisted of all four-year public universities with an identifiable College of Agriculture ambassador program. A total of 31 ambassador programs and 74 participants were included in the final sample. The study revealed the common components of an ambassador program as leadership development, promotional activities, relationship building, student benefits and standardized college presentations. Participants reported gains in leadership skills, academic knowledge and self-confidence in the many events offered through the program. A structured retreat and continuous training were important leadership development components. Being a knowledgeable expert was a major responsibility as ambassadors were considered the "face" of the college, particularly in recruitment. There were many incentives reported that made involvement worthwhile, including networking with key people. It was hoped that ambassador programs can utilize results to improve organizational functions and overall student leadership.

Introduction, Literature Review and Theoretical Framework

Student leadership programs are found in all colleges and universities across the nation. These programs were not only to serve the mission of the university, but also enable students to develop personal and professional leadership skills (Astin, 1996). According to Ricketts and Bruce (2008), leaders were needed not only to build partnerships in communities, but to assume positions of leadership in life. Research has shown that while working to develop leaders for the 21st century, it was important to encourage skillful communication while promoting cooperation and understanding (Watt, 2003).

Research supports that leadership can be learned and there continues to be a growing number of formal leadership programs in higher education that promote skill development (Scott, 2004; Zimmerman-Oster and Burkhardt, 1999). Haber (2006) described formal leadership programs as *"intentionally designed learning opportunities aimed at expanding college students' knowledge, skills and values"* (p. 30). Leadership programs are a unique experiential learning approach that uses a variety of educational strategies including teamwork and service learning (Komives et al., 2006). Haber and Komives (2009) found that involvement in student organizations was a critical experience specifically to enhance leadership development skills, peer engagement, community involvement and self-improvement. Hoover (2004) found that participation in collegiate student organizations can be positively associated with college retention and satisfaction; student development; increased interpersonal skills; leadership development; communication, teamwork, organizational, decision making and planning skills; and volunteering and community service. Undergraduate programs aim to advance leadership skills in a variety of areas such as problem solving, decision making, empowerment, planning, organization and communication (Hoover, 2004). Example collegiate programs that influence leadership include freshman orientation, seminars, student body councils, leadership institutes, public relations activities and academic and student recruitment organizations (Zimmerman and Burkhardt, 1999).

Astin's (1999) student involvement theory predicted that learning increases when students are more involved in academic and social aspects while in college. An involved student is "one who devotes considerable energy to academics, spends a large amount of time on campus, actively participates in student organizations and activities and interacts often with faculty" (Astin, 1984, p.292). Student involvement

[1]Assistant Professor in Agricultural Education

as defined by Astin is *"the amount of physical and psychological energy that the student devotes to the academic experience"* (p.518). Focus is placed on behaviors, quality and quantity of involvement that facilitate student development. Co-curricular involvement was identified as a significant variable that affected leadership outcomes related to personality and self-concept. The amount of time spent engaged in co-curricular activities was positively correlated with producing leadership qualities and outcomes. Some of the specific measures found to positively affect co-curricular involvement were student-student interaction, student-faculty interaction, fraternity/sorority membership and volunteer work. Each of these factors significantly contributed to leadership growth and development commonly associated with participation in student organizations (Astin, 1999).

Leadership development has been extensively researched with many youth organizations, including FFA and 4-H. The positive impacts on leadership through youth involvement in camps, projects, conferences, councils and after-school programs have been documented (Connors and Swan, 2006; Smith et al., 2005; Boyd, 2001). Continued involvement in collegiate programs further develops these necessary life skills. Connors (1996, p. 312) stated, *"For those students who embark on a career in agricultural education, it is vitally important that they continue to gain valuable experience in a collegiate agricultural education organization."* Ewing et al. (2009) found that 434 (55%) of 789 College of Agricultural Sciences students surveyed participated in a collegiate organization and of those, 184 (23%) held an officer position. Research also revealed that all students felt that membership in a collegiate organization, whether they were an officer or not, positively contributed to leadership skill development. Dugan et al. (2011) researched the influences of program participation on university students' capacities for socially responsible leadership and found that according to those that participated in an individual leadership experience, *"the highest involvement rates were for lecture/workshop series, conferences and a single leadership class"* (p. 75). This study also identified the specific need for additional research on college student leadership development using qualitative inquiry into the nature of leadership experiences, the integration of learning experiences and high impact educational strategies. College of Agriculture (COA) ambassadors are a unique student leadership program aimed at improving the overall excellence of the college and creating awareness of agriculture. Ambassador programs are generally composed of agricultural student leaders who are directly involved with college promotion, recruitment and retention. Students serve as college representatives at a variety of public relations events and educate prospective students about university agriculture programs. Serving as the public face of Colleges of Agriculture requires ambassadors to emulate many leadership characteristics common in several leadership theories and approaches (Northouse, 2004).

Although there are varying differences in the mission statements of agricultural ambassador programs, common features include promotion of the college and its agricultural degrees, as well as recruitment and retention of students. The mission of agricultural ambassadors at Montana State University is to promote the COA by providing interactive experiences in careers and technologies as they relate to agriculture and natural resources (Ambassadors, n.d.). The purpose of the organization is to recruit and retain students in the COA, while instilling a life-long appreciation for agriculture and natural resources. Recently, the Montana State University COA ambassador membership dropped by 50% in one year due to lack of structure and guidance and the college was considering elimination of the program. Therefore, this exploratory study was conducted to better understand COA ambassador programs throughout the nation to gain ideas for program improvement and increase organizational effectiveness.

Purpose and Objectives

The purpose of this case study was to explore how College of Agriculture ambassador programs are organized. The study addressed the following objectives: (1) To describe the organizational structure of College of Agriculture ambassador student leadership programs and (2) to develop a grounded theory that illustrates the common components of College of Agriculture ambassador student leadership programs.

Methods and Procedures

The population for the study was four-year public colleges and universities across the United States with an identifiable College of Agriculture ambassador program. The sample consisted of college ambassador programs that were on the official attendance roster for the 2008 National Agricultural Ambassador Conference. A purposive sample was utilized as it allows for the choice of people who are "typical" of a group and can represent diverse perspectives (Leedy and Ormrod, 2009). The purposive sample included 36 universities and approximately 300 students that

attended the 2008 National Agricultural Ambassador Conference. This roster was regarded as a credible source of active and current ambassador programs representing all areas of the country.

In 2009 - 2010, Montana State University COA student ambassadors were assigned to research three or four university ambassador programs from the sample. Ten student ambassadors and the ambassador advisor from Montana State University served as primary researchers. A total of 31 ambassador programs were contacted and participated in the research. Five universities on the sample list were unable to be contacted and were eliminated. COA ambassador programs from the following states were included in the sample: Alabama, Arizona, California, Colorado, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Mississippi, Missouri, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Vermont and Virginia. The advisor of the ambassador program and at least one current student ambassador were interviewed from each school. This methodology allowed data to be collected from both the leader and student perspectives. Seventy-four participants were included in the final sample.

The Montana State University Institutional Review Board approved the study protocol and all participants provided verbal informed consent prior to participation in the study. Telephone interviews served as the primary data collection method in order to obtain an understanding of the structure and organization of ambassador programs. All researchers completed IRB training prior to conducting research. All researchers also participated in a training session conducted by a qualitative researcher to standardize interviewing techniques and procedures to improve the dependability of the study. The researchers interviewed both an advisor and at least one student ambassador from each school and posed open-ended questions. Participants were encouraged to discuss the components, experiences, structure and organization of the ambassador program. Interviews were conducted over a four-month period and ranged from 30 minutes to one hour in length with each participant. Questions were created based on the study objectives, Astin's student involvement theory (1999) and Haber and Komives (2009) research. Questions centered on the following topics: goals, mission and program objectives; application and selection process; guidelines and requirements; training programs; recruitment and retention activities; leadership and service activities; evaluation and reporting; promotion; funding and support; audiences; challenges and obstacles; collaboration; interactions;

peer engagement; community involvement; and self-improvement. All participants were asked to share thoughts and perceptions regarding their experiences and offer suggestions for program improvement.

Researchers utilized a semi-structured interview guide which allowed for freedom in questioning and exploration during the sessions (Holstein and Gubrium, 2003). This type of interview was chosen because it supported the ability for different researchers to present initially prepared open-ended questions, but also initiate probing questions based on the participants' responses (Wengraf, 2001). Researchers posed all interview guide questions and listened while taking field notes. This overall approach proved beneficial in acquiring detailed explanations to similarly prepared questions, but also increased the ability to analyze data for significant concepts. Field notes taken by the researchers included key points, direct quotes, impressions, central concepts and answers from each question to assist in transferability of data (Lincoln and Guba, 1985). Then, as a group, researchers combined interview data and field notes to construct the fullest understanding of data from the participants' perspectives. All data was triangulated among researchers after the interviews in order to increase the credibility and confirmability of the collected data (Lincoln and Guba, 1985). Additionally, each ambassador presented individual findings to the entire group so that the group could gain an overall understanding of the data. All field notes were content analyzed based on data and personal interpretation to discover commonalities. A final data audit was conducted by the primary researcher to examine the data collection and analysis procedures for bias and distortion to enhance dependability and confirmability (Lincoln and Guba, 1985).

Conventional content analysis was the primary data analysis method (Charmaz, 2003). This analysis derives coding categories directly from the data that allows for a richer understanding of the information. Strategies including a data coding process, constant comparisons and refinement of emerging ideas were applied to form the foundation of the analysis (Charmaz, 2003). All data and field notes were triangulated among researchers in a group process after the interviews in order to construct an understanding of the data, as well as increase the credibility and confirmability of the data (Strauss and Corbin, 1990). During data analysis, researchers allowed coding categories to emerge from the data rather than apply pre-conceived themes. Initial analysis began with individual open coding of interview field notes and then researchers coded together as a group to improve

inter-rater reliability (Leedy and Ormrod, 2009). Common codes were highlighted that were reflective of thoughts from participants. Codes were then sorted into themes based on relations and linkages to emergent coding categories. Synthesized themes were used to contextualize the data and establish clear concepts. A final data audit was conducted by the primary researcher to examine the data collection and analysis procedures for bias and distortion to enhance dependability and confirmability (Strauss and Corbin, 1990).

Results

The purpose of this case study was to explore how College of Agriculture ambassador programs are organized. Specific categories emerged from the data and were used to develop a grounded theory of a COA ambassador program (Figure 1). The main components of a COA ambassador program as reported by the majority of participants included leadership development, promotional activities, standardized college presentations, student benefits and building relationships.

Figure 1. Grounded theory of a College of Agriculture ambassador program
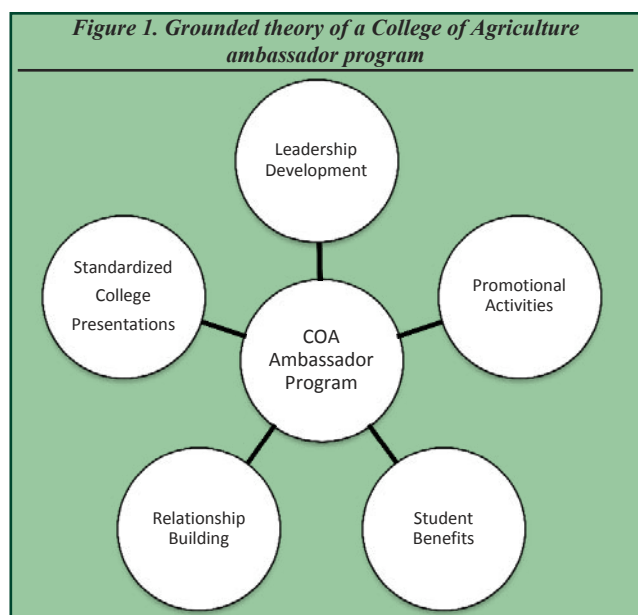
Leadership Development

Leadership development was a common theme identified by all ambassador programs. Nearly every program interviewed provided a leadership retreat before or shortly after the start of fall semester. Some schools even expanded the retreat to be held in collaboration with other agricultural ambassador programs from the same or neighboring states. Participants stated that this provided an opportunity to "complete team building activities, network with other ambassadors and gain ideas for the upcoming year."

The retreat was also considered the "optimal time to train new members and orient the team with the year's activities." A strong training program was considered "vital to the success of the ambassador program" as it provides members with an understanding of expectations, the ability to speak knowledgeably about university degrees and programs and the confidence to enter a classroom or event to represent the college. Additional topics included in the training were setting individual and group goals, providing members updated information on the university and college and scheduling major events. All programs except one sent representatives to the National Agriculture Ambassador Conference, which they said was a great way to "be proud of your own program while visiting with other ambassadors across the nation on ways to improve."

As part of the leadership development process, the selection of new ambassadors was also discussed. Many schools had a formal selection process where students were required to interview with current ambassadors and faculty for a specific number of positions, while others allowed open program enrollment. The size of ambassador organizations varied from 10 - 100 students. Participants described this process as a critical program component to ensure that student leaders were of high quality.

Promotional Activities

COA ambassador programs found that as the economy declines, so does the opportunity to travel and recruit at high schools and events across the nation. Ambassador groups have individually tried to overcome such obstacles by mainly targeting junior colleges, recruiting at regional activities, hosting invitational events and visiting secondary schools close to home. Participants identified public appearances as one of the most important parts of being an ambassador. On and off-campus activities and tours were common across all programs. Having positive public interactions and representation at university events was critical to promotion. Many were frequently involved in alumni events, fundraising functions and conventions as "the face of the College of Agriculture". One participant stated, *"We embrace the opportunity to be more involved in these events as it is vital that donors and others see and speak with current COA students. As agriculture ambassadors, we have a more visible appearance so others know not only what we do, but who we are."* Many programs were involved in hosting a large on-campus event for potential students once or twice a year. Being involved in on-campus agricultural events, such as the State FFA

convention, Ag Days and 4-H Congress, provided an excellent opportunity to reach large numbers of younger audiences without having to travel. One participant stated, *"We hope to strengthen our presence at these activities and let people know that we are available to provide tours and meet with students throughout the year. Additionally, while not as visible, we need to follow-up on these contacts with personal phone calls to potential students. Having someone know we are interested in them as an individual and a student could make a difference in where their tuition dollars are spent."*

As an event host, a few programs provided students with a group lunch while others had ambassadors meet with each prospective student individually. There were also opportunities for students to stay in the dorms or spend the night with an ambassador. A few schools instituted a more personal on-campus event that consisted of an application process to select extremely high caliber students that were then invited to campus. Priority for off-campus recruitment was placed on agricultural secondary students and junior colleges. These audiences were considered to be the most cost-effective since students already have an identified interest in science and agriculture. By targeting district FFA competitions, 4-H meetings and workshops, livestock judging contests, 4-H Congress, science competitions and other agriculture or science-based events, the audience was more likely to be interested and receptive to ambassador presentations than a group of general students. To reduce costs and the amount of time missed during the semester, ambassadors were encouraged to visit a high school within their home area during breaks. This increased receptiveness from the students due to already established school connections.

Standardized College Presentations

Standardized presentations about the college and its degree programs were utilized by all ambassador programs. Some have specific academic degree presentations for each department. Participants said it is important that presentations are "readily accessible and user-friendly." One participant stated, *"These presentations are valuable so that if a potential student arrives interested in agricultural education, then, for instance, an available plant science ambassador can open the agricultural education PowerPoint and knowledgeably walk through it with a student."* Ambassadors work closely with faculty to develop interactive presentations suitable for small and large groups. By offering presentations that create awareness of the opportunities available within the College of Agriculture, ambassadors can appeal to both traditional and non-traditional agricultural students.

Students Benefits

Advisors and students all agreed on the extensive time commitment required to serve as an ambassador. However, the personal and professional rewards of being an ambassador were numerous. Many commented on the leadership development, communication and self-confidence gained as a result of serving as an ambassador. Incentives varied among universities, but common examples included class credit, academic scholarships, early class registration, travel opportunities, or "incentive gifts", such as computer accessories, college paraphernalia, or journals, for top students. For many, the ability to travel and attend the National Agricultural Ambassador Conference were valued rewards. Nearly every school interviewed strongly recommended that all ambassador programs attend this conference to gain recruitment ideas and network with other students.

Building Relationships

Building relationships was commonly identified as an important factor for programs to succeed. The most important relationships were identified as those with faculty, the Dean, department heads and admissions. These relationships were critical to reach larger groups of students for recruitment and retention purposes. Having strong relationships with the Dean was important in all ambassador programs. By maintaining connections with this office, each program was able to "be recognized, utilized and funded as a recruitment resource." The majority of participants felt the Dean realized the importance of the ambassadors and their impact. Budgets were primarily funded through the Dean and ranged from $3,000 - $50,000 per program. Some schools were provided a set dollar amount per student in the college, while others were provided funds when needed. Overall, participants felt that they had access to adequate funds needed to complete their program goals. One common experience was to meet with the Dean annually to learn about the goals and outlook for the college and discuss how ambassadors can aid in the process.

There was variation in the activities that each program engaged in to build relationships with faculty and department heads ranging from panel discussions to class visits. Faculty commonly assisted in the nomination and selection process, provided access to non-agriculture students, promoted the activities of ambassador programs and served as key speakers. Other roles that faculty assumed were to assist in designing

science based presentations, offer technical content, provide updates on departmental news, academic programs and research and give recommendations of potential students and ambassadors. Working with the admissions office was also an important connection. Through this relationship, ambassadors had contact with potential agriculture students who contacted the campus instead of the college. Ambassadors worked closely with the admissions office to speak with students interested in agriculture and offer specialized tours. Some programs worked closely with the university tour guides and offered training on the College of Agriculture to have a better understanding of its programs.

Conclusions, Recommendations and Implications

Collegiate student organizations are a key component of Astin's (1984) theory of student involvement and undergraduate education. Organizations offer a multitude of opportunities for interactions and volunteerism which correlate with positive leadership development and personal growth. However, these programs must be structured around experiential learning to build essential leadership qualities (Komives et al., 2006). COA ambassador programs have the ability to engage students in a variety of activities that supplement the collegiate experience. Involvement in these social and academic activities has been proven to build critical leadership skills reported by Hoover (2004) and Astin (1999).

A structured retreat, coupled with continuous training, were important components to each ambassador program. This experience allowed the team to become a more cohesive unit, particularly for first year members to network with veteran ambassadors. Additionally, hosting a retreat or exchange with neighboring ambassador programs can help develop ongoing connections for the future. Being a knowledgeable expert about the college and university was a major responsibility. Developing standardized presentations about the university, the college and its related majors, degree options and collegiate organizations was necessary content knowledge. Additional information to answer frequently asked questions from potential students about campus events, financial aid and residence life would also be beneficial. During the year, training for public speaking should be emphasized so ambassadors can speak with confidence. A working binder of university and college information that is updated annually can educate new members to quickly gain the knowledge needed to be successful at the first events. Continuing

education should include the addition of guest speakers, specialists, industry members, alumni and administrators to the meetings. By bringing in experts, members can become familiar with all programs, versus just their own. While it is realistic to learn facts and figures, *"hearing firsthand about each program's benefits, current research, teaching, outreach and career opportunities can provide prospective students with additional information beyond the standard pamphlets."* Different types of teaching and learning activities must be included by the advisor to assist members in building educational proficiencies.

Promotional activities varied among programs, but all were searching for new ideas to decrease costs and increase outreach. Ambassador programs must develop a more economically feasible recruitment strategy to supplement face-to-face visits around the state. Hosting on-campus invitational events was one way to gain access to large numbers of potential students. A specific recruitment event with tours, workshops, industry speakers and meetings with faculty and students can be more cost effective than traveling. Having a structured career day where students can participate in a college class or spend time with ambassadors can make the event more personal and influential. Many participants also mentioned the importance of being involved with alumni events. Staying connected with alumni can help to multiply recruitment efforts and connect with remote communities. If provided with sufficient information, alumni could be used to promote the college at local events.

One participant stated, *"To be an agricultural ambassador takes an extensive amount of time, energy and effort in addition to schoolwork and other activities."* Yet, there were many benefits and incentives reported that made involvement worthwhile. The ambassador program's unique mission enables members to create key relationships within the college, university, industry and communities. Having an opportunity to work with leaders in these areas can build both personal and professional references for members. These relationships are beneficial as students search for internships and future careers. Traveling to local, regional, state and national events, including the National Agriculture Ambassador Conference, were valuable professional development opportunities.

For the majority of programs, the selection of new ambassadors included a personal interview process. This allowed members to identify the strengths of each applicant and their commitment to the organization. An informational session held for interested students prior to the application deadline could be valuable so they can learn about the requirements of the organization,

ask questions and evaluate their fit. Top applicants can then be selected for the interview process which could include stations to showcase personal strengths.

Interestingly, less than 10% of programs interviewed discussed retention of current students. Although all did not have this in their mission statement, it was a central component of the majority of programs. Participants stated that on-campus events and mentoring relationships were the main retention activities of the organization. The lack of detailed discussion about retention of student warrants further research. Questions about retention activities, focus, importance and impacts should be asked to determine what is currently being done.

After interviewing ambassador programs from across the nation, the Montana State University College of Agriculture Ambassadors implemented the findings to improve its current program. A complete restructuring in the areas of selection, training, activities and requirements was initiated. The selection of new ambassadors now includes a carousel interview process of various stations, such as team building, personal interview, case scenarios, student questions and impromptu speeches, judged by current Ambassadors and COA faculty. This not only assists in recruiting quality students, but provides exposure of the program to other departmental faculty. Retreats and trainings have been re-designed to build knowledge, leadership and presentation skills. An annual weekend retreat, new ambassador trainings, socials, a training binder, impact statements and leadership updates have been established as requirements. In 2011, the Montana State University ambassadors worked in collaboration with neighboring states to create a two day Northwest Regional Ambassador Conference that included professional development, educational workshops, campus tours and idea exchanges. Modeling the program after other universities, the ambassadors developed a recruitment and retention plan to be more effective with available funds. This included attending regional events, increased participation in on-campus and alumni events and the development of a public COA off-campus tour. A professional, quality recruitment board and retractable display banners were developed with a graphic designer to promote a unified college image. Improved relations with the Admissions office through Phone-A-Thons, the development of a COA tour booklet and training of university representatives on the COA has created more educated recruiters overall. Recruitment items including Jeopardy, Plinko and a miniature golf game have also assisted in generating more booth interest at career events. Retention activities continue

to be a work in progress with ideas for more student-faculty interactions and events, collaborative organizational activities, a peer mentoring program, utilization of community alumni and increased public presence at agricultural events. Student involvement in undergraduate organizations has mutual benefits both to the student and the college. Students develop a greater appreciation for the college which can lead to overall increased retention for the university (Hoover, 2004). Advisors should continue to promote student involvement and co-curricular activities to enhance the total collegiate experience for all.

Literature Cited

Ambassadors. (n.d). Retrieved from http://ag.montana.edu/students/agambassadors.htm.

Astin, A.W. 1984. Student Involvement: A developmental theory for higher education. Jour. of College Student Personnel 25:297-308.

Astin, A.W. 1993. What matters in college? Four critical years revisited. San Francisco: Jossey Bass.

Astin, A.W. 1999. Student involvement: A developmental theory for higher education. Jour. of College Student Development 40(5):518-529.

Astin, H. July-August 1996. Leadership for social change. About Campus, 107.

Boyd, B. 2001. Bringing leadership experiences to inner-city youth. Jour. of Extension 39(4): Retrieved from http://www.joe.org/joe/2001august/a6.php.

Charmaz, K. 2003. Grounded theory: Objectivist and constructivist methods. In Denzin, N.K. & Lincoln, Y.S., Strategies of Qualitative Inquiry. Thousand Oaks, CA: Sage.

Connors, J.J. 1996. Current status of agricultural education organizations. Proceedings of the National Agricultural Education Research Meeting, USA 23:312-320.

Connors, J. and B. Swan. 2006. A synthesis of leadership development research in agricultural education: 1988-2003. Journal of Agricultural Education 47(2).DOI:10.5032/jae.2006.02001.

Dugan, J.P., C.W. Bohle, M. Gebhardt, M. Hofert, E. Wilk and M.A. Cooney. 2011. Influences of leadership program participation on students' capacities for socially responsible leadership. Jour. of Student Affairs Research and Practice 48(1):65–84. DOI:10.2202/1949-6605.6206.

Ewing, J., J. Bruce and K. Ricketts. 2009. Effective leadership development for undergraduates: How important is active participation in collegiate organizations? Jour. of Leadership Education 7(3):131-143.

Haber, P. 2006. Structure, design, and models of student leadership programs. In S.R. Komives, J.P. Dugan, J.E. Owen, C. Slack and W. Wagner (Eds.), Handbook for Student Leadership Programs (pp. 29-51). College Park, MD: National Clearinghouse for Leadership Programs.

Haber, P. and Komives. 2009. Predicting the individual values of the social change model of leadership development: The role of college students' leadership and involvement experiences. Jour. of Leadership Education (7)3:133-165.

Holstein, J. and J. Gubrium (Eds.). 2003. Inside interviewing: New lenses, new concerns. Thousand Oaks, CA: Sage.

Hoover, T.S. 2004. Leadership characteristics and professional development needs of collegiate student organizations [Electronic version]. NACTA Jour. 48(2).

Komives, S.R., J.P. Dugan, J.E. Owen, C. Slack and W. Wagner (Eds.). 2006. Handbook for student leadership programs. College Park, MD: National Clearinghouse for Leadership Programs.

Leedy, P.D. and J.E. Ormrod. 2009. Practical research: Planning and design (9th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Lincoln, Y.S. and E.G. Guba. 1985. Naturalistic inquiry. Beverly Hills, CA: Sage.

Northouse, P.G. 2004. Leadership theory and practice. Thousand Oaks, CA: Sage Publications.

Ricketts, K.G., J.A, Bruce and J. C. Ewing. 2008. How today's undergraduate students see themselves as tomorrow's socially responsible leaders. Journal of Leadership Education 7(1):24-41.

Scott, D. 2004. Are campus leadership programs producing the leaders society needs? NetResults. Retrieved from http://www.naspa.org/membership/mem/pubs/nr/default.cfm?id=1351.

Smith, T., L. Genry and S. Ketring. 2005. Evaluating a youth leadership life skills development program. Jour. of Extension 43(2). Retrieved from http://www.joe.org/joe/2005april/rb3.php.

Strauss, A. and J. Corbin. 1990. Basics of qualitative research. Newbury Park, CA: Sage.

Watt, W.M. 2003. Effective leadership education: Developing a core curriculum for leadership studies. Jour. of Leadership Education 2(1):13-26.

Wengraf, T. 2001. Qualitative research interviewing: Biographic narrative and semi-structured methods. Thousand Oaks, CA: Sage.

Zimmerman-Oster, K. and J.C. Burkhardt. 1999. Leadership in the making: Impact and insights from leadership development program in U.S. colleges and universities. Battle Creek, MI: W.K. Kellogg Foundation.

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

When Students Design Learning Landscapes: Designing for Experiential Learning through Experiential Learning[1]

Gail Hansen[2]
University of Florida
Gainesville, FL

Abstract

Learning landscapes such as teaching arboretums and demonstration gardens are effective learning sites for teaching and extension activities. Landscape design students in environmental horticulture recently participated in the planning and design of a demonstration landscape on the University of Florida campus. The class assignment, which is grounded in experiential learning theory, helped students understand the basics of experiential learning and the application of it to the design of learning landscapes. This article presents the framework for developing and designing learning landscapes by linking the experiential learning process to the landscape design process and to key design features of learning landscapes. Key questions are also provided for instructors and program directors that are considering designing and implementing a learning landscape as a class project or for their program. In this case study students worked with campus administration, faculty committees, facilities and planning and campus extension programs to gather information and ideas to create a design that reflected the university needs and the educational goals of extension. The students demonstrated their understanding of experiential learning and the experiential learning/design process link by applying the concept and creating a practical, effective and visually pleasing demonstration landscape.

Introduction

Landscape design students in Environmental horticulture participated in the planning and design of a learning landscape for the new Institute of Food and Agricultural Sciences (IFAS) Center on the University of Florida campus. The project presented a unique opportunity for students in landscape design to learn about the link between experiential learning principles and the landscape design process and to apply those principles in the planning and design of a demonstration landscape for their campus. IFAS administrators expressed the desire for a landscape that reflected the mission, values and educational goals of the IFAS program. To support the IFAS message the landscape around the center was envisioned as a demonstration garden for the principles of Florida-Friendly Landscaping™ (FFL), a trademarked joint venture between the University of Florida, IFAS and Florida Department of Environmental Protection. The goal of the FFL program is to educate Floridians about the protection and conservation of water resources through sustainable landscape design and maintenance practices.

Experiential Learning and Landscape Design

Experts in learning and attitude and behavior change advocate experiential (hands-on) learning as the most durable and effective strategy for producing citizens dedicated to environmental protection through design (Calkins, 2012). Experiential learning theory defines learning as the process where knowledge is created through concrete experience and abstract conceptualization, and transformed through reflective observation and active experimentation in a cyclical manner that continues until the conclusion of the project (Kolb, 1984). Experiential learning theory also correlates with andragogy, an adult learning theory, which proposes that adults are concerned with material that is directly relevant to them and they prefer a problem-solving learning environment that challenges them to find solutions (Knowles, 1984; Myers and Roberts, 2004). Both theories connect with the problem-based learning environment that is the underpinning of landscape design courses. The

Table 1. The connection between experiential learning and landscape design	
Experiential Learning and Landscape Design	
Experiential Learning Process	**Landscape Design Process**
Concrete Experience: students experience a direct encounter which gives them a common frame of reference	**Planning Phase** **Site inventory:** direct experience on the site **Client interview:** direct interaction with the client to learn client needs and wants
Reflective Observation: students reflect on their experience and internalize their concrete experience	**Site analysis:** discussion and written description of the opportunities and constraints presented by the site and the client
Abstract Conceptualization: students create rules and strategies related to their experience. The instructor adds additional information to guide the framing of the experience within the rules	**Design Phase** **Program development:** design strategies and concepts are developed and features proposed for the site
Active Experimentation: students apply the strategies and rules to the activity and project	**Design Development:** Strategies and concepts are used to guide spatial organization of design features

problem-solving design process begins with a site visit to experience the concrete and tangible qualities of a site and identify the opportunities and constraints for site design. The knowledge gained is transformed through a process of site analysis (reflection), program development (conceptualization) and design development (experimentation), into a design that can be created in the built environment. Table 1 outlines the relationship between the experiential learning process model developed by Kolb (1984) and the landscape design process.

In this case study the theoretical framework of experiential learning applied to the in-class design process and to the project the students were designing. In other words, the students used their experiential learning experience to design a space for experiential learning.

The Use of Demonstration Landscapes as Learning Experiences

Research supports the use of demonstration landscapes for learning. Several studies provide evidence that learning in natural environments improves creative problem solving and the recall of information (White and Stoecklin, 1998). Research suggests that adults retain more information and are more likely to adopt certain behaviors if they learn in experiential settings that are relevant to them (Myers and Roberts, 2004). Agencies and educational institutions that are associated with environmental protection and conservation often use demonstration landscapes in their social marketing campaigns aimed at changing homeowner's perceptions and encouraging adoption of new behaviors (Miller et. al., 2004). Based on these and other studies on environmental behavior and attitude, a demonstration landscape was chosen as the appropriate experiential setting to encourage

behavior change and modification of landscaping practices for the Florida-Friendly Landscaping™ program. The use of a demonstration garden was also encouraged by studies suggesting that the experiential setting of public demonstration gardens is one of the primary means by which adults learn about environmental concepts and transform their perspective of the environment (Bush-Gibson and Rinfret, 2010). Attitudes about the environment are also linked to ecological knowledge and attitudes that are formed through direct experience with nature are believed to be better predictors of behavior (Pooley and O'Conner, 2000). The demonstration landscape setting is also appropriate for discovery learning, an experiential style of learning that is personal and self-paced and allows learners to create meaning and construct knowledge through discovery (Wake, 2007). This concept was important to the use of a demonstration landscape for the FFL program because visits to the landscape will be primarily self-paced and discovery oriented with the proposed use of smart phone technology to access information while in the landscape.

The FFL demonstration landscape is designed to provide an opportunity to experience the first two phases of the experiential learning process. Knowledge is created through the concrete experience (phase 1) of a visit to the landscape to view the displays and reflection (phase 2) on the experience, is self-directed and depends on the visitors initiative to think about the experience. However, phase three (abstract conceptualization- creating rules and strategies) is not guided by an instructor and the visitor/learner must form their own rules or strategies for incorporating the FFL principles in their home landscape and follow through by actively incorporating (phase 4), the ideas from the displays in their yards.

Methods

Designing the Demonstration Landscape

This case study describes an assignment that was completed as part of a standard landscape design course and is therefore deemed exempt from IRB approval under federal regulation 45 CFR §46.101(b). Designing the demonstration landscape began with the planning phase that included a site inventory and

client interview and concluded with an analysis of the information learned. The client for this project included IFAS university administrators, IFAS facilities staff, and UF Senate committees associated with design and planning for the university.

The Planning Phase- Concrete Experience and Reflective Observation

Students first met with IFAS Facilities Planning and Operations to visit the site and learn about the project scope. The planning staff discussed the vision of IFAS administration, the site constraints and the functional and spatial requirements of the project. Students then participated in the university approval process for new construction projects by attending faculty committee meetings, including the Lakes, Vegetation and Landscaping Committee and the Land Use and Facilities Planning Committee. In the committee meetings they learned about campus policies for environmental protection and sustainable design standards for new construction. They were also introduced to the campus sustainable sites initiative for landscaping and grounds that promotes the development of an environmentally healthy campus. After site approval in the committees the students met with the Florida-Friendly program staff to learn about the public education mission for Florida-Friendly Landscaping™. The educational message of the FFL program recommends the use of nine landscaping principles to protect and conserve Florida water bodies, including: 1) use the right plant, in the right place, 2) water efficiently, 3) fertilize appropriately, 4) use mulch, 5) attract wildlife, 6) manage yard pests responsibly, 7) recycle yard waste, 8) prevent stormwater runoff, and 9) protect the waterfront. The FFL staff expressed a desire to demonstrate these principles through a variety of displays and signage in the landscape.

Pre-design planning included writing a purpose statement with program goals and objectives, determining the educational message and creating a program based on the visitor needs, site resources and the proposed displays. The students developed the following purpose statement: *"The purpose of the demonstration landscape is to teach homeowners about Florida-Friendly landscape principles and demonstrate how the principles can be used in their home landscapes. The goal is to encourage homeowners to use the nine landscaping principles by creating a visually pleasing and ecologically healthy landscape that will inspire visitors to replicate the design features in their own yard."* The objectives included:

1. Create a visually pleasing design with informative displays to attract visitors.
2. Design the landscape for all visitors with an accessible pathway.
3. Create simple yet appealing displays that can be replicated by homeowners.
4. Explain the FFL principles with attractive signage and user-friendly technology.

Students analyzed the site and visitor needs to determine the specific learning displays and other site features needed to convey the educational message and accommodate the visitor. They determined that FFL principles #1) right plant, right place, #4) use mulch and #5) attract wildlife, could be demonstrated in plant bed displays with signs. They also decided principles #2) water efficiently, #7) recycle yard waste and #8) prevent stormwater runoff, could be demonstrated with site feature displays. The remaining principles, #3) fertilize appropriately, #6) manage yard pests and #9) protect the waterfront, would be described with educational signage. The focus of each principle provided direction for the type of displays and signs that would best convey the information.

The Design Phase – Abstract Conceptualization and Active Experimentation

Each student created a landscape design that incorporated the Florida-Friendly principles with various plant displays and features. The project requirements included 1) a front entry plaza that would accommodate approximately 100 people, 2) an accessible pathway through the garden, 3) plant buffers around an open outdoor pavilion, 4) trees to decrease the scale of the two-story building and provide shade, 5) a large cistern and micro-irrigation demonstration area, 6) a rain garden and butterfly garden, 7) plant beds to demonstrate right plant-right place and 8) locations for educational signs at each demonstration area. The project also included the design of educational sign prototypes. The purpose of the sign project was to encourage students to think about the most important points to convey to the visitors and to learn how to develop and write educational messages. They also learned about the importance of good quality graphics and effective text to attract and hold the attention of visitors.

Student Designs – What Worked, What Didn't

Although the student projects were similar in layout based on site restrictions they varied widely in details and materials. Some students opted for curvilinear

pathways and more organic designs, while others designed straight pathways with a geometric layout of right angles. Pathway materials included concrete, pavers, brick and stone. The most common mistake beginning design students make is to overdesign- using too many features and costly materials- which also leads to budget over-runs. Revisions to their conceptual designs typically included reducing the size of the entry plaza and number of walkways and choosing a more inexpensive paving material. Plant choices, planting plans and spatial organization of the displays were generally well done and the designs exhibited a good understanding of how visitors would move through the space and the learning sequence for the displays.

IFAS planning staff, the project architect and FFL staff reviewed the completed projects and noted the best features of each. The final plan was produced by an FFL staff member who incorporated different features from all the student projects into a master plan. The final plan included a meandering looped pathway that circled a butterfly garden, several plant beds, a rain garden and a rectangular plaza at the front of the building. Although the original proposal was for the students to help with the installation, liability issues and timing prevented students from participating and the plan was installed by a professional landscape contractor.

After installation, plant identification signs with QR codes (quick response codes) were developed by the IFAS Center for Landscape Conservation and Ecology. Visitors who scan the QR codes on the plant identification tags can view additional plant information, including growing requirements and a photo of the mature plant. The FFL staff also used ideas from the prototype signs designed by the students to create large graphic signs describing each of the nine FFL principles.

Making Connections- Learning, Design, and Landscapes

The class project was carefully structured and implemented to teach students about experiential learning by using the experiential learning process and connecting it

to the design process to create an experiential learning site. Table 2 illustrates the connection between the phases of experiential learning, the design process activities, and the key site concepts and features.

The class began each stage in the design process with a discussion about how the activities they were engaged in to design the landscape fit the experiential learning process. For example, in the planning phase the students were asked to describe why the site inventory and the stakeholder meetings were considered a concrete experience. They were also asked to explain why the site analysis was an exercise in reflective observation. In the design phase the students included a list of the site features they intended to use and in the individual desk critiques they were required to explain the strategies, or concepts, they were proposing. For example, each student had to justify the location of each feature, such as a birdbath in the butterfly garden and why they were including it in the plan. Their justification had to include how it promoted FFL principles and what the visitor to the garden would learn from the display. At the beginning of the project students were told that future classes would be using the garden for learning so they should consider their own experience in learning about FFL principles and think about what was helpful to them. In this project

Table 2. The link between experiential learning phases, the design process and site design for learning landscapes	
Experiential Learning/Design Process and Site Design for FFL Learning Landscape	
Experiential Learning/Design Processes	**Site Design Concepts and Features**
Phase I: Concrete Experience Design Activities Site inventory: 1. Buildings, vegetation, drainage Stakeholder meetings: 1. Planning policies 2. Missions and educational goals 3. Committee approvals 4. Budget and costs	**Phase 1: Pre-design Planning** Key site concepts: 1. Purpose of demonstration landscape 2. Educational message 3. Goals and objectives 4. Visitor/learner needs 5. Desired displays 6. Site resources
Phase 2: Reflective Observation 1. IFAS mission 2. FFL mission and educational goals 3. Site opportunities and constraints 4. Stakeholder needs and wants	**Phase 2: Site Analysis** 1. Review site inventory and meeting notes 2. Group discussion- solutions to site constraints, use of site opportunities 3. Group discussion-stakeholder and project goals
Phase 3: Abstract Conceptualization Site features related to the educational goals 1. Display/feature requirements 2. Spatial requirements 3. Visitor needs	**Phase 3: Program Development** 1. Loop pathway and educational signs 2. Plant displays and rain garden 3. Cistern and micro-irrigation 4. Wildlife/butterfly garden
Phase 4: Active Experimentation Activities 1. Conceptual designs 2. Refine concepts (cycle back to Reflective Observation) 3. Final Master plan design 4. Approval of stakeholders	**Phase 4: Design Development** 1. Spatial organization, display location 2. Pathway layout 3. Display/feature design 4. Sign/educational material design

the students also took on the role of a teacher; by creating a learning environment that required them to incorporate a learning process and an understanding of how people learn.

Design Features of Learning Landscapes

Learning landscapes include a few important features that distinguish them from a typical landscape design. The intent of the landscape is to teach, so it is important to provide access and displays that clearly illustrate concepts or principles related to the educational mission. The most important learning features are a series of easily accessible educational displays and signs. Basic functional considerations include pathway design, visitor safety and comfort and maintenance access. Aesthetic considerations include creating attractive displays and a visually appealing and interesting site organization.

The FFL demonstration landscape includes an accessible pathway that takes the visitor through a variety of planting displays in different sun and shade conditions. Each bed features Florida-Friendly plants and mulch to demonstrate the importance of locating the right plant in the right place and the proper use of mulch. The path circles a wildlife/butterfly habitat with host and nectar plants and a rain garden with appropriate plants to demonstrate using water efficiently and preventing stormwater runoff. The landscape also includes a large cistern to store rainwater and a micro-irrigation system display to demonstrate another technique for using water efficiently. The original plan included a compost station to demonstrate recycling yard waste, however, the logistics of maintaining a compost pile made it impractical so it was decided to use signage instead. The class project resulted in an attractive landscape that fits with the campus aesthetic and the mission of IFAS extension and also clearly demonstrates the Florida-Friendly Landscaping™ principles.

Results and Discussion

After students completed the design of the demonstration landscape they were asked to summarize their experience and recommend some key questions to ask about the use of demonstration landscapes in an educational program or as a class project. The students felt that connecting the experiential learning process to the design process was very helpful to understand the purpose and theoretical concepts that applied to learning landscapes. After discussion of several issues the students narrowed the list to eight key areas.

Key Questions for Designing and Implementing a Learning Landscape

Key questions that should be addressed when developing the design include pre-design questions about feasibility and usefulness and design related questions about presentation and functionality. If you are considering the use of a learning landscape for your program, ask the following questions to determine if it will suit your education mission and goals:

1. Is the experiential learning/discovery process appropriate for the targeted learner?

2. Can the topic of your educational goals be demonstrated in tangible displays?

3. Is this the best learning method to promote your message and reach your objectives?

4. Does the site have the characteristics needed to develop appropriate displays?

If you are contemplating using the design of a demonstration landscape as a class project there are also some key questions you should ask about the feasibility of the project, including:

1. Are the students learning skills appropriate for an experiential learning format?

2. Will you have the support and cooperation of administration and planning?

3. Do you have an appropriate site and facilities for a demonstration landscape?

4. Do you have a well-defined program that will provide the foundation for the design?

Summary

Students engaged in the experiential learning activities of design can apply their experience and knowledge gained to the design of a learning landscape. Outdoor settings are one of the best examples of an environment that provides opportunities for learning through experience and reflection. Most outdoor learning areas, such as gardens and landscapes, offer many qualities that make them useful for a variety of teaching activities. Pre-design planning should always start with development of a purpose statement that includes the program goals and objectives, determining the educational message and creating a program based on the visitor needs, desired displays and site resources. The features included in the design will be determined by the educational concept and message of the program. University settings provide a variety of opportunities to design and develop experiential learning environments, in the outdoors and in the classroom. Class projects also provide an avenue for students to learn about the policies and procedures that can influence the final design. Both students and campus administration benefited from

the student involvement in the FFL demonstration landscape project.

Literature Cited

Bush-Gibson, B. and S. Rinfret. 2010. Environmental adult learning and transformation in formal and non-formal settings. Jour. of Transformative Education 8(2):71-88.

Calkins, M. 2012. The sustainable sites handbook. A complete guide to the principles, strategies, and practices for sustainable landscapes. NJ: John Wiley & Sons, Inc.

Knowles, M. 1984. Andragogy in action. San Francisco: Jossey Bass.

Kolb, D.A. 1984. Experiential learning: Experience as the source of learning and development. Upper Saddle River, NJ: Prentice Hall.

Miller, B., W. Conway, R. Reading, C. Wemmer, D. Wildt, D. Kleiman, et. al. 2004. Evaluating the conservation mission of zoos, aquariums, botanical gardens, and natural history museums. Conservation Biology 18: 86-93.

Myers, B. and G. Roberts. 2004. Conducting and evaluating professional development workshops using experiential learning. NACTA Jour. 48(2): 27-32.

Pooley, J. and M. O'Conner. 2000. Environmental education and attitudes: Emotions and beliefs are what is needed. Environment and Behavior 32(5): 711-723.

Wake, S. 2007. Designed for learning: applying "learning-informed design" for children's gardens. Applied Environmental Education & Communication 6(1): 3-38.

White, R. and V. Stoecklin. 1998. Children's outdoor play and learning environments: Returning to nature. MO: White Hutchinson Leisure & Learning Group.

Mark Your Calendars Now!
June 25 - 29
2013 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

An Exploratory Study of Computer-Based Instruction Utilizing iFARM Modules in a College Introductory Agronomy Course

Annie L.E. Davis[1]
Lori J. Unruh Snyder[2]
Kathryn Orvis[3]
Neil A. Knobloch[3]
Purdue University
West Lafayette, IN

Abstract

The purpose of this study was to describe an educational agronomy curriculum developed for an introductory crop production course at a land-grant university. The iFARM (Interactive Fundamental Agricultural Resource Modules) modules were created to display a similar teaching platform for an introductory agronomy course, which is offered in both the Fall and Spring semesters. The Spring course is often limited to inside labs due to inclement weather. The iFARM modules were a set of 13 agronomy-related modules developed to provide educators an alternative form of instruction to enhance students' experiences. Five semesters of 226 individuals consisting of primarily freshman or sophomore males from the College of Agriculture completed a questionnaire at the end of the course. Of the 226 students, 79% reported the modules were useful for their learning; while 21% thought that the modules did not contribute to their learning in the course. When comparing students' perceptions of the learning experiences using post-test scores for the Fall and Spring semesters average post-test scores, there was a noticeable difference which could be attributed to the modifications in instruction from the Fall semester to the Spring semester (d = 0.83, large effect size). The study concluded that students experienced an overall positive learning experience while using the iFARM modules and the modules were somewhat effective in teaching the participants new material.

Introduction

Educators are under increasing pressure to reexamine their teaching positions as well as to improve the development of effective teaching strategies (Miller and Powell, 1998; Miller, 1997; Diebel et al., 1998). Students need to be provided with choices in instructional methods to maintain motivation and attention and to address the different learning styles (Miller, 1997; Seiler et al., 1997). College undergraduates realize the importance of computer literacy and they are growing up in an information-based society that requires knowledge of computer technologies to succeed both personally and professionally (Sanders and Morrison-Shetlar, 2001). Online-learning using games, simulations and case studies have tremendous potential to initiate and link opportunities for students and educators to real-world situations. These experiences enable students to achieve higher-order thinking processes. Decision-making and problem-solving skills are essential elements of learning within the agricultural science disciplines. By the creation of multi-media replicas that demonstrate real-world experiences students and educators benefit directly by combining lecture with practice.

Technology in the university classroom has made great strides in the area of presentation of materials for both educators and students. Those educators that have explored this resource have experienced a rapid transition from typical lecture type formats, to interactive student centered Internet courses (Oliver et al., 1998). This transition requires instructors to develop new skills for curriculum development and delivery and to keep up-to-date on the quickening pace of technology adoption and change in the computer areas (Diebel et al. 1998; Miller and Powell, (1998). James et al., (2000), in a project involving

applications of technology to teaching science, mathematics, and technology, stated that strategies for improving instruction should include "active learning environments." Milheim (1995) stated that *"interactivity is one of the most important factors in the design and development of effective computer-based instruction materials"* (p. 225). Born and Miller (1999) and Whittington (2004) stressed that students learn what they practice. By operating computers to solve problems and learn content, students obtain valuable experience they need to perform optimally in the agricultural work-place.

In an active learning setting, technology has the power to support students and teachers in obtaining, organizing, manipulating, and displaying information (Means and Olson, 1994). The Internet and a variety of emerging communication, visualization and simulation technologies now offer students active learning experiences ranging from experimentation to real-world problem-solving. Students say they are motivated by solving real-world problems, they often express a preference for doing rather than listening (Lombardi, 2007). The use of realistic activities within online learning environments has been shown to have many benefits for learners in online units and courses; many courses have been based on complex and sustained scenarios and cases, where students become immersed in problem-solving within realistic situations resembling the contexts where the knowledge they are learning can be realistically applied (Herrington et al., 2003).

There has been much criticism about science, technology, engineering and mathematics (STEM) education not focusing enough on hands-on application, especially in authentic real-world contexts (Pierrakos et al., 2010). Past research has indicated that most students show little evidence of using critical thinking abilities when solving problems (Cano and Martinez, 1991). Furthermore, researchers have identified cognitive deficiencies that characterize poor problem solvers, with a passive approach to learning as an underlying causal factor (Chance, 1981; Rudd et al., 2000). Rushton and Jenson (2005) and Fuerestein (1980) believed that intellectual capacities were not entirely determined by heredity and that cognitive performance could be positively influenced. Real-world application is where relevant problems are introduced at the beginning of instruction and used to provide the context and incentive for the learning that ensues.

Computer-based instruction allows self-paced learning and evaluation, offering

students some immediate feedback on their abilities to comprehend the information. Computer technology is very different from any other teaching tool we have ever known (O'Kane and Armstrong, 1997). An interactive approach to instruction which employs hands-on activities should help students gain success in the classroom. The modules: Interactive Fundamental Agricultural Resource Modules or "iFARM" were created to find a solution to help students learn scientific principles while thinking critically (Unruh Snyder et al., 2009). The iFARM modules provided students with an engaging way of learning using examples of how to apply content in real-world context which helped them pursue education and careers in plant sciences. The iFARM modules are a set of 13 agronomy related modules.

Conceptual and Theoretical Framework

The conceptual framework for this study was based on the six levels of Bloom's Taxonomy model. The purpose of the model was to encourage students to "climb" higher in their level of thinking; meaning that once one level is mastered the student progresses to the next while never forgetting what they have already mastered. In the 1990's, the model was restructured in order to update the taxonomy to make it more relevant for the 21st century student and teacher (Anderson and Krathwohl, 2001). The new model terms are (from lowest level to highest): remembering, understanding, applying, analyzing, evaluating and creating (Figure 1).

For the purposes of iFARM the pre-test administered was at the remembering level where students were asked to recall relevant knowledge from their long-term memory. The on-line iFARM module was at the understanding level where students constructed meaning from written terms and graphics. The next two levels, applying and analyzing, were addressed when students were asked to complete an activity worksheet where they used what they had learned to complete problems based on real-life scenarios. The evaluating level was accomplished when the students completed

Figure 1. Relationship between Bloom's Taxonomy (Anderson and Krathwohl, 2001) and iFARM Modules Format
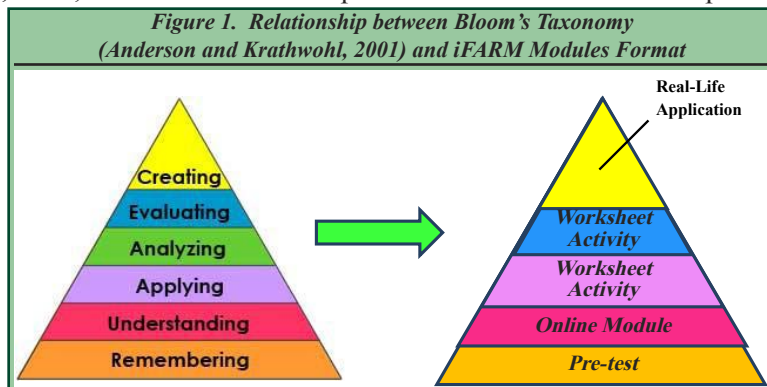
their post-tests. The last level of Bloom's Taxonomy, creating had not been entirely mastered by the students of the course. This level was partly addressed by the post-test where the students were asked to put fundamentals together to form a functional whole but the other aspect of this level was a real-life application where the students used what they have learned to answer and work through real-life scenarios centered on the topics taught in the modules. The students were continuing to master this aspect of the level in their everyday lives.

The theoretical framework for this study was based upon the concept of active learning where the core elements of active learning are student activity and engagement in the learning process. Active learning required students to do meaningful learning activities and think about what they were doing (Knobloch et al., 2007; Bonwell and Eison, 1991). In short, active learning refers to activities that are introduced into the classroom. Active learning is often compared to the traditional lecture where students passively receive information from the instructor (Prince, 2004). The growing influence of constructivism as a philosophical approach to learning, as well as research studies and papers investigating alternative models of teaching and learning, have prompted many teachers in universities to implement more authentic teaching and learning environments (Herrington and Herrington, 2006). The challenge teachers have faced is to align university teaching and learning with the way learning is achieved in real-life settings, to base instructional methods on more realistic approaches (Anderson et al., 1996; Collins et al., 1989; McLellan, 1996; Cobb and Bowers, 1999). According to a study by Armstrong (1983), students who receive a formal education learn better when they are actively engaged in the learning process as opposed to those who do not partake in the learning process.

Purpose and Research Questions

The purpose of this study was to describe students' perceptions of the learning experience using an educational agronomy curriculum developed for an introductory crop production course. Modules were developed that included lessons derived from material relevant to the goals of the course, instructional materials, worksheets, visual aids and activities that cover the subject material relating to agronomy. Research questions examined included:

1. (R1)What were students' perceived learning experiences using the iFARM modules?
2. (R2)Was there a difference in test scores between Fall and Spring semesters?

The pedagogical objectives of the iFARM modules were to focus on achieving a scientific principle and a critical thinking objective. The scientific principle encompassing demonstrations of scientific methods being utilized in order for students to identify problems, formulate hypothesis tests, conduct and analyze data and derive conclusions. The critical thinking objective was for students to be exposed to complex problems based on evidence-based information throughout each module. The learning objectives of the modules varied according to the subject content represented in the 13 modules. However, the overall objectives were designed to help students: develop an understanding of crop production, become aware of agronomic resources and to improve their ability to identify (ID) crop and weed plants.

Methodology/Procedures

Crop Production (AGRY 105) focuses on the fundamental principles of crop production. The class and lab combine ways to apply technological advances in agronomy to active crop-production situations including: basic soils, agricultural meteorology and crop physiology and breeding. The course was offered every semester and meets two days a week for a 50-minute lecture and a lab once-a-week. The study was conducted in the Fall and Spring semesters of 2008 to 2011.

Interactive Fundamental Agriculture Resource Modules (iFARM) were utilized during the course of the semester as a tool to help retain information learned in both class and lab. Students participated in a pretest, worksheet and a post-test to complete each iFARM assignment. They were allowed to use the computers within the Crops Resource Center (CRC) room, located on the main campus, or any computer where they had access to the campus's main server.

Background of Study

The development of iFARM consisted of the following project team developers: subject-matter experts, content writers, an instructional designer and multimedia developers. The modules were built using the Flash software to create animations. Visual designers utilized Adobe Illustrator to draw the iFARM characters and every complex visual element within the modules. Backgrounds, 3-state buttons and dynamic text were included directly in Adobe Flash. These animations allowed the students to experience activities through moving objects to simulate their ability to do the activities thus experiencing experiential learning. The researchers started with a general storyboard utilizing basic PowerPoint as the tool to

tell the story of the animation, mimicking as close of replication of the plants or situations as possible for the flash designers to understand the correct biological diagrams and processes. The PowerPoint included each step of what the students were expected to complete. After the first phase of storyboarding was completed with PowerPoint, it went into the Flash software. Once the Flash modules were finished, they were tested and deployed embedded in an HTML page that was displayed within the learning management system.

The iFARM modules were first implemented in an introductory freshman-level agronomy course starting in the Fall of 2008 using the Blackboard website. After completion of the first six modules in the Summer of 2008 (Phase I), the last seven modules were introduced in the Spring 2009 (Phase II), for a total of 13 modules created over 2008-2009 (Table 1). The modules were delivered to AGRY 105 in the following semesters: Spring 2009, Fall 2009, Spring 2010, Fall 2010, and Spring 2011. Thus, in total 226 students participated over the three years.

Table 1. List of Modules Developed During Phase I and Phase II

Phase I	Phase II
U.S Cropping Regions	Plant Breeding
Soil	Reproduction
Climate	Seed Quality
Germination-Early Growth	Integrated Pest Management
Roots (Biological Nitrogen Fixation)	Residue Management
Stems and Leaves	Seed Calibration
	Precision Farming

*Modules were used in the AGRY 105 course (Crop Production).
**Study conducted at Purdue University.
***Participants were from the semesters of Fall 2008 to Spring 2011.

Although the learning objectives were the same for both the Fall and Spring semesters, there were differences in the instruction of the course due to uncontrollable issues of the Midwest weather between the semesters. The Spring semesters had limited outdoor lab-based activities, while the Fall semesters had more opportunities to go outdoors to conduct additional lab instruction. As a result, the Fall instructor was able to do more hands-on outdoor activities where the participants were able to learn and practice the techniques being taught while also using the modules as a second teaching method. However, the Spring semester relied more on the modules with few hands-on outdoor activities. The weather barriers oftentimes lead to defining alternative ways of presenting the same content. While the objectives of this specific course were the same for both the Fall and Spring semesters, there were differences in the instruction of the course. Although students in the Fall semesters were offered the chance to go outdoors to participate in hands-on activities, the content of the labs was the same, the difference being that the

Fall semester students were able to use what they had learned in real-life scenarios.

Analysis of Data

Approval was obtained from the university's Institutional Review Board and no identifying information was used in data analysis. Data analyzed for each student included the completed set of both a pre-test and a post-test of knowledge comprehension, as well as the iFARM evaluation questionnaire. SPSS 19 was used to analyze data. If individual students were missing, the student was removed from the study. Correct responses to content items, as well as a few demographic questions, such as: age group, gender, college major and school year classifications were analyzed. For Table 3, the responses were a Likert-type scale ranging from strongly agree to strongly disagree. Data were coded to combine agreed responses together and disagreed responses together. After coding was complete, data were imported into SPSS where percentages were calculated by conducting frequency distributions for both the Fall semesters and the Spring semesters. The total average percent agreed number was calculated by adding all three Fall semester percentages and dividing by three and then repeating the process for the three Spring semesters. Frequency distributions were conducted for the pre-tests and post-tests for both the Fall semesters and the Spring semesters. In addition to frequency distributions, paired t-tests were conducted to calculate significant differences in overall scores in both the Fall and Spring semesters. Practical differences were determined using effect sizes (Cohen's d).

Moreover, qualitative responses were analyzed using an open-coding method, which included identification of unique themes. Conceptual labels were given to each data piece that personified the primary component of that piece. No identifying information was used in either the quantitative or qualitative data analysis.

Participants

The student population consisted of mostly under 20 (44%) and 20-25 (53%) year olds that were primarily freshman or sophomore males from the College of Agriculture from Fall 2008 to Spring 2011 (Table 2). Overall, 68% of the student population was male. Of these students most of them were enrolled in the course as a non-requirement for their majors.

Data Sources

The pre-tests and post-tests were developed by the instructor with questions based upon concept principles of the course. The data were collected using

Table 2. Frequency Distribution of the Demographic Variables of the Population for Fall and Spring Semester in Introductory Agronomy Class (AGRY 105)

Variable	*f*	Variable	*f*	Variable	*f*
Age		**Classification**		**College**	
under 20	99	Freshman	72	Agriculture	161
20-25	120	Sophomore	53	Liberal Arts	2
26-30	7	Junior	17	Science	2
		Senior	28	Undergraduate Studies	4
		Not Specified	2	Not Specified	4
Gender		**Major**			
Male	153	Required	20		
Female	71	Not Required	152		

*Study conducted at Purdue University.

**Participants were from the semesters of Fall 2008 to Spring 2011.

summative evaluation to look at the efficacy within each module and the final assessment evaluated the overall use of iFARM. A few qualitative responses were also used to help address common themes in participants' responses. On the post-test, students were asked to comment on their learning experiences using the module; however, not all students responded to this question and if a student did respond to the question on one or two modules they were not consistent in answering the question on all modules. The use of these methods was to provide a comprehensive collection of data that delivered saturation of responses on iFARM.

Summative Evaluation

The knowledge pre-tests were administered to the participants prior to each module while the knowledge post-tests were administered at the completion of the module and related activities using the Blackboard

Table 3. Evaluation of iFARM Questions and Percent Agreed for Fall and Spring Semesters in Introductory Agronomy Course (AGRY 105)

Question	Fall (n=147) Total Average Percent Agreed	Spring (n=79) Total Average Percent Agreed
The visual display of iFARM was easy to follow.	87.1	95.4
The delivery format of iFARM (interactive online module in Blackboard) was well chosen.	79.7	87.2
Important terms, concepts, and information were provided effectively.	77.1	84.7
The learning materials (worksheet, web-links, references, etc.) coordinated to form one cohesive program.	74.0	79.4
The use of iFARM stimulated my learning.	60.7	61.1
iFARM was useful for my learning.	64.5	71.5
Overall Mean (SD)	73.9 (9.8)	79.9 (12.2)

*iFARM (Interactive Fundamental Agricultural Resource Modules): a set of 13 agronomy related modules

**Study conducted at Purdue University.

***Participants were from the semesters of Fall 2008 to Spring 2011.

website. Both the pre-test and post-test were developed by the lead subject-matter expert to help participants learn what they were supposed to learn after using the instructional module. The final assessment of the overall use of iFARM was developed by the combined efforts of the lead module developer and an instructional design expert and administered as a hand-out at the end of the semester. The six Likert-type scale questions were written and organized in a way to provide information on the product's effectiveness (its ability to do what it was designed to do). The pre-tests, post-tests, and the final assessment were not pilot tested for reliability and validity prior to implementing them.

Results/Findings

iFARM Evaluation

R1: What were students' perceived learning experiences using the iFARM modules?

The first research question was to examine the students' perceived learning experiences of the iFARM modules. The students from all six semesters were asked the same six questions based on a Likert-type scale in regards to their overall experience with the iFARM modules. The six participating semesters were divided into their Fall and Spring semesters and depicts the percent of students that agreed with the six iFARM evaluation questions (Table 3). It is important to compare the percentages between Fall and Spring because the comparison is essential to know if there is a difference between how the Fall and Spring semesters viewed the modules due to the fact that the Spring semesters were relying more on the information coming from the modules than the Fall semesters (Table 3). Based upon the overall mean of the Spring semesters 79.9% agreed with the six items asked in the evaluation while 73.9% agreed in the Fall semesters. The students in the Spring semesters had more positive perceptions of their learning experiences with the modules (d= 0.54, medium effect size). According to the total average percent of students who agreed with the six questions: 95.4% thought that the visual display of iFARM was easy to follow in the Spring semesters while 87.1% agreed in the Fall semesters. During the Spring semesters 87.2% of students thought that the delivery format for iFARM was well chosen while 79.7% of the Fall semester agreed; 84.7% of Spring semester students thought that important terms, concepts and information were provided effectively; while 74.0% of Fall semester students thought that the learning materials coordinated

Table 4. Themes Regarding Students' Perceived Usefulness of iFARM Modules in Introductory Agronomy Course (AGRY 105)

Theme	Frequency (N = 226)	Example Quotations
Yes	34% (n = 77)	"I found it very useful and enjoyed it." "Yes, learned a lot." "Yes, I was an effective learning tool." "Yes I found it very useful and thought it was a great way to catch on to the information." "It was very fun and virtually interactive."
Yes, helped me learn new material.	45% (n = 101)	"Yes, it allowed me to see how the information we are learning in class can actually be put to practical use." "I learned much from iFARM activities and also I understood some modern methods which I haven't seen before." "Yes, it helped in understanding weather better." "Yes it taught me a lot I didn't already know."
No	18% (n = 41)	"Not really, it was a waste of time." "Not really because I know most of it already." "No, it had too many technical difficulties." "No, it is too difficult to use."
It was too simplistic for our age.	3% (n = 7)	"Some of the tasks were almost childish. Make them a challenge. Don't leave some of the questions for unlimited answers." "iFARM still seemed like a middle school activity."

*iFARM (Interactive Fundamental Agricultural Resource Modules): a set of 13 agronomy related modules
**Study conducted at Purdue University.
***Participants were from the semesters of Fall 2008 to Spring 2011.

to form one cohesive program; and 61.1% of Spring semester students thought that iFARM stimulated their learning. While 64.5% of Fall semester students thought that iFARM was useful to their learning.

All 226 students were given an opportunity to comment on their experience with individual iFARM modules in a qualitative format on the post-test. Themes discovered while analyzing student responses on whether or not the modules were useful. Table 4 illustrates the themes as well as example quotations of perceived module usefulness from the students. Of the 226 students 79% responded that they found the modules useful to their learning; while 21% thought that the modules did not contribute to their learning in the course with 3% of those students indicated that the modules were childish or too simplistic.

Knowledge Pre-test and Post-test Evaluation

R2: Was there a difference in test scores between Fall and Spring semesters?

The second research question was to examine the difference in test scores between the Fall and Spring semesters. Table 5 depicts the overall averages for the knowledge pre-tests and the post-tests divided into Fall and Spring semesters. Students who completed the modules during the Fall semester performed 73% as a grand average on the knowledge post-tests.

Students who completed modules during the Spring semester performed 68% as a grand average on the knowledge post-tests. Both, the Fall and Spring semester cohorts of students, had significantly higher post-test scores in comparison to pre-test scores, which leads us to believe that the modules were effective in teaching the participants some new material. In comparison between the two semesters, the Spring semesters' increase was less than the Fall semesters' increase.

Conclusion/Implications/ Recommendations

College students reported the computer-based modules were beneficial to learning agronomy knowledge in an introductory course. Also, college students scored higher on knowledge tests upon completion of the modules for both, field-based labs and computer-based labs. However, students in the field-based lab section had higher knowledge than their peers in the computer-based lab only section. Results of this study are comparable to the findings of Marrison and Frick (1993), who found that the comparative effectiveness of computer multi-media to traditional lecture instruction as student achievement was essentially equal when taught using the computer multi-media form of instruction as compared to the field-based labs. Students shared they would like to learn using both computer multi-media and traditional lecture situations. Multi-media computer modules provide another venue for agricultural education teachers to supplement or replace a portion of traditional classroom instruction, thus allowing the teacher more time to attend to individual needs of students (Torres and Cano, 1994). The discipline of agricultural education lends itself well to the use of computer multi-media

Table 5. Overall Average of Pre-tests and Post-tests for the Fall and Spring Semesters for an Introductory Agronomy Course (AGRY 105)

	Pre-test Overall Average (SD)	Post-test Overall Average (SD)	Cohen's d
Fall (n=93)	61% (7.74)	73% (7.65)	1.59 Large
Spring (n=80)	60% (12.69)	68% (7.81)	0.76 Medium

*Study conducted at Purdue University.
**Participants were from the semesters of Fall 2008 to Spring 2011.

because of the variety of courses and topics presented within the curriculum. The results of the study imply that the use of the iFARM modules as an additional form of teaching with lectures is a positive advantage for any agronomy course not just the introductory agronomy course discussed in this article.

This study further confirms previous research illustrating computer modules as novel strategies for the distribution of different concepts to a general audience (Smetana and Bell, 2011). Our findings also help to support the increasing use of computer-based instruction in classrooms. The use of the iFARM modules, which could be modified to allow use in numerous other classrooms and grade levels, could increase motivation and student involvement. There is a constant need for agricultural curricula that targets all grade levels and when used properly modules like iFARM can provide instructional tools necessary to achieve the objectives of college and university courses as well as other grade levels (Smetana and Bell, 2011). Instructional advantages in using modules in a college classroom permit the student to experience life-like situations in a realistic environment, conducive to active involvement. Because today's society is such an information based society the requirement of computer knowledge is both imperative for success in our personal and professional lives.

This study evaluated a small number of students, at a large Midwestern university, in an introductory agronomy course and cannot be applied to any other group of students using the same or an alternative form of web-based instruction. Our study can be used to look at how one class effectively incorporated computer-based instruction to enhance in-class activities to improve student learning and understanding of the course material. The goal of the modules is to increase knowledge on agronomy topics and it is known that long-term knowledge gains have more of an impact than short-term gains in knowledge. A limitation of this study is that it was not a quasi-experimental design that looked specifically at how the modules impacted learning. The difference in knowledge was for the entire course, which could have been contributed due to other factors and not just the difference in how the students experienced the labs. It could be beneficial to do a follow-up knowledge evaluation of the students towards the end of the semester instead of immediately following the end of the module and activity worksheet for retention purposes. Another limitation of the study was the weather during the Spring semesters limiting outdoor lab-based activities. It could have been beneficial to have similar weather both semesters in order to examine whether or not the result would have been consistent from one semester to the next. Also, conducting reliability and validity tests for the pre-tests, post-tests and final assessment would have been valuable to the study.

For future iFARM analysis pre- and post-test questions should be analyzed for significant knowledge gain and loss per individual module in order to help determine what modules are more helpful for students. Future analysis should also be conducted to analyze what specific improvements should be made to individual modules. Also, it is recommended that more in-depth questions be asked of the students in regards to their opinions about the iFARM modules, context specific, on an individual module basis. Future studies comparing student attitudes among different components of the modules to better generalize student attitudes toward on-line modules are suggested. Finally, it is recommended that additional questions be asked in the questionnaire to better understand students' motivation and what components of the modules' were most beneficial for student learning. Student learning preferences should also be taken into consideration in a future study to help understand what types of learners will benefit more from the use of the iFARM modules.

Literature Cited

Anderson, J.R., L.M. Reder and H.A. Simon. 1996. Situated learning and education. Educational Researcher 25(4):5-11.

Anderson, L.W. and D.R. Krathwohl. 2001. A taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy of educational objectives: Complete edition, New York: Longman.

Armstrong, J.S. 1983. Learner responsibility in management education, or ventures into forbidden research. Interfaces 13:26-38.

Bonwell, C. and J. Eison. 1991. Active learning: Creating excitement in the classroom (Higher Education Report No.1.) Washington, DC: ASHE-ERIC.

Born, K.A. and G. Miller. 1999. Faculty Perceptions of web-based distance education in agriculture. Jour. of Agricultural Education 40(3):30-39.

Cano, J. and C. Martinez. 1991. The relationship between cognitive performance and critical thinking abilities among selected agricultural education students. Jour. of Agricultural Education 32(1): 24-29.

Chance, P. 1981. The remedial thinker. Psychology Today 5: 63-73.

Cobb, P. and J.S. Bowers. 1999. Cognitive and situated learning perspectives in theory and practice. Educational Researcher 28(2):4-15.

Collins, A., J. S. Brown and S.E. Krathwohl. 1989. Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics. In L.B. Resnick (Ed.), Knowing, learning, and instruction: Essays in honor of Robert Glaser. Hillsdale, NJ: Erlbaum.

Diebel, P.L., M.L. McInnis and W.D. McInnis. 1998. Student use and perceptions of distance education technologies. NACTA Jour. 42(1):24-31.

Fuerestein, R.N. 1980. Instrumental enrichment: An intervention program for cognition modifiability. Baltimore: University Park Press.

Herrington, A. and J. Herrington 2006. What is an authentic learning environment? In A. Herrington and J. Herrington (Eds.), Authentic learning environments in higher education (pp. 1–13). Hershey, PA: Information Science Publishing.

Herrington, J., R. Oliver and T.C. Reeves. 2003. Patterns of engagement in authentic online learning environments. Australian Jour. of Educational Technology 19(1):59-71.

James, R., C. Lamb, M. Baily and D. Householder. 2000. Integrating science, mathematics and technology in middle school technology-rich environments: A study of implementation and change. School Science and Mathematics 100: 27–40.

Lombardi, M.M. 2007. Authentic learning for the 21st century: an overview. Educause Learning Initiative, ELI Paper. Available at: http://net. educause.edu/ir/library/pdf/ ELI3009.pdf.

Knobloch, N., S. Siegel and A. Ball. 2007. Best practices for active learning in the agricultural, Environmental and Life Sciences. [On-line]. www. ydae.purdue.edu/lct/NALCT/active_learning_ best_practice_color.pdf

Marrison, D.L. and M.J. Frick. 1993. Computer multimedia instruction versus traditional instruction in post-secondary agricultural education. Jour. of Agricultural Education, 31-38.

McLellan, H. 1996. Situated learning perspectives. Englewood Cliffs, NJ: Educational Technology Publications.

Means, B. and K. Olson. 1994. The link between technology and authentic learning. Educational Leadership 51(7):15-18.

Milheim, W. 1995–96. Interactivity and computer-based instruction. Jour. of Education Technology Systems 24(3):225–233.

Miller, G. 1997. Cognitive style preferences of agricultural distant learners. NACTA Journal 41(4):23-28.

Miller, G. and N.L. Powell. 1998. Teaching strategies for agricultural distance educators. NACTA Jour. 42(4):52-55.

O'Kane, M. and J.D. Armstrong. 1997. Developing course materials using the World Wide Web. NACTA Jour. 41(2): 10-12.

Oliver, R., A. Omari and J. Herrington. 1998. Investigating implementation strategies for WWW-based learning environments. International Jour. of Instructional Media 25(2):121-138.

Pierrakos, O., A. Zilberberg and R. Anderson. 2010. Understanding undergraduate research experiences through the lens of problem-based learning: implications for curriculum translation. The Interdisciplinary Jour. of Problem-based Learning 4(2):35-62.

Prince, M. 2004. Does active learning work? A review of the research. Journal of Engineering Education 1-9.

Rudd, R., M. Baker and T. Hoover. 2000. Undergraduate student learning styles and critical thinking abilities: Is there a relationship? Jour. of Agricultural Education 41(3):2-12.

Rushton, J.P. and A.R. Jensen. 2005. Thirty years of research on race differences in cognitive ability. Psychology, Public Policy, and Law 11:235−294.

Seiler, J. R., J.A. Peterson, C.D. Taylor and P.P. Feret. 1997. A computer-based multimedia instruction program for woody plant identification. Jour. of National Resources and Life Sciences Education 26 (1):129-13-1.

Smetana, L.K. and R.L. Bell. 2011. Computer simulations to support science instruction and learning: A critical review of the literature. International Jour. of Science Education, DOI:10. 1080/09500693.2011.605182

Torres, R.M. and J. Cano. 1994. Learning styles of students in a college of agriculture. Jour. of Agricultural Education 35(4): 61-66.

Unruh Snyder, L., J. P. W. On and S. Ambrose. 2009. Design and development of interactive fundamental agricultural resources materials (iFARM). American Education Research Association Conference, San Diego, CA; April 13-17.

Whittington, K.J. 2004. Infusing active learning into introductory programming courses. Jour. of Computing Sciences in Colleges 19(5):249-259.

Liberty Hyde Bailey:
Agricultural Educator and Philosopher

James J. Connors[1]
University of Idaho
Moscow, ID

Abstract

Liberty Hyde Bailey was a pioneer in American agriculture. Bailey studied agriculture at Michigan Agricultural College. He returned to MAC as chair of the new department of horticulture. He moved to Cornell University where he advanced to become Dean of the College of Agriculture. Bailey was instrumental in the development of horticultural science in America, and is considered the "Father of American Horticulture." He was a prolific writer of books related to horticulture, agriculture, nature and environmental philosophy. Bailey pioneered the use of nature study in schools to encourage youth to investigate nature and their environment. As rural life was facing severe challenges at the turn of the 20th century, President Roosevelt called on Bailey to chair his Country Life Commission. The commission made numerous recommendations on ways to improve rural life, agricultural production and standards of living in the early 1900s America. Liberty Hyde Bailey was a monumental figure in the development of modern horticulture, agricultural education, nature study and rural life in America. His writings should be required reading for anyone interested in improving their knowledge of horticulture, sustainable agriculture and environmental philosophy.

Introduction

The profession of agricultural education has many pioneers. Ask anyone involved with agricultural education who Justin Morrill was and they will reply that he wrote the Land-Grant College Act. Most will know that Seaman Knapp developed the demonstration farm and championed extension education. Anyone who has ever been involved with 4-H will know that A.B. Graham is considered the Father of 4-H clubs. FFA members will be able to tell you that Hoke Smith and Dudley Hughes wrote the Smith-Hughes Vocational Education Act. They will be able to tell you that Henry Groseclose was one of the founders of the

Future Farmers of Virginia and eventually the Future Farmers of America.

But ask most people who Liberty Hyde Bailey is and you will probably receive a blank stare. While Liberty Hyde Bailey is well known by anyone who studies horticulture in America, he is relatively unknown by agricultural education professionals. This is an unfortunate oversight for Liberty Hyde Bailey played an important role in establishing nature-study and agricultural subjects in both elementary and secondary schools in the late 1800s and early 1900s. He was the chair of President Theodore Roosevelt's Commission on Country Life in 1908. He wrote numerous books on production agriculture, horticulture, nature-study, the teaching of agricultural subjects and the country life movement in the United States.

Bailey was truly an unsung pioneer for agricultural education at the elementary, secondary and post-secondary levels of education in America. His nature-study ideas, his thoughts on agricultural education, his environmental, ethical and moral theories and his

[1]Associate Professor and Department Head

love of the country life and the open country should be studied and valued by every agricultural education professional. Bailey's writings from 1885 until his death in 1954 are as important and valuable today as they were over 125 years ago.

Review of Literature

Many individuals played an important role in the history of agricultural education in the United States. In their study on the great individuals and events in the history of agricultural education in America, Camp and Crunkilton (1985) identified 10 individuals who most influenced the history of agricultural education. Included in their list was Henry Groseclose, who along with Harry Sanders, Walter Newman, and Edwin MaGill founded the Future Farmers of Virginia in 1925. This eventually led to the establishment of the Future Farmers of America in 1928.

Moore (1988) called Rufus W. Stimson "the forgotten leader in agricultural education" (p. 50). Moore wrote that, *"In the formative years of vocational agriculture, many people were opposed to this 'new' type of education. A number of people did not view agriculture as being worthy of study"* (p. 55). Moore added that, *"Having a person of Stimson's background and training arguing for a balanced education, one which included vocational education, did much to advance vocational education"* (p. 55).

Camp (1987) discussed the roles that Hoke Smith, Dudley Hughes, Charles Prosser and Carrol Page played in getting federal legislation to support vocational education passed through the U.S. Congress. Camp wrote that, *"There were many education, industrial, political, and other leaders advocating federal vocational legislation during the first 17 years of the 20th century...Four of the champions of such legislation were Hoke Smith, Charles Prosser, Dudley Hughes, and Carroll Page"* (p. 7).

In another article by Moore (1987), he discussed Liberty Hyde Bailey's nature study idea when he wrote, *"The forerunner of agricultural education was nature study and school gardens, primarily in elementary schools"* (p. 9). Moore specifically recognized Bailey when he stated, *"A leader in the nature study movement was Liberty Hyde Bailey of Cornell, who in 1896, prepared a bulletin titled How a Squash Plant Gets Out of the Soil"* (p. 9).

A.B. Graham was another individual who played a major part in promoting agricultural education, country life and youth leadership development. He is credited with being one of the individuals who developed the agricultural club movement for rural boys and girls which eventually lead to the 4-H clubs

in most counties. McCormick and McCormick (1984) wrote that, *"Like many educational leaders of the 1890s and early 1900s Graham attempted to increase the teacher's role in decision making, but he tried to do this while enhancing parent and student participation until schools became community centers"* (p. 171).

Many individuals played important roles in agricultural education around the turn of the 20th century. However, no one brought as broad of experience to the issue as Liberty Hyde Bailey. Bailey was a farm boy, naturalist, educator, agricultural dean and champion of the country life movement. This research study will identify the contributions Bailey made to agriculture, horticulture, agricultural education and the country life for all citizens of the United States.

Purpose and Objectives

The purpose of this historical research study is to investigate the influence Liberty Hyde Bailey had on the field of agricultural education. Objectives which guided the study included:

1. Describe Bailey's history in horticulture and higher education in agriculture.
2. Describe Bailey's emphasis on nature-study for elementary school students.
3. Describe Bailey's leadership as Chairman of the Commission on Country Life.
4. Describe Bailey's work in agricultural and extension education.

Results and Discussion

Early Background

Liberty Hyde Bailey was born into a farm family in South Haven, Michigan on March 15, 1858. Bailey's father had moved to Michigan from Vermont in 1841 looking for a frontier filled with forests, prairies and fertile farm land (Dorf, 1956). When Liberty was only a boy of five years of age, his mother Sarah died of diphtheria. This tragic event played an important part in his formative years.

Dorf (1956) writing a biography of Bailey wrote, *"Since young Liberty was too old to be confined to the house and yard and too young for anything more than a few light chores, the family left him largely to his own devices. He wandered through orchard, darted in and out of the new barn, which the men were sheathing with hemlock boards, and watched the tadpoles in the little swamp. Back of the barn was a field that his father early had cut from the forest for use as a pasture. It contained hummocks, each about three to four feet high, each an observation point from which a young explorer could view the changing landscape"* (p. 6-7).

Liberty Hyde Bailey

Bailey grew up being influenced by the nature around his South Haven farm. He also loved to read anything he could get his hands on. Two of his favorite books were Charles Darwin's On the Origin of Species and Asa Gray's Field, Forest, and Garden Botany (Liberty Hyde Bailey Museum, n.d.). Bailey's observations of nature and his prolific reading habit led to a love of birds. When he was just 15 years old he wrote his first manuscript titled "Birds" which he presented before the Michigan Pomological Society and published in the Annual Report of the Society in 1873. As a result of his presentation, he was elected to serve as the ornithologist and entomologist for the South Haven Pomological Society.

In 1877 Bailey enrolled in Michigan State Agricultural College (MAC). At MAC, he became the protégé of Dr. William Beal, professor of botany and horticulture. Bailey graduated with a Bachelor's of Science degree in August 1882. After a stint as a reporter for an Illinois newspaper, he accepted a position as an assistant to Asa Gray at Harvard University. After working at Harvard, he was asked to chair the new department of horticulture and landscape gardening at his alma mater, Michigan State Agricultural College. Bailey began teaching at MAC in 1885. He would only stay at the college for three years for in 1888 he was enticed to become the Chair of practical and experimental horticulture at Cornell University in New York. Bailey established himself as a dedicated teacher, researcher and author at Cornell. In 1903, as a result of his quality teaching and leadership, he was named Dean of the College of Agriculture, a position in which he would remain until 1913.

Father of American Horticulture

Bailey arrived on the American agriculture scene at a unique time in history. Agriculture was expanding rapidly after the Civil War with new innovations, production practices and management techniques. Bailey was the first to view the use of fruits, vegetables and ornamental and nursery plants as important contributions to agriculture. He also viewed horticulture as a science and not just gardening, as many of the botanists of the day did.

Throughout his academic career, Bailey knew the importance of research and writing. He wrote his first book titled Talks Afield: About Plants and the Science of Plants in 1885 while teaching at Michigan Agricultural College. This was followed in 1886 by Field Notes on Apple Culture and many more in the years to come. A sample of his early works in the horticulture field include: The Horticulturalist's Rule Book, Annals of Horticulture, The Nursery Book, Principles of Fruit Growing, Principles of Vegetable Gardening, The Pruning Book, Garden Making, Principles of Agriculture and Lessons with Plants, a book to show how teachers can teach using plants in their classrooms.

Dorf (1956) reported that *"From 1889 to 1896 more than half the bulletins published by the Cornell University Experiment Station were written by Bailey"* (p. 74). In 1903, Bailey published his first major work, the Cyclopedia of American Horticulture, a 4 volume work that he edited.

Bailey's university courses, his lectures and presentations to agricultural groups around the country, his horticultural research and his tireless publishing on agricultural and horticultural topics earned him the title of Father of American Horticulture. In a biography published in 1994, Banks described Bailey's importance to the history of horticulture when he wrote, On November 5, 1990, the American Society for Horticultural Science initiated a Hall of Fame designed to "honor distinguished persons who have made monumental and unique contributions to horticulture." Only two scientists were inducted at the initiation—Gregor Mendel, the Austrian monk who solved the riddle of heredity, and Liberty Hyde Bailey (p. 3)

Prolific Writer

Liberty Hyde Bailey began prolific writing as a youth. He continued to write as a college student at Michigan Agricultural College, as a newspaper reporter in Illinois and finally as a college professor and dean at Cornell University. In the beginning his writing focused on his love of nature, agriculture and horticulture. As was described above, he wrote numerous books on various subjects related to plants, gardening, horticulture, agriculture and education. Bailey's writings were organized into several series of books. These series included:

Rural Life Series
Garden Craft Series
Open Country Series
Rural Science Series
Rural Text-Book Series

Table 1 includes examples of the series books that were written by Liberty Hyde Bailey.

Bailey also published what he called the Background Books. These books went beyond Bailey's horticultural topics and introduced the world to his environmental philosophy, society, politics and ethics. The Background Books included:

The Holy Earth (1915)
Wind and Weather (1916)

Universal Service (1918)
What is Democracy (1918)
The Seven Stars (1923)

Bailey's environmental philosophy has proven so relevant to today's society that it was recently republished. Bailey (2008) describes his view of the holy earth when he wrote, *"One does not act rightly toward one's fellows if one does not know how to act rightly toward the earth"* (p. 2). Bailey goes on to describe his love of the earth by stating, *"Every man in his heart knows that there is goodness and wholeness in the rain, in the wind, the soil, the sea, the glory of sunrise, in the trees, and in the sustenance that we derive from the planet"* (p. 7). Describing the importance of agriculture, Bailey wrote that *"A good part of agriculture is to learn how to adapt one's work to nature, to fit the crop-scheme to the climate and to the soil and the facilities. To live in right relation with his natural conditions is one of the first lessons that a wise farmer or any other wise man learns"* (p. 9).

Table 1. Liberty Hyde Bailey Book Series Examples	
Rural Life Series	
The Nature-Study Idea (1903)	
The State and the Farmer (1908)	
The Outlook to Nature (1905)	
The Country-Life Movement(1911)	
Rural Science Series (Bailey, 1909)	
Bacteria in Relation to Country Life	The Care of Animals
Bush-Fruits	The Farmer's Business Handbook
Farm Poultry	The Farmstead
Feeding of Animals	The Fertility of the Land
Fertilizers	The Forcing Book
Forage Crops	The Horse
Garden Making	The Nursery Book
How to Choose a Farm	The Practical Garden Book
Irrigation and Drainage	The Principles of Fruit Growing
Mile and Its Products	The Principles of Agriculture
Plant Breeding	The Pruning Book
Principles of Vegetable-Gardening	The Soil
Rural Wealth and Welfare	The Spraying of Plants

The Liberty Hyde Bailey Museum (n.d.) recognizes the author when they wrote: Liberty Hyde Bailey was a prodigious 20th century author, whose writing spanned eighty-one years. Bailey's name appears over 700 titles ranging from botany, horticultural, encyclopedias, poems, conservation, agriculture, democracy, education and spirituality all of which still inform us today. More than any other person Bailey was responsible for a new American literature of horticulture. It is clear from the volume of informational bulletins, books, poems, philosophical and environmental articles that Bailey wrote, that he was one of the most influential agricultural educators of the 19th and 20th centuries.

The Nature Study Movement

Bailey grew up wandering around his father's Michigan farm spending countless hours observing nature. He learned to love plants, animals, trees and bugs. As a result he became an ornithologist whose first paper was titled Birds (Dorf, 1956). As a result of his upbringing, one of Bailey's first major undertakings was to promote nature study for elementary students in the United States. Bailey had already established himself as an agricultural and horticultural expert throughout New York. His idea of promoting nature study among elementary teachers and students would make Bailey a household name. Dorf (1956) wrote, *"The leadership which Bailey provided in the development of the nature-study movement was to make his name as well known among elementary school teachers as among professors of agriculture"* (p. 109). Bailey worked with colleagues in the College of Agriculture at Cornell University to develop a series of leaflets for elementary teachers that explained the nature-study movement and provided ideas for teachers to use in nature study activities. The L.H. Bailey museum (Using Bailey in the Classroom: Nature Study, n.d.) describes how Bailey developed the nature-study idea:

Growing-up on a Michigan farm during the end of the 19th century, Liberty Hyde Bailey had a first-hand experience of nature's ability to teach scientific observation and instill a personal appreciation and an ethic of care for the landscape. Rooted in this background, Bailey along with associates at Cornell University became key figures in the founding of the Nature-Study Movement. Its aim brought children out of the classroom and into the outdoors for mini nature lessons through informal observation. Still in use today, it professes no standardization or science but only for the student to "establish a living sympathy with everything that is." In the first leaflet Bailey (1897) describes nature-study as: *"a process, is seeing the things that one looks at, and the drawing of proper conclusions from what one sees. Its purpose is to educate the child in terms of his environment, to the end that his life may be fuller and richer."* (p. 11)

Bailey went on to provide more details about the nature-study idea. He wrote that, *"It is informal...It trains the eye and the mind to see and to comprehend the common things of life..."* (Bailey, 1897, p. 11). He also provided some idea of what could be considered nature-study when he stated, *"The proper objects of nature-study are the things that one oftenest meets. Stones, flowers, twigs, birds, insects, are good and common subjects...Plants are more easily had... although animals and minerals should by no means*

be excluded" (p. 11).He also shared the reason for proposing the introduction of nature-study into the elementary curriculum. Bailey said that, *"One difficulty with our present school methods is the necessary formality of the courses and the hours...The best way to teach nature-study is, with no hard and fast course laid out, to bring in some object that may be at hand and to set the pupils to looking at it."* (p. 12)

The interest in Bailey's nature-study idea continued to grow throughout the late 1890s and into the new century. Bailey continued to emphasize that nature-study should be included in all elementary schools. Every school should have a nature-study area and a garden where pupils could engage in nature-study. Writing in his book The Outlook to Nature (Bailey, 1915), he stated that, "I should put one acre of land as the lowest limit for a country school" (p. 127). His emphasis on using school gardens is evident in his stating, *"The school-garden will do much to place the school in proper relation to its natural problems and will be an intermediate stage between the schoolhouse and the larger environment of the neighborhood"* (p. 128).

Elementary school teachers were eagerly adopting the nature-study idea for introducing the natural world to their students. In 1903, Bailey finally compiled a comprehensive book to explain the nature-study movement and assist interested teachers in incorporating it into their schools. Bailey also introduced the idea of teaching nature-study though agriculture. Bailey wrote, *"Children in the home and school should be interested in horticulture and agriculture as a means of introduction to nature. Farming introduces the human element into nature and thereby makes it more vivid in the child's mind"* (Bailey, 1911a, p. 90). Bailey went on to describe the importance of using agriculture for nature-study when he stated, *"All good agriculture work in the grades* [elementary grades] *must be nature-study. All agricultural subjects must be taught by the nature-study method, which is: to see accurately; to reason correctly from what is seen; to establish a bond of sympathy with the object or phenomenon that is studied."* (p. 100).

The nature-study movement was a definite success for Bailey and the College of Agriculture at Cornell University. Dorf (1956) reports that, *"By 1903 nearly three thousand grade-school teachers were receiving nature-study guidance by correspondence; nearly thirty thousand children were raising plants in school gardens"* (p. 112). Bailey described the importance of the nature-study movement (Dorf, 1956) for the College of Agriculture when he wrote, *"It is trying to help the farmer and it begins with the most teachable point -*

the child. The district school cannot teach agriculture any more than it can teach law or engineering or any other profession or trade, but it can interest the child in nature and in rural problems and thereby fasten its sympathies to the country. The child will teach the parent." (p. 113)

The nature-study movement made Bailey a promoter of the environment, nature and agricultural education, not only in colleges and universities, but for younger students as well. It would also introduce Bailey as a leader who was dedicated to the education and quality of life of all country folk.

Country Life Commission

Having worked in agricultural education since 1885, Bailey was well known throughout the country. In 1908, Bailey's work in education and agriculture would come to the attention of President Theodore Roosevelt. Agriculture and rural communities were suffering. Large numbers of workers were leaving farming for factory work in the cities. There was a growing concern that if the decline in rural towns continued it would result in the disaster for farming and agricultural production. To counteract this problem, President Roosevelt created the Commission on Country Life. In a letter to Bailey, Roosevelt (Commission on Country Life, 1911) wrote, *"No nation has ever achieved permanent greatness unless this greatness was based on the well-being of the great farmer class, the men who live on the soil; for it is upon their welfare, material and moral, that the welfare of the rest of the nation ultimately rests. How can life on the farm be kept on the highest level and where it is not already on that level, be so improved, dignified and brightened as to awaken and keep alive the pride and loyalty of the farmer's boys and girls...How can a compelling desire to live on the farm be aroused in the children that are born on the farm?"* (p. 41-44)

Other noted professionals invited to serve on the Commission on Country Life included Henry Wallace of Iowa, President Kenyon Butterfield of the Massachusetts Agricultural College and Gifford Pinchot, head of the U.S. Forest Service. Bailey was asked to chair the commission. Bailey and the other members of the commission proceeded to hold hearings around the country to listen to the problems and concerns of country citizens. They also mailed out questionnaires to rural residents to collect their opinions on a number of issues. One question in particular asked, *"Are the schools in your neighborhood training boys and girls satisfactorily for life on the farm?"* (Commission on Country Life, 1911, p. 51). Reportedly, *"About 550,000 copies of*

the circular questions were sent to names supplied by the United States Department of Agriculture, state experiment stations, farmers' societies, women's clubs, to rural free deliverymen, country physicians and ministers and others. To these inquiries about 115,000 persons have now replied...” (p. 54). In its final report, the Commission (Commission on Country Life, 1911) expressed their feelings that there was a *“need for a redirection in rural education. The subject of paramount importance in our correspondence and in the hearings is education...Everywhere there is a demand that education have relation to living, that the schools should express the daily life and that in the rural districts they should educate by means of agriculture and country life subjects. It is recognized that all difficulties resolve themselves in the end into a question of education. The schools are held to be largely responsible for ineffective farming, lack of ideals and the drift to town.”* (p. 121).

In relation to the growing trend of teaching agriculture in schools the Commission wrote, *“The feeling that agriculture must color the work of rural public schools is beginning to express itself in the interest in nature-study, in the introduction of classes in agriculture in high schools and elsewhere and in the establishment of separate or special schools to teach farm and home subjects.”* (p. 123)

The report also delved into the need for federal government support of new educational initiatives when it stated, *“It will be increasingly necessary for the national and state governments to cooperate to bring about the results that are needed in agricultural and other industrial education”* (p. 125). The commission also noted the growing interest in extension education across the country. It was written in the report that, *“This extension work includes such efforts as... demonstration on farms, nature-study and other work in schools, boys' and girls' clubs of many kinds...”* (p. 126). As a result of their surveys and hearings, the commission officially recommended that *“To accomplish these ends, we suggest the establishment of a nation-wide extension work”* (p. 127). In the concluding statement of the Commission's report, Bailey wrote, *“The great need everywhere is new and young leadership, and the Commission desires to make an appeal to all young men and women who love the open country to consider this field when determining their careers. We need young people of quality, energy, capacity, aspiration and conviction, who will live in the open country as permanent residents on farms, or as teachers, or in other useful fields and who... will still have unselfish interest in the welfare of their communities.”* (149-150)

Agricultural and Extension Education

Throughout his academic career and service on the Commission on Country Life, Liberty Hyde Bailey always promoted the idea of nature-study and agricultural education to improve country life. Writing in his own book titled "The Country-Life Movement in the United States," Bailey (1911b) wrote, *“Agriculture is now a school subject. It is recognized to be such by state syllabi, in the minds of the people and in the minds of most school men. It is finding its way into high schools and other schools here and there...It is now our part to define the subject, organize it and actually to place it in the schools. We must understand that the introduction of agriculture into the schools is not a concession to farming or to farmers. It is a school subject by right.”* (p. 62-63).

Bailey believed that no one needed to apologize for including agricultural education into the American school system. He thought it was a good idea to extend the agricultural education that was being taught in colleges of agriculture to all citizens of rural America. Bailey (1911b) wrote, *“We are now attempting to extend this democratic education by means of agriculture to all ages of our people, and there is promise that we shall go farther in this process than any people has yet gone...and with a voice in the affairs of government, should give to the people of the United States the best country life that has yet been produced.”* (p. 65)

Writing in 1911, six years before the passage of the Smith-Hughes Vocational Education Act, Bailey stated, *“Agriculture work is proceeding in nearly all the states under the auspices of the United States Department of Agriculture...and there is agitation for the passage of a national bill to further secondary and special agriculture-education in the states”* (p. 70). Bailey even expressed his concerns about the preparation of future agriculture teachers. Writing in his book The State and the Farmer, Bailey (1908) wrote, *“...regular administrative departments of public instruction should handle the work of all fundamental elementary and secondary education. They will need to call on the agricultural colleges for help, especially in the training of teachers...”* (p. 107). Bailey was always concerned with the public's perceptions of farm life. As a Dean of the College of Agriculture at Cornell University he surveyed students about their perceptions of farm life. In his book The Training of Farmers (Bailey, 1910) described the problem by writing, *“...farm life is not made attractive for the boys. Many of them have very little education, and their life is to them merely hard drudgery from early morning to late at night, with only a bare living as a return...With the increase of agricultural education and betterment of conditions*

in the country, I believe this will change. The young men will come to see the brighter side of farm life, and the attractions and advantages in staying on the farm." (p. 98)

Bailey also shared that he thought that agriculture should be incorporated into all education not just taught as a stand-alone vocational subject. Bailey indicated that, *"When these…activities are agricultural (as they are in a rural community), then agriculture becomes a means of education, but it is not agriculture in the sense of a specialty leading directly to the occupation of farming. That is to say, in such cases agriculture (which is the sum of the community life) becomes the real backbone and motive of the school. Other subjects grow out of it…"* (p. 151)

Conclusion

Liberty Hyde Bailey was truly a pioneer of agricultural education in America. From 1885 when he enrolled in Michigan Agricultural College to his retirement as Dean of the College of Agriculture at Cornell University, he spent his entire life working in horticulture, agricultural production, agricultural and extension education, nature-study and the country life movement (Peters, 2006). His development and promotion of nature-study leaflets and books for elementary teachers and students was the forerunner of agricultural education in elementary and secondary schools. It introduced thousands of students to the importance of nature and led many to study nature, the environment and agricultural education in secondary schools.

In the past decade society has witnessed a growth of a renewed movement back to nature. There has been increased emphasis on getting both children and adults away from technology and indoor entertainment and rediscover the health effects of nature. The concept of nature deficit disorder was introduced by Louv (2006) in his book Last Child in the Woods. Louv defined nature deficit disorder as *"the human costs of alienation from nature, among them; diminished use of the senses, attention difficulties and higher rates of physical and emotional illnesses. The disorder can be detected in individuals, families and communities"* (p. 34). Louv went beyond Bailey's emphasis on using nature for educational purposes, to using nature to improve human health. He states, *"…a growing body of evidence indicates that direct exposure to nature is essential for physical and emotional health. For example, new studies suggest that exposure to nature may reduce the symptoms of Attention Deficit Hyperactivity Disorder (ADHD)"* (p. 34). In his follow-up book The Nature Principle, Louv (2011) writes,

"School gardening can improve students' learning and behavior; students participating in gardening had improved school attitude and teamwork and expanded learning opportunities." (p. 30).

Society has also witnessed the introduction of other concepts such as horticultural therapy, community supported agriculture (CSA), community gardens to increase individuals exposure to nature. These efforts come over 100 years after Liberty Hyde Bailey introduced his concept of nature study to expose elementary students to the importance of nature and gardening for their cognitive knowledge, psychomotor skills and affective human development.

Based on his work with horticulture, nature study and rural life, President Roosevelt asked Bailey to chair the Commission on Country Life in 1908. His pioneering work with this important commission is still being discussed and debated over 100 years after its inception (Peters and Morgan, 2004). A biography of Bailey on the Liberty Hyde Bailey Museum website (n.d.) provides the following description of this exceptional individual: *"Liberty Hyde Bailey was an American polymath. His work during the 20th century impacted so many areas of study that it is difficult to assign Bailey a singular historical role. A naturalist at heart, Bailey's childhood passion for learning the living world around him brought acclaim for his visionary work in Botany, Education, Environmentalism and Horticulture."*

Recommendation

Based on the results and conclusions of this study, the researcher recommends that the writings of Liberty Hyde Bailey be infused into elementary, secondary and postsecondary instruction in education, horticulture, agriculture and agricultural education. Bailey's philosophy on environmental stewardship should be studied by every student in colleges of agriculture at land-grant colleges. While Bailey's writings have long been recognized in the horticultural field, they are not as well known in other areas of agriculture. Bailey's book The Holy Earth (Bailey, 2008) has recently been republished; other books by the scholar should be added to the reading libraries of secondary agricultural education programs and agricultural courses in land-grant universities. Bailey's idea of nature-study for elementary students should also be revisited. In this era of reduced budgets and lack of quality educational facilities, Bailey's theory of using nature to stimulate children's imagination should be revised.

Liberty Hyde Bailey was one of the most important writers, educators and scholars in the history of agriculture in the United States. While he is

remembered as the father of modern horticulture, his life consisted of much more than just plants. He loved all parts of nature and the country life he so embraced. He should be remembered along with other noted individuals, as one of the pioneers of agricultural education in the United States.

Literature Cited

Bailey, L.H. 1897. What is nature-study? Leaflet I. May 1, 1897. Retrieved from http://lhbm.south-haven.com/

Bailey, L.H. 1908. The state and the farmer. New York: The MacMillan Company.

Bailey, L.H. 1909. The principles of agriculture: A text-book for schools and rural societies. New York: The MacMillan Company.

Bailey, L.H. 1910. The training of farmers. New York: The Century Co.

Bailey, L.H. 1911a. The nature-study idea: An interpretation of the new school-movement to put the young into relation and sympathy with nature (4th ed). New York: The MacMillan Company.

Bailey, L.H. 1911b. The country-life movement in the United States. New York: The MacMillan Company.

Bailey, L.H. 1915. The outlook to nature. New York: The MacMillan Company.

Bailey, L.H. 2008. The holy earth. East Lansing, MI: Michigan State University Press.

Banks, H.P. (1994). Liberty Hyde Bailey 1858-1954. Washington, DC: National Academy Press.

Camp, W.C. 1987. Smith, Hughes, Page and Prosser. The Agricultural Education Magazine 59(8):5-7.

Camp, W.C. and J.R. Crunkilton. 1985. History of agricultural education in America: The great individuals and events. Jour. of the American Association of Teacher Educators in Agriculture 26(1):21-28.

Commission on Country Life. 1911. Report of the commission on country life. New York: Sturgis and Walton Company.

Cornell University Library (n.d.). Liberty Hyde Bailey: A man for all seasons. Retrieved from http://rmc.library.cornell.edu/bailey/index.html

Dorf, P. 1956. Liberty Hyde Bailey: An informal biography. Ithaca, NY: Cornell University Press.

Liberty Hyde Bailey Museum (n.d.). Liberty Hyde Bailey Biography: A Michigan born visionary (1858-1954). Retrieved from http://lhbm.south-haven.com/.

Louv, R. 2006. Last child in the woods. Chapel Hill, NC: Algonquin Books.

Louv, R. 2011. The nature principle. Chapel Hill, NC: Algonquin Books.

McCormick, V.E. and R.W. McCormick. 1984. A. B. Graham: Country schoolmaster and extension pioneer. Worthington, OH: Cottonwood Publications.

Moore, G.E. 1987. The status of agricultural education prior to the Smith-Hughes act. The Agricultural Education Magazine 59(8):8-10.

Moore, G.E. 1988. The forgotten leader in agricultural education: Rufus W. Stimson. Jour. of the American Association of Teacher Educators in Agriculture 39(3):50-58.

Using Bailey in the Classroom: Nature Study (n.d.). Liberty Hyde Bailey Museum. Retrieved from http://lhbm.south-haven.com/.

Peters, S. 2006. "Every farmer should be awakened." Agricultural History 80(2):190-219.

Peters, S.J. and P.A. Morgan. 2004. The country life commission: Reconsidering a milestone in American agriculture history. Agricultural History 78(3):289-316.

Crisis Communication Needs Assessment: A Delphi Study to Enhance Instruction for Agricultural Communicators and Other Stakeholders[1]

Leslie D. Edgar[2], Don W. Edgar[3] and Allyson McGuire[4]
University of Arkansas
Fayetteville, AR

Tracy A. Rutherford[5]
Texas A&M University
College Station, TX

David L. Doerfert[6]
Texas Tech University
Lubbock, Texas

Theresa Pesl Murphrey[7]
Texas A&M University
College Station, TX

Abstract

Agricultural communicators and industry stakeholders need to develop, prepare and implement crisis communication plans to help assure the sustainability of the agricultural industry. This study sought to determine competencies, traits, skills and tools needed by agriculture crisis communication professionals who manage public communication during times of turmoil. The researchers used a five-round Delphi to identify crisis communicator needs and the extent to which the identified competencies, traits, skills and tools exist in and with industry professionals. Eight major crisis communication need areas were identified and verified in the first two Delphi rounds: (a) areas of experience; (b) communication, media and technical skills; (c) contingency plans and preparedness; (d) learning/training needs and opportunities; (e) media and technical skills; (f) networking opportunities; (g) personal traits; and (h) supplies and tools. Round three employed a five-point Likert-type scale to rank the eight identified need areas. Eleven independent items from the eight need areas for crisis communicators were noted with 100% acceptance for being highly important ($M = 5$, $SD = 0$) competencies, traits, skills and tools. There was no single crisis communication competency, trait, skill and/or tool where 100% of the participants ranked themselves as expert. Final rounds created a succinct, yet comprehensive and validated list of competencies, traits, skills and tools needed to train crisis communicators. Strategies

[2] Associate Professor, Department of Agricultural and Extension Education, 205 Agriculture Building; Phone: 479-575-6770; Email: ledgar@uark.edu

[3] Assistant Professor, Department of Agricultural and Extension Education, 205 Agriculture Building; Phone: 479-575-2037; Email: dedgar@uark.edu

[4] M.S. AEED Graduate and Editorial Designer at Drive, Department of Agricultural and Extension Education

[5] Associate Professor and Associate Department Head for Undergraduate Programs, Department of Agricultural Leadership, Education and Communications, 264 Agriculture and Life Sciences Building; Phone: 979-458-2744; Email: rutherford@tamu.edu

[6] Associate Chair and Professor, Department of Agricultural Education and Communications, MS 42131, Room 109; Phone: 806-742-2816; Email: david.doerfert@ttu.edu

[7] Assistant Professor, Department of Agricultural Leadership, Education and Communications, 128J Agriculture and Life Sciences Building; Phone: 979-458-2749; Email: tmurphrey@tamu.edu

and recommendations for improving crisis communications education and training are noted.

Introduction

Crisis communication management is important to the agricultural industry for a multitude of reasons, particularly because agriculture is crucial to human existence. The success of agriculture is often dependent on ideal weather, prevention of contamination, access to clean water and production of enough food, fiber and fuel to sustain the world. When issues arise preventing the success of agricultural practices, communication professionals must be prepared to manage the people involved with the crisis and reduce negative impacts—whether human, animal, or environmental. The nature of crisis management is not just to maintain a favorable image in the eye of the public but to protect the public. *"Crisis communicators must be prepared to manage situations caused by both internal and external catalysts"* (Whiting et al., 2004, p. 2). Whether caused by a natural disaster or by internal factors such as miscommunication, product failure, or infrastructure issues, agricultural crisis communicators must learn to prepare for many situations and effectively implement a crisis plan when the need arises.

"A situation becomes an immediate 'crisis' communication problem when it draws extensive media attention and requires public response through media" (Whiting et al., 2004, p. 2). This demonstrates the importance of good communication and media skills, especially when safety or the future of a company is involved. Pertaining to agriculture, the ability for a crisis to reach small to large amounts of people very quickly is not only possible but inevitable. Because many possible crises are potentially damaging, the importance of preparedness and effective training are critical. We live in a society continually affected by natural disasters, such as hurricanes, tsunamis and forest fires, and by organizational crises, such as food-borne illnesses, corporate malfeasance and terrorism. No community and no organization, public or private, is immune from crises (Ulmer et al., 2007, p. 3).

Crises have been called "predictably unpredictable" (Heath and Miller, 2004). Effective managers understand that crises can occur; but they do not know when they will occur. Good managers recognize that crisis communications must move beyond storytelling to gain, renew and increase public perception and trust (Heath, 2004). Previous research noted that *"unfortunately, the number of crises impacting citizens and the agriculture and life science areas are increasing"* (Edgar et al., 2009, p. 2). The ability to emerge from crises such as these is fully dependent on an organization's ability to effectively and efficiently manage through the crisis event. Even though all types of organizations are vulnerable to a crisis, certain industries are inherently more prone to a crisis event based on interconnectedness and complexity (Pauchant and Mitroff, 1992). Because of this, it is important to look at crises preparation more than just from a single organizational viewpoint. Unfortunately, "few organizations are prepared to effectively deal with inevitable crises" (Edgar et al., 2009, p. 3).

"True crises have several critical dimensions in common, any one of which, if handled poorly, can disrupt or perhaps destroy best efforts at managing any remaining opportunities to resolve the situation and recover, rehabilitate, or retain reputation" (Lukaszewski, 1999, p. 1). Telg (2010) described several characteristics that all crises have in common—noting that they: (a) are potentially damaging; (b) can create improper or distorted perceptions; (c) are almost always disruptive to the organization; and (d) generally always take the organization by surprise. According to Lukaszewski (1999), the most challenging part of crisis communication is reacting—with the right response quickly. Therefore, organizations must be ready, willing and able to effectively prepare for, react to and manage a crisis.

Demand is especially high for communicators trained to deal with complex and controversial issues such as food safety, environmental conservation and genetic modification of plants and animals (Burnett and Tucker, 1990). Additionally, Finch and Crunkilton (1989) noted the vital importance of ensuring that curriculum content reflects the needs of the professional world.

The need for crisis communication professionals to have personal traits, tools, skills, competencies and plans in place prior to a crisis is critical regardless of the agricultural segment involved. However, currently no comprehensive list of crisis communications competencies, traits, skills and tools needed is available. Therefore, an understanding of crisis communicators' needs to effectively manage a crisis was deemed essential to the foundational preparation of communicators in the agricultural sector. Furthermore, a need for understanding how to utilize the communication needs to train and teach future professionals in this field would facilitate the success of these efforts. Therefore, this study was used to assess crisis communication professionals' needs in an effort to create future instruction that can more holistically train students.

A Model for Developing Problem-Centered Curriculum for Crisis Communication

This study used multiple theories of learning in an effort to build a solid foundation to integrate crisis communications needs into a curriculum that would better prepare future professionals. Because this study was used to guide the development of a semester-long crisis communications course at three large universities, it was important for the researchers to have a solid foundation in learning theory. The theories outlined in this section were used to develop a model that would be used to guide the larger, longitudinal study (see Figure 1). This study focused only on Phase I of the three-phase model in Figure 1. Recommendations from this study were used to conduct research for Phases II and III of the model identified in Figure 1.

Learners have changed because of the influx of technology and pedagogy has followed suit (Leigh, 2006). Because of this change, it is essential to understand competencies, traits, skills and tools required by communication professionals in an effort to improve teaching in this area (Kort et al., 2001). By understanding the needs of future crisis communications professionals and identifying best practices in which to implement the findings (longitudinal study), a model for future curriculum development based on the needs

identified in this study could be developed. Therefore, understanding the pedagogical concepts participants have experienced and those competency areas needed to impact future crisis communication professionals grounded the foundation of this study.

Reviewing the evolution of the learning process and understanding current theoretical foundations of education are important concepts for this study. In the last century, education has shifted from recitation literacy to extraction literacy (Edgar, 2011). Instead of memorizing and reciting information, learners must now be able to understand, process and apply material and skills learned. This shift in educational practices has resulted in the need to further process information resulting in specific knowledge need analysis and the creation of educational innovations to transform the classroom and allow students to more adequately prepare for professional careers. Constructivism has been used to represent a collection of theories, including generative learning (Wittrock, 1990), discovery learning (Bruner, 1961), and situated learning (Brown et al., 1991). The theory of constructivism suggests that individuals actively construct knowledge by working to solve realistic problems, usually in collaboration with other learners (Duffy et al., 1993). When preparing students to be effective and successful crisis communicators, applying a constructivist learning model

Figure 1. A Model for Developing Problem-Centered Curriculum for Crisis Communications
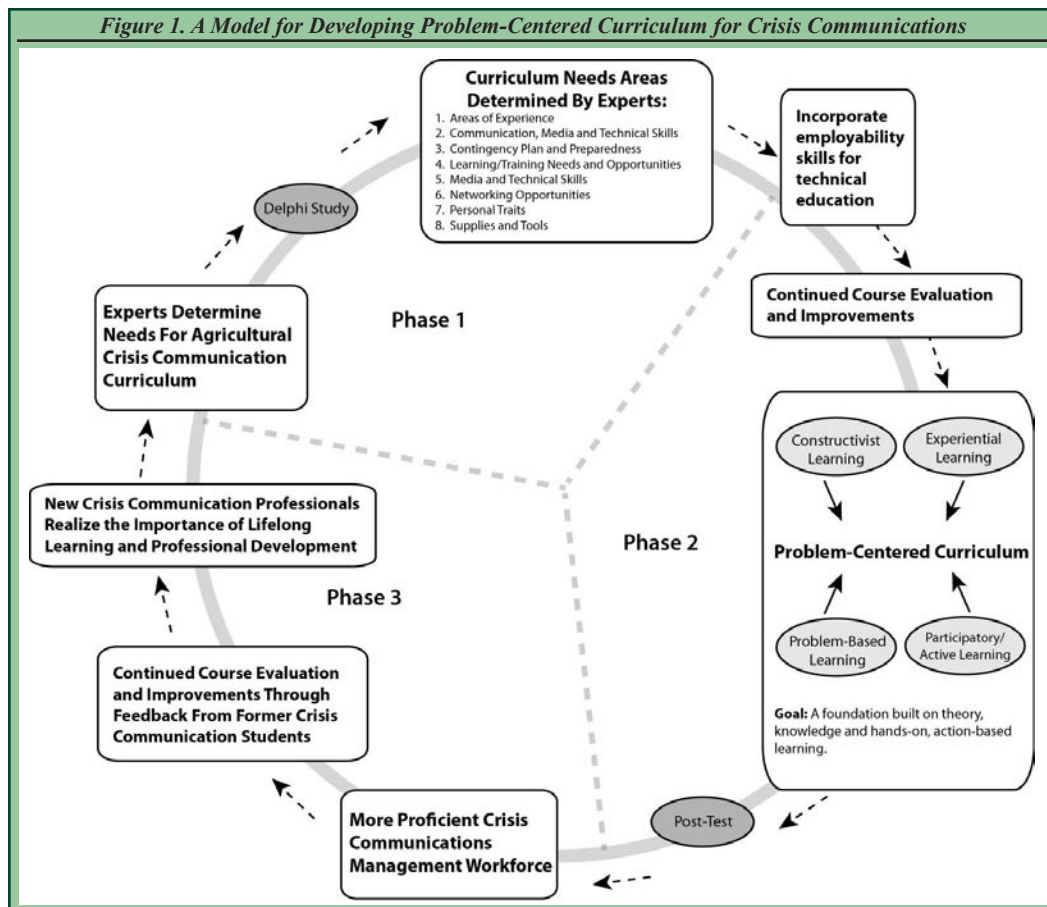
may be appropriate, because it allows students to learn skills and competencies using a hands-on approach.

Experiential learning is the process where knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming the experience (Kolb, 1984). Problem Based Learning has been described as *"particularly effective in helping students develop the ability to apply concepts and ideas to practical experience and vice versa"* (University of Southern California Center for Excellence in Teaching [USC-CET], 2006, 1). With Problem Based Learning, students can work in groups or alone and *"try to formulate the problem in terms they can understand, decide what information they need to solve it, find the information and re-iterate the process until the problem is solved"* (Wood, 2004, p. 1). Problem based learning is an integral focus when preparing to be a crisis communicator, as the problem-solving process is a large part of working through a crisis (Whiting et al., 204).

Active or participatory learning is also critical to the success of problem-centered curriculum, as active learning requires that students be engaged in the learning process in the classroom. With active learning, students must participate in and think about the material being presented in the classroom. A persons' experience is related to their knowledge, understanding and involvement in a subject area (Dewey, 1938; Kolb, 1984).

By understanding the learning theories outlined in this study, the researchers attempted to meet the need for a modern, useful and relevant curriculum in agricultural crisis communications by suggesting potential strategies and recommendations for improving education and training. By using crisis communication professionals to identify needs for future professionals' and with a strong model for active learning, the researchers attempted to create understanding, focus and a model to guide curriculum development that included critical competencies, traits, skills and tools needed to train students. An exhaustive review of literature did not yield a model precise enough to guide this study and the larger project; therefore, a model was developed to guide the creation, implementation and evaluation of crisis communication curriculum needed to train students at three universities (Figure 1).

Purpose of Study and Objectives

The integration of curriculum needs established by crisis communication professionals, combined with a problem-centered curriculum model for learning supported the purpose of this study and the ultimate goal of crisis communications-develops the ability to train students who are ready to deal with crises before and after they occur as well as the critical areas in between. The purpose of this study was to determine crisis communication training needs for new professionals in an effort to guide crisis communications curriculum. Additionally, the study sought to outline competencies, personal traits, skills and tools needed to train postsecondary students in crisis communications. The objectives established to achieve the purpose of the study included:

1) Identify crisis communication needs for new professionals using a Delphi study with crisis communication professionals.

2) Identify the competencies, traits, skills and/or tools within each need area believed to be important to successfully manage a crisis.

3) Outline competencies, traits, skills and tools best taught through application based on simulation, application based on real-life experience, theory, both and/or neither.

Methods

This study used mixed methodologies to gather information regarding the needs of crisis communication professionals in an effort to improve education and training at three large universities in the South. The needs assessment gathered responses from crisis communication industry professionals via a five-round Delphi study administered using a web-based electronic survey (Survey Monkey).The Delphi technique is a widely used and accepted method for gathering data from respondents within their domain of expertise. The technique is designed as a group communication process which aims to achieve a convergence of opinion on a specific real-world issue (Hsu and Sandford, 2007, p. 1).

The study sought to provide emerging themes of educational content needs for future crisis communication professionals based on responses from industry professionals. Further, analysis was conducted to determine the level of importance of each area of educational and training content needed for crisis communication professionals and identify the level of skill and/or knowledge industry professionals had in each area specified.

Subjects were identified for this study using the snowball sampling technique in which subjects were given the opportunity to provide researchers with the name of another person, who could provide the name of a third subject and so on (Vogt, 1999). As the first step in the process, 49 crisis communication professionals from three professional organizations

(National Agri-Marketing Association [NAMA], Canadian Agri-Marketing Association [CAMA] and the Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Services [ACE]) were identified and asked to suggest one person each. Thirty-one professionals agreed to participate. Previous research has indicated that 13 to 15 participants would provide a high degree of reliability with a Delphi Study (Dalkey, 1972; Martin and Frick, 1988). Industry professional respondents were given a four-digit participant code that was used in future survey rounds. This allowed respondents to remain anonymous while enabling the researchers to identify which respondents remained active in the study through each subsequent round(s).

The first two rounds of the Delphi collected a broad range of competencies, personal traits, supplies and information needed by crisis communicators. These competencies were compressed and organized into nine competency area categories by the researchers. Prior to round three, researchers recompressed the nine competency areas into eight competency areas. Round three began a more in-depth narrowing process for participants. An edited list for each content area was presented to participants based on results of round two. Participants were asked to use two, five-point Likert type scales to rank each need identified in the nine competency areas noted in rounds one and two. During round four, participants were given feedback from the previous round. This round provided an ordered list from each content area, with a weighted score given to each item in each need area based on the ranking from the five-point Likert type scale in round three. For each of the eight crisis communication need areas, a ranked competency list of supporting topics (from most to least important) for each broad area was provided to participants, where they were allowed to re-order the supporting need list in order of importance. Participants were also asked to identify specific demographic information including location of company, job title, company name, years of experience, degree(s) obtained and specific select information about their current career. Round five solicited participants to view the most important ranked items from round four and determine if each supporting topic under the eight broad competency areas should be taught via: (a) application based on simulation; (b) application based on real life experience; (c) theory only; (d) both theory and application; or (e) none. Because the results of each round determined the content for the subsequent round, each questionnaire and scale provided to respondents was adjusted according to the needs and purpose of each round.

The open-ended response questions used in each round of this study were validated for relevance of content and face validity by a group of faculty and graduate students at three large Southern universities. This group of professionals validated the content compressed between rounds of the study to ensure accuracy. Credibility of the study and method of data collection was created through *"the inclusion of a clear decision trail that defends the appropriateness of the method to address the problem selected, choice of expert panel, data collection procedures, identification of justifiable consensus levels and means of dissemination and implementation"* (Powell, 2003, p. 4). Because of the broad nature of this study five rounds of the Delphi assessment were needed to meet consensus of crisis communications needs with supporting competencies, traits, skills and tools for success as a new professional.

Data was assessed using SPSS PASW 18 software. Results of the Delphi study were reported based on rankings of importance for competency and need areas. Results were also reported regarding which competencies were best taught using application, theory, both and/or neither. For each of the identified competency areas needed in curriculum, a ranked list of supporting topics (competencies, traits, skills and tools) was reported along with the mean and standard deviation. Data reporting how crisis communications competencies should be taught via curriculum are reported with percentages.

Results and Discussion
Objective 1: Identify Crisis Communication Needs for New Professionals Using a Delphi Study with Crisis Communication Professionals

In the first round of the study, respondents were asked a broad open-ended question to determine what crisis communication professionals needed in order to be prepared for potential crisis events. Because the question was open-ended and designed to elicit many ideas from respondents, results from round one were extremely varied and extensive. In round two, participants were asked to verify and add or eliminate details associated with nine emergent theme need areas. This resulted in eight themes with supporting competencies being identified for each. Between rounds the themes "media skills" and "technical communication skills" were compressed into one crisis communications need area. The resulting eight identified crisis communication training/curriculum need themes are noted below.

Eight Emergent Need Areas for Crisis Communication Professionals as a Result of the Delphi Round Two Data:

1. Networking Opportunities
2. Communication, Media and Technical Training
3. Supplies and Tools
4. Learning/Training Needs and Opportunities
5. Areas of Experience
6. Knowledge
7. Personal Traits
8. Contingency Plans and Preparedness

Objective 2: Identify the Competencies, Traits, Skills and/or Tools within Each Need Area Believed to be Important to Successfully Manage a Crisis

Round three evoked an in-depth narrowing process for participants. An edited list for each theme area was presented to participants based on results of round two. The eight competency areas were split into two groups of four competencies, creating a "Round 3A" and "Round 3B" survey and participants were randomly assigned one of the instruments. This was designed to reduce participant exhaustion. Participants used a five-point Likert-type scale to rank each competency, trait, skill and tool identified under each of the eight crisis communication need areas. The scale prompted participants to rank *"How important is this competency, trait, skill and tool for new crisis communication professionals?"* on a scale of one to five (1 = Unimportant to 5 = Important). The most important needs were selected by mean score and it was determined that all need areas (competencies, traits, skills and tools) scoring a mean of 4.0 to 5.0 would be considered the most important items within each of the eight thematic content areas. As a result, each of the eight crisis communication need areas had varying numbers of supporting competencies, traits, skills and tools identified as important techniques for each content area (14 to 27 specific supporting needs for each of the eight broad thematic content areas).

For round four, participants were given feedback from the previous round. Responses were collected based on the information from round three. For each of the eight content areas, participants ranked the most important competencies, traits, tools and skills for each need area (a mean score of 4.0 to 5.0). The crisis communication needs listed within each of the eight content areas ranged from

five to 21 items. Participants were asked to rank each item in order of importance, with one being the most important.

The Networking Opportunities content area maintained five possible need areas for crisis communicators to be successful in the industry. The needs were ranked from lowest to highest mean score. The most important Networking Opportunities were "Administrators and Executives" (M = 3.07; SD = 1.90) and "Experts on Subject Matter Related to Respective Organization" (M = 3.60; SD = 2.03). The remaining need areas are noted in Table 1.

The Communication, Media and Technology Training content area had 10 needs noted as important. Respondents rank ordered each item from most to least important (Table 2). The most important Communication, Media and Technology Training was "Accurate and Clear Communication Skills" (M = 4.31; SD = 4.53) followed by "Critical Thinking Skills" (M = 5.94; SD = 4.27).

The Supplies and Tools content area had five need items that respondent's ranked as most important to crisis communication professionals (Table 3).

Table 1. Respondent's Ranking of Importance of Networking Opportunities (n = 15)

Rank	Networking Opportunities	M	SD
1	Administrators and executives	3.07	1.90
2	Experts on subject matter related to respective organization	3.60	2.03
3	Primary staff (direct and indirect)	3.87	2.36
4	Customers, clients and audience (internal and external)	4.53	1.92
5	Media outlets	4.67	2.72

Table 2. Respondent's Ranking of Importance of Communication, Media and Technology Training (n = 16)

Rank	Communication, Media and Technology Training	M	SD
1	Accurate and clear communication skills	4.31	4.53
2	Critical thinking skills	5.94	4.27
3	Analytical thinking skills	6.10	5.53
4	Strategic thinking skills	7.40	6.42
5	Communication skills both in a crisis and non-crisis situation	7.81	5.76
6	Quick and rational decision-making skills	7.88	5.18
7	Message construction skills	8.00	4.31
8	Ability to meet deadlines and remain timely	9.56	5.70
9	Media and understanding of how they differ, and skills to target different media outlets and communication professionals	9.88	4.15
10	Good listening skills	10.10	5.70

Table 3. Respondent's Ranking of Importance of Supplies and Tools (n = 19)

Rank	Supplies and Tools	M	SD
1	Cell phones	3.16	2.22
2	Digital and print versions of the crisis plan	3.53	3.10
3	Computers	4.00	2.33
4	Emergency notification system	4.68	3.25
5	Updated databases and office files accessible from anywhere	4.89	2.10

Table 4. Respondent's Ranking of Importance of Learning/Training Needs and Opportunities (n = 15)

Rank	Learning/Training Needs and Opportunities	M	SD
1	Crisis identification training (issues tracking, recognition and planning)	2.07	1.03
2	Communication training	2.13	1.20
3	Training for writing and conveying key messages	3.40	1.35
4	Stakeholder identification training	3.60	1.24
5	Non-crisis media exposure training	3.80	1.38

Table 5. Respondent's Ranking of Importance of Areas of Experience (n = 19)			
Rank	Areas of Experience	M	SD
1	Verbal and written communication	2.26	1.28
2	Leadership	2.47	1.26
3	Media relations	3.11	1.41
4	Public relations	3.58	1.21
5	Being a member of a crisis communication team	3.58	1.50

Table 6. Respondent's Ranking of Importance of Knowledge (n = 19)			
Rank	Knowledge	M	SD
1	Crisis knowledge (familiarity with issues, potential crises, responses and plans of action)	2.26	2.88
2	Comprehensive understanding of company/organization and its crisis plan and dynamics	4.26	3.02
3	How to troubleshoot and address problems before they lead to a crisis	5.63	4.19
4	Types of crises potentially affecting organization	6.42	4.25
5	Knowledge of various stakeholder groups and understanding of their perspectives	7.05	3.37
6	Risk communication principles	7.32	4.00
7	Clear definition of the difference between an issue and a crisis	7.53	4.80
8	Roles, duties and responsibilities of crisis team (both internal and external)	7.84	3.60
9	Audiences for specific scenarios and key concerns for each``	8.26	3.43
10	Knowledge and understanding of organization's non-crisis objectives	9.05	5.36

Table 7. Respondent's Ranking of Importance of Personal Traits (n = 15)			
Rank	Personal Traits	M	SD
1	Strategic thinker	5.00	5.60
2	Good judgment	6.20	3.53
3	Integrity	6.47	4.84
4	Honesty	6.60	4.70
5	Team-oriented	7.73	5.80
6	Calm demeanor	8.60	5.45
7	Ability to prioritize	9.33	4.40
8	Common sense	9.60	4.00
9	Ability to collaborate	9.60	5.90
10	Confidence	10.73	5.61

Table 8. Respondent's Ranking of Importance of Contingency Plans and Preparedness (n = 15)			
Rank	Contingency Plan and Preparedness	M	SD
1	Crisis communication plans (including 15-minute plan, four hour plan, day one plan and weeks one and two plans)	2.33	1.71
2	Core team identification and organization	3.67	3.00
3	Chain of command with identification of key personnel	4.07	3.00
4	Contact lists (media, staff, leadership, counsel, etc.)	5.33	4.20
5	Designated spokesperson (not same person managing crisis)	7.93	3.83
6	Early warning/notification system	8.07	4.00
7	Vulnerability assessments	8.40	5.41
8	Develop a process and protocol for gathering and disseminating information	8.47	2.92
9	Prepared statements and talking points ready for media interviews	9.33	3.80
10	Identify possible crises at staff meetings	9.40	4.10

Respondents rank ordered each item from most to least important in terms of supporting tools needed to be successful in a crisis communications career. The most important Supply and Tool need was "Cell Phones" (M = 3.16; SD = 2.22) and the second most important was "Digital and Print Versions of the Crisis Plan" (M = 3.53; SD = 3.10).

The Learning/Training Needs and Opportunities content area had five needs noted as important (Table 4). The highest ranking item was "Crisis Identification Training (issues tracking, recognition and planning)" (M = 2.07; SD = 1.03) followed by "Communication Training" (M = 2.13; SD = 1.20).

The content theme area of Areas of Experience had five items ranked by participants as the most important needs (Table 5) The Area of Experience with the lowest mean was "Verbal and Written Communication" (M = 2.26; SD = 1.28) followed closely by "Leadership" (M = 2.47; SD = 1.26).

The Knowledge content area had 10 supporting items (Table 6). The most important item with the lowest mean in this content area was "Crisis Knowledge" (M = 2.26; SD = 2.88). The second most important item in rank was "Comprehensive Understanding of Company/Organization and its Crisis Plan and Dynamics" (M = 4.26; SD = 3.02).

The Personal Traits content area with supporting need items ranked from most to least important are identified in Table 7. The most important item reported was being a "Strategic Thinker" (M = 5.00; SD = 5.60) followed by "Good Judgment" (M = 6.20; SD = 3.53).

The rankings of most to least important supporting items for the Contingency Plans and Preparedness content area are listed in Table 8. The highest-ranked items were "Crisis Communication Plans" (M = 2.33; SD = 1.71) and "Core Team Identification and Organization" (M = 3.67; SD = 3.00).

Objective 3: Outline Competencies, Traits, Skills and Tools Best Taught through Application Based on Simulation, Application Based on Real-Life Experience, Theory, Both and/or Neither

Round five assessed respondents' views of how the most important competencies, traits, skills and tools for each crisis communications need area should best be presented to students training to become crisis communication professionals. Because of the nature of the problem-centered curriculum model (Figure 1), multiple avenues for teaching crisis communication competencies and skills are necessary. Professionals participating in the Delphi study were asked to choose all training areas they believe applied to each competency, trait, skill and/or tool item identified in each of the eight crisis communication content need areas. Respondents were asked to choose from: (a) application based on simulation; (b) application based on real-life experience; (c) theory; (d) both application and theory; and (e) neither application nor theory.

Table 9. Teaching Techniques Needed to Train New Crisis Communication Professionals in Regards to the Eight Broad Competency Areas (n=16)					
Ranking of Competencies and Supporting Traits by Competency Area	Application Based on Simulation %	Application Based on Real-Life Experience %	Theory %	Both Application and Theory %	Neither Application nor Theory %
Networking Opportunities					
1. Administrators and executives	43.8	68.8	12.5	37.5	0.0
2. Experts on subject matter related to respective organization	37.5	68.8	6.3	37.5	0.0
3. Primary staff (direct and indirect)	37.5	75.0	12.5	31.3	0.0
4. Customers, clients and audience (internal and external)	50.0	68.8	6.3	31.3	0.0
5. Media outlets	37.5	75.0	12.5	37.5	0.0
Communication, Media, and Technology Training					
1. Accurate and clear communication skills	37.5	62.5	18.8	50.0	0.0
2. Critical thinking skills	43.8	62.5	25.0	50.0	0.0
3. Analytical thinking skills	43.8	62.5	12.5	50.0	6.3
4. Strategic thinking skills	31.3	68.8	25.0	56.3	6.3
5. Communication skills both in a crisis and non-crisis situation	37.5	75.0	25.0	56.3	0.0
6. Quick and rational decision-making skills	37.5	75.0	0	43.8	0.0
7. Message construction skills	43.8	68.8	25.0	56.3	0.0
8. Ability to meet deadlines and remain timely	43.8	56.3	6.3	37.5	0.0
9. Media and understanding of how they differ, and skills to target different media outlets and communication professionals	25.0	68.8	18.8	56.3	0.0
10. Good listening skills	37.5	75.0	12.5	50.0	0.0
Supplies and Tools					
1. Cell phones	37.5	75.0	0	12.5	0.0
2. Digital and print versions of the crisis plan	50.0	62.5	0	31.3	6.3
3. Computers	37.5	68.8	0	12.5	6.3
4. Emergency notification system	50.0	62.5	6.3	25.0	0.0
5. Updated databases and office files accessible from anywhere	43.8	62.5	6.3	18.8	0.0
Learning/Training Needs and Opportunities					
1. Crisis identification training (issues tracking, recognition and planning)	50.0	75.0	12.5	56.3	0.0
2. Communication training	43.8	68.8	37.5	75.0	0.0
3. Training for writing and conveying key messages	50.0	62.5	25.0	62.5	0.0
4. Stakeholder identification training	56.3	68.8	0	50.0	0.0
5. Non-crisis media exposure training	31.3	68.8	25.0	56.3	6.3
Areas of Experience					
1. Verbal and written communication	43.8	75.0	12.5	56.3	0.0
2. Leadership	37.5	81.3	6.3	56.3	0.0
3. Media relations	43.8	81.3	12.5	56.3	0.0
4. Public relations	37.5	81.3	12.5	50.0	0.0
5. Being a member of a crisis communication team	43.8	81.3	12.5	37.5	0.0
Knowledge					
1. Crisis knowledge (familiarity with issues, potential crises, responses and plans of action)	68.8	68.8	18.8	43.8	0.0
2. Comprehensive understanding of company/organization and its crisis plan and dynamics	37.5	75.0	6.3	43.8	0.0
3. How to troubleshoot and address problems before they lead to a crisis	68.8	75.0	18.8	62.5	0.0
4. Types of crises potentially affecting organization	62.5	62.5	25.0	43.8	0.0
5. Knowledge of various stakeholder groups and understanding of their perspectives	50.0	81.3	6.3	31.3	0.0
6. Risk communication principles	50.0	62.5	37.5	62.5	0.0
7. Clear definition of the difference between an issue and a crisis	43.8	68.8	37.5	56.3	0.0
8. Roles, duties and responsibilities of crisis team (both internal and external)	62.5	62.5	25.0	50.0	0.0
9. Audiences for specific scenarios and key concerns for each	50.0	62.5	18.8	37.5	0.0
10. Knowledge and understanding of organization's non-crisis objectives	43.8	68.8	25.0	50.0	0.0
Personal Traits					
1. Strategic thinker	37.5	50.0	12.5	62.5	0.0
2. Good judgment	37.5	68.8	6.3	37.5	0.0
3. Integrity	18.8	56.3	12.5	37.5	6.3
4. Honesty	18.8	56.3	12.5	37.5	6.3
5. Team-oriented	37.5	56.3	12.5	56.3	0.0
6. Calm demeanor	31.3	62.5	6.3	31.3	12.5
7. Ability to prioritize	43.8	43.8	6.3	62.5	0.0
8. Ability to collaborate	43.8	37.5	12.5	56.3	0.0
9. Common sense	25.0	56.3	6.3	31.3	12.5
10. Confidence	31.3	62.5	6.3	37.5	0.0
Contingency Plans and Preparedness					
1. Crisis communication plans (including 15-minute plan, four hour plan, day one plan and weeks one and two plans)	62.5	62.5	18.8	56.3	0.0
2. Core team identification and organization	56.3	56.3	6.3	50.0	0.0
3. Chain of command with identification of key personnel	50.0	62.5	12.5	37.5	0.0
4. Contact lists (media, staff, leadership, counsel, etc.)	43.8	68.8	6.3	37.5	0.0
5. Designated spokesperson (not same person managing crisis)	37.5	68.8	18.8	43.8	0.0
6. Early warning/notification system	50.0	56.3	12.5	56.3	0.0
7. Vulnerability assessments	68.8	62.5	25.0	43.8	0.0
8. Develop a process and protocol for gathering and disseminating information professionals	50.0	68.8	18.8	37.5	0.0
9. Prepared statements and talking points ready for media interviews	56.3	68.8	6.3	50.0	0.0
10. Identify possible crises at staff meetings	50.0	68.8	25.0	62.5	0.0

*Note. Participants could select none to all five presentation methods for each competency listed.

Crisis Communication Needs

Results are reported as percentages of respondents who believed each item should be presented to students using the respective choices (Table 9).

The majority of respondents indicated that seven of the eight content need areas should be taught to new crisis communications professionals through "application based on real-life experience" including: Networking Opportunities (68.8-75%); Communication, Media and Technology Training (56.3-75%); Supplies and Tools (62.5-75%); Learning/ Training Needs and Opportunities (62.5-75%); Areas of Experience (75-81.3%); Knowledge (62.5-81.3%); Contingency Plans and Preparedness (56.3-68.8%). Although the majority of respondents did not note the competency area of Personal Traits (37.5-68.8%) as needing to be taught through "application based on real-life experience" - a large percentage of the respondents reported new crisis communication professionals could benefit through learning the supporting competencies, traits, skills and tools identified as most important in this manner.

The majority of respondents (50-75%) noted that 31 of the 55 supporting items (competencies, traits, skills and/or tools) within the eight content theme areas should be taught to new crisis communications professionals via "both application and theory". In contrast, there was not one supporting item ranked at the majority or higher level to be taught via "theory only".

Respondents noted a wide-variety of teaching techniques needed for the content area of Knowledge. With seven out of ten supporting items (competencies, traits, skills and/or tools) ranked at 50% or above as a need to be taught through "application based on simulation". In comparison, respondents noted that all ten supporting items should be taught via "application based on real-life experience" (62.5-81.3%). In contrast, not one of the ten supporting areas for Knowledge were noted as needing to be taught via "theory only" at a 50% or higher agreement level. Additionally, teaching new crisis communications professionals through "theory" regardless of the crisis communications content area ranked low throughout each supporting competency, trait, skill and/or tool item.

Summary

Results of this Delphi study should guide the development of crisis communication curriculum/ training in the future. Findings indicate that crisis communications competencies identified are important to professionals in crisis communications. Eight overall emergent theme areas were identified by agricultural industry professionals as important content areas for students prior to entering the workforce with careers in crisis communications. The eight crisis communication content areas were: (a) networking opportunities; (b) communication, media and technical training; (c) supplies and tools; (d) learning/training needs and opportunities; (e) areas of experience; (f) knowledge; (g) personal traits; and (h) contingency plans and preparedness.

The dedicated participation and quality responses of professionals in this study show the need for and possible impact of crisis communication professionals on the lives of many. Results indicated significant content diversity needed in crisis communication curriculum. The content areas and the supporting competencies, traits, skills and/or tools for each should be added to crisis communication instruction prior to determining the importance/impact of problem-centered curriculum for crisis communicators—Phase 2 of the Model for Developing Problem-Centered Curriculum for Crisis Communications (DP-CCCC) (Figure 1). These results are deemed important to the overall structure and success of a semester-long course in crisis communication in agriculture and content areas were incorporated into a crisis communications course taught at three Southern universities.

Each crisis communications content area contained crucial need areas of training for new crisis communications professionals. While this study focused predominately on Phase 1 of the DP-CCCC Model, findings identified curriculum/training methods for each of the eight crisis communications content areas noted as important by current professionals. Findings indicated that crisis communication professional's competency, knowledge and skill level would be strengthened if taught via problem-centered curriculum, namely via "application based on real-world experience". Additionally, the results from the Delphi also showed that a varied presentation of material is necessary in order to adequately prepare students to deal with crises, including teaching via "application based on simulation" and/or "application based on real-life experience", "theory", "both" and/ or "neither".

Results of this study indicated that crisis communications professionals believed teaching the eight content theme areas via "application" of either "real-world" or "simulation" experience would be the most useful/effective mode of presenting information to future crisis communicators. Therefore, the problem-centered curriculum design, supported by modern learning theories, is a useful strategy for Phase 2 of this project. O'Connor (2004) stated that

learning associated with these types of theory based instructional designs is needed to teach students application-based curriculum within the problem-centered curriculum model. As a result of this study, not only were important curriculum items determined, but useful methods for presenting the information were determined by respondents. Results indicated that application-based learning via the problem-centered curriculum design is the best way to incorporate the eight content areas into curriculum.

Through problem-centered curriculum, new professionals have the opportunity to work through crises prior to entering the workforce and practice a problem-solving approach to crisis communication. Based on the results of this study, theory alone is not a valid method for training crisis communication professionals. Therefore, a passive approach to learning in preparation for crisis communication is not considered solely effective by respondents. Results indicated that teaching crisis communication competencies should occur through "application based on real-life experience" and "application based on simulation." Therefore, the eight identified content areas should be taught using a hands-on method to allow students to participate fully using resources that allow students to simulate the experience of a crisis and react to it. Lukaszewski (1999) noted that the most challenging part of crisis communication is reacting—with the right response quickly. Identified methods of teaching must occur through constructivism, experiential, problem-based and participatory/active learning (as noted in problem-centered curriculum – Figure 1).

Whiting et al. (2004) noted the importance of adding both internal and external catalysts to crisis communications instruction. In this study, crisis communications professionals agreed that being able to manage crises impacting both internal and external situations was necessary for success, as seen in the supporting items listed within each of the eight content areas. The crisis communication education/training needs areas developed as a result of this study showed a well-rounded, comprehensive array of information. Because University degrees are now more practitioner-oriented with an emphasis in skill and career development and a focus on pragmatic goals (Simon, 2003, p. 34), it is important for individual courses to keep pace. The results of this Delphi study directly related to the practitioner-oriented degree concept. The eight identified content need areas and corresponding supporting competencies, traits, skills and/or tasks provided the evidence of and need for a degree program that provides professional development and useful objectives for future practice.

There is a significant demand for communicators who are trained to deal with complex and controversial issues such as food safety, environmental conservation and genetic modification of plants and animals (Burnett and Tucker, 1990). Tailoring the needs of the agricultural and crisis communications industry to a degree program can produce competent and prepared individuals to enter the industry as practitioners. The competencies found in this study can help to better prepare students to become effective crisis communicators in agriculture.

Based on the data, it is recommended that results from this study be used to improve current curriculum for crisis communications. Additionally, it is important to note the competencies and skills are best taught using varying teaching and learning methods such as application or theory. Results from this study can be used to assist higher education/industry training outlets to improve curriculum and instructional methods for crisis communications education. Practitioner-based feedback validates competencies needed by future professionals allowing them to be better equipped to prepare for, manage, and recover from crises.

Literature Cited

Brown, J., A. Collins and P. Duguid. 1991. Situated cognition and the culture of learning. In: Yazdani, M. and R.W. Lawler (eds.). Artificial intelligence and education. Westport, CT: Ablex Publishing.

Bruner, J.S. 1961. The act of discovery. Harvard Ed. Review: 3121-32. Retrieved from EBSCOhost (1962-00777-001).

Burnett, C. and M. Tucker. 1990. Writing for agriculture. Kendal Hunt Publishing Co. Dubuque, IA.

Dalkey, N.C. 1972. Studies in social and economic process. Lexington, MA: Lexington Books.

Dewey, J. 1938. Experience & Education. New York, NY: Touchstone.

Duffy, T.M., J. Lowyck and D.H. Jonasses. 1993. Designing environments for constructive learning. Berlin, Germany: Springer-Verlag.

Edgar, D.W. 2011. Learning theories and historical events that have changed instructional design and education: Recitation literacy towards extraction literacy. Manuscript submitted for publication.

Edgar, L.D., K. Pennington, T. Rutherford and D. Doerfert. 2009. A crisis communications needs assessment of agricultural industry professionals to determine best practices for second life© Simulations. Paper presented at the Association of International Agricultural and Extension

Education, Saskatoon, Saskatchewan, Canada, May 24-27.

Finch, C.R. and J.R.Crunkilton. 1989. Curriculum development in vocational and technical education. Rockleigh, NH: Allyn and Bacon.

Heath, R.L. 2004. Telling a story: A narrative approach to communication during crisis. In Millar, D.P. and R.L. Heath (eds.). Responding to crises: A rhetorical approach to crisis communication. Mahwah, NJ: Lawrence Erlbaum Associates.

Heath, R.L. and P. Miller. 2004. Responding to crises: A rhetorical approach to crisis communication. Mahwah, NJ: Lawrence Erlbaum Associates.

Hsu, C. and B.A. Sandford. 2007. The Delphi Technique: Making sense of consensus. Practical assessment, Research and Evaluation 12(10):1-17.

Kolb, D. 1984. Experiential learning. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Kort, B., R. Reilly and R.W. Richard. 2001. External learning representation of a learning process and domain knowledge: Affective state as a determinate of its structure and function. In Proc. Artificial Intelligence in Education Workshops (AI-ED), San Antonio, TX, May 19-23.

Leigh, D. 2006. A brief history of instructional design. Retrieved from: http://www.pignc-ispi.com/articles/education/brief%20history.htm.

Lukaszewski, J.E. 1999. Seven dimensions of crisis communication management: A strategic analysis and planning model. Ragan's Communications Journal January/February. Available at www.e911.com/monos/A001.html

Martin, A.G. and M.J. Frick. 1998. The Delphi technique: An informal history of its use in agricultural education research since 1984. Jour. of Agricultural Education 1(39):73-79.

O'Connor, B.N. 2004. The workplace learning cycle: A problem-based curriculum model for the preparation of workplace learning professionals.

The Jour. of Workplace Learning 16(6):341-349.

Pauchant, T. and I. Mitroff. 1992. Transforming the crisis prone organization. Jossey-Bass Publishers, San Francisco, CA.

Powell, C. 2003. The delphi technique: myths and realities. Jour. of Advanced Nursing 41(4):376-382.

Simon, L. 2003. The assessment and design of an agricultural communications curriculum at the master's level: A Delphi study. Master's Thesis. Texas Tech University, Lubbock, TX.

Telg, R. 2010. Risk and crisis communication: When things go wrong. Agricultural Education and Communication Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, WC093:1-9.

Ulmer, R.R., L. Sellnow and M.W. Seeger. 2007. Effective crisis communication: Moving from crisis to opportunity. Thousand Oaks, CA: Sage Publications.

University of Southern California Center for Excellence in Teaching [USC CET]. 2006. Case-based & problem-based teaching and learning. Retrieved from http://cet.usc.edu/resources/teaching_learning/case_based.html.

Vogt, W.P. 1999. Dictionary of statistics and methodology: a nontechnical guide for the social sciences, London: Sage.

Whiting, L.R., M. Tucker and S.R. Whaley. 2004. Level of preparedness for managing crisis communication on land grant campuses. Paper presented at the Association for Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences, Lake Tahoe, NV, June 22-24.

Wittrock, M.C. 1990. Generative process of comprehension. Ed. Psychologist 24: 45-376.

Wood, E.J. 2004. Review: Problem-based learning. Acta Biochimica Polonica 51(2):1-6.

A Case Study of the Search Phase of College Choice as Experienced Prospective Students Visiting a Midwest College of Agriculture

Sandra Klein and Shannon Washburn[1]
Kansas State University
Manhattan, KS

Abstract

Each year higher education institutions seek to recruit and attract high school graduates to their institutions. Millions of high school seniors each year are in the midst of the college choice process, attempting to determine which institution is "right" for them. This study explored college choice factors important to high school seniors in the search phase of the college choice process. To carry out this study purposeful sampling was used to select 11 high school seniors participating in individually scheduled campus visits. An interview process was used to investigate what college choice factors were important to them when choosing a university/college. Student responses were ultimately categorized into six areas: interest in a specific major/program area, reputation, ideal distance from home, family interaction with institution, factors related to paying for college and campus environment.

Introduction

In 2008, 2.1 million high school graduates (68% of all high school graduates) nationwide enrolled in post-secondary education for the fall semester immediately following their high school graduation or GED completion (U.S. Department of Education National Center for Educational Statistics, 2009). Each of these students made the choice of which institution they would attend. In 2008-2009 this meant choosing from over four thousand degree granting institutions (U.S. Department of Education National Center for Educational Statistics, 2009). Deciding where to attend college can be a confusing and overwhelming process. For the discerning student taking in all the information of recruitment materials, college visits, admissions requirements, financial aid, etc.; the goal of finding the institution that is the "perfect fit" is a formidable task.

Within the world of higher education lays the related challenge of effectively attracting and recruiting students. In the name of recruitment, colleges and universities disseminate information highlighting the best they have to offer; focusing on general collegiate concepts including campus features/characteristics, academics/faculty, co-curricular opportunities, mission/purpose and prestige/value (Hartley and Morphew, 2008; Harris, 2009). Moving beyond the general college choice factors, marketing materials tout school accolades: strong traditions of excellence, national successes, prestigious alumni, personal successes, athletic accomplishments, university mantras and other notable attributes (Harris, 2008) all in the name of attracting new applicants. Raising the stakes of effective institutional marketing and recruiting efforts is the number of first-time college and university freshman indicating they applied to four or more institutions, which reached a record high of over 60% in 2008 (Pryor et al., 2008).

Marketing an educational institution is complex and multifaceted: the college choice process involves all aspects of an institution, from athletics to faculty to student life, as well as family members, social climate, economic factors and even public policy (Kinzie et al., 2004). Hossler and Gallagher's (1987) "Three Phase Model of College Choice" is widely used as a lens through which to study the college choice process (Bateman and Hossler, 1996; Mooney, 2007; Urbanski, 2000). Hossler and Gallagher assert that prospective students move through three phases throughout the college choice process (1987). Phase 1: Predisposition is described by the authors as *"a developmental phase in which students determine whether or not they would like to continue their education beyond high school"* (Hossler and Gallagher, 1987, p. 209). Factors that contribute to a student's decision to attend a postsecond-

[1]Associate Professor

ary institution include socioeconomic status, parental expectations, career opportunities, financial aid and potential income differentials (Bateman and Hossler, 1996; Hossler and Gallagher, 1987; Maringe, 2006; Urbanski, 2000). Which variable is most important to any given student is highly subjective and specific to a particular student's personal identity (gender, ethnicity, personal experiences, educational activities, significant others etc.) (Bateman and Hossler, 1996; Hossler and Gallagher, 1987; Urbanski, 2000). The predisposition stage, although fluid and complex, is key to progressing to Phase 2: Search (Bateman and Hossler, 1996; Hossler and Gallagher, 1987).

While students entering phase two have some accrued knowledge of colleges and universities, they continue to compile and consider the factors most important to them throughout the search phase, eventually forming a "choice set" (Hossler and Gallagher, 1987). According to survey and diary research, choice set formation begins as early as students' freshman year in high school and continues through the application process (Rosen et al., 1998). Students spend phase two reading promotional materials, visiting their choice set institutions and weighing the factors most important to them, which as in phase one, are highly specific to the individual (Mooney, 2007; Rosen et al., 1998; Urbanski, 2000). Factors most often include criteria based on academic (test scores, reputation of program, etc.), social (size, location, amenities, etc.) and cost (tuition, financial assistance, etc.) elements (DesJardens et al., 1999; Mooney, 2007, Urbanski, 2000).

As students gather this information in the search phase and deliberate their decision, they move into phase three: choice. It is in the choice phase that a student makes the decision of which institution they plan to attend (Hossler and Gallagher, 1987). Although this choice is often driven by a consensus of multiple factors specific to the individual, research indicates that a connection or relationship between an institution and student can be a driving factor, as can financial assistance, size and location of the institution (Acker et al., 2004; Hossler and Gallagher, 1987; Nafukho and Burnett, 2002).

The three phases of the college choice process offered by Hossler and Gallagher, provide a framework from which to view this complex and highly individual specific deliberation process.

The present study investigated the college choice factors of prospective students in the search phase of the college choice process as they participated in a campus visit in the college of agriculture at a land grant university in the mid-west region of the United States.

Methods

In order to allow students to use their own words in describing what has influenced their decisions regarding college choice, a qualitative constructionist approach was utilized for this study. The constructionist epistemology asserts understanding of the world is derived and constructed through one's personal experiences and interactions (Crotty, 1998). Interviews were used to facilitate student reflection of their constructed wants/needs for certain characteristics of higher education. More specifically, eleven interviews were used to allow students to identify college choice factors they considered most important when selecting a college through a dialogue of students' personal experiences while in the search phase of their college choice process.

Purposeful sampling, a method of selecting "individuals and sites for study because they can purposefully inform an understanding of the research problem," and convenience sampling, using those participants that are readily available, were used in this study (Creswell, 2007, p. 125). Participants were selected from a pool of high school seniors participating in an official visit to the Kansas State University College of Agriculture during the fall or spring of their senior year in high school.

Participants were initially contacted via email to explain the purpose of the study, the collection methods, the importance of their participation and their protected rights under informed consent. Students were then interviewed on the date of their individually scheduled campus visit. The content of the initial contact email, informed consent document and interview guide were submitted to and approved by the Kansas State University Institutional Review Board. Permission to contact and interview prospective students was also given by the Kansas State University admissions office. The participant pool consisted of eleven traditionally-aged high school seniors planning to continue their education after high school. Though diversity in terms of gender, state of residence and interest area was represented, this study did not attempt to make connections between any aspect of diversity and subjects' responses. For the purposes of discussion participants in this study were assigned pseudonyms. Participant pseudonym, gender, major of interest, home state and age is presented in Table 1.

Each interview was conducted in a quiet location without time restrictions. The interview was structured with open-ended questions aimed at eliciting the subject's perspective of his/her own college choice experiences. Interview questions included:

Table 1. Participant Information				
Participant	Gender	Major of Interest	Home State	Age
Adam	Male	Agribusiness	Missouri	18
Brittany	Female	Animal Sciences and Industry	Kansas	18
Elizabeth	Female	Pre-veterinary studies	Kansas	18
Hallie	Female	Pre-veterinary studies	Missouri	18
Jane	Female	Animal Sciences and Industry	Kansas	17
Lance	Male	Agriculture Education	Kansas	17
Mandi	Female	Animal Sciences and Industry	California	18
Nick	Male	Agribusiness	Kansas	18
Randy	Male	Milling Science and Management	Kansas	18
Rheba	Female	Pre-veterinary studies	Kansas	17
Travis	Male	Milling Science and Management	Texas	18

1. Why did you decide to visit the Kansas State University College of Agriculture?

2. When you came on your visit today what did you hope to learn?

3. When you think about your future college, what factors are important to you?

4. What would you say is the most important factor influencing your decision on what college/university to attend?

5. How did you decide what colleges/universities you were interested in finding out more about?

In addition to these foundational questions, probing questions were used to encourage participants to fully consider the questions posed to them.

Using these questions to illicit a variety of responses, the researchers collapsed the data into emergent themes and categories. To maximize objectivity, the data were analyzed using several strategies. First the interviews were transcribed and member checks were utilized by contacting participants via email to verify the accuracy of transcripts. The data were then evaluated using open coding to categorize emerging themes, first independently by two parties, then by triangulating the independent results. Denzin (1978) defines triangulation as "the combination of methodologies in the study of the same phenomenon" (p. 291). Triangulation may be used to "examine the same phenomenon from multiple perspectives" (Jick, 1979, p. 603) and was utilized in the present study to enhance the trustworthiness of the findings.

Results and Discussion

From the data, six categories of factors related to college choice emerged; interest in a specific major/program area, reputation, ideal distance from home, family interaction with institution, factors related to paying for college and campus environment. Specific details of these findings are as follows.

Specific Major/Program of Study

The category specific major/program of study represents student responses that their area of study was an important factor in considering which college or university they would attend. Noting that each of the students in the study were on an official campus visit to a college of agriculture provides some indication that they had already put at least a minimal degree of thought to their possible interests. Nick is an example of this broad interest that led students to visit campus: *"Agriculture is my interest and I looked up online and K-State is right up there in the top three colleges in the nation.* [student reference – authors unaware of the ranking to which the student refers] *I was hoping to learn about different careers you can go into with Ag Business. Texas A&M, Iowa State, Nebraska – I got letters from all those places. They are all agricultural based colleges."*

Randy shared, "I've always been kind of interested in agriculture." This general interest in a program area prompted these students to pursue more information through a campus visit. Other participants had more specific major interests. Travis provided an example of how a specific major led him to this visit: *"I'm really interested in the Milling program. My counselors in school, in Texas, have been talking about it and it sounds interesting and my grandparents have been talking about it so I just kind of want to see what it is about. I'm really interested here because it is an exclusive program here and there's nothing like it in the U.S. and I'm interested in how things like that work, the whole milling process. I decided based on the programs I want to go into. I want to go into engineering and agriculture and this school is good in both."*

Travis was drawn to this college by his specific interest in two programs, as well as by unique programs at this particular institution. While Travis was seeking and factoring in information regarding undergraduate programs, some participants were looking beyond undergraduate study. Hallie states, *"Probably the most important thing is the major itself and how I can learn about it. Well, I just, I looked at what colleges had both a "pre-vet" and a "vet" school. And because I didn't want to transfer to somewhere that only had a vet school."*

Other participants likewise shared "I want to become a vet" and "I know that K-State has one of the top vet schools, so that is the main factor." Although some put more emphasis on it than others, each participant made some reference to a specific major or area of study.

A Case Study of the Search Phase

Reputation

The reputation of the institution, college, or program was stated as an important factor to many of the participants of this study. Randy shared, "Kinda like…academics, a rich tradition and good reputation." Some of the participants gauged the reputation through feedback from others. Hallie shared, *"I heard from a vet that I shadowed that they* [Kansas State University] *had a really good exotic animal* [program] *and that is what I want to go into."* Similarly Adam stated, *"I've always heard from a lot of people that K-State is a good ag school. I want to major in Ag Business and go back and manage the family farm and I want to have the business background so I know the decisions and can make educated guesses on how to make the best decision for the operation. People that talked about it range from colleagues of mine that show cattle around the country to older people, alumni from K-State, teachers, most of my teachers went to school around Missouri, but most older people talk about how K-State is a good school."*

Many participants in this study cited sources they considered to be trustworthy, seen as friends, mentors, etc. who spoke about the reputation of institutions in which the participant was interested. Nick shares, "I've had some relatives graduate here and all my relatives liked it." Other participants who reported valuing the reputation of a university also gathered information from other sources. Brittany seemed to sum up the thoughts of many participants with her comment, "[I am looking for] *just a program that I can take to any place around and say I got a degree from 'there' and they will say 'oh, that's a great place to have a degree from.'"*

Although the importance of reputation was expressed differently among the participants, the shared concept of wanting to attend an institution that was seen favorably by those around them and/ or the industry/career to which they aspire was seen as in important factor in choosing a college by the participants of this study.

Ideal Distance from Home

For many students, attending an institution of higher education means moving away from home and living on their own. In this study the participants identified the "ideal distance from home" an important factor they considered when making choices regarding higher education. Many participants shared the sentiment that an institution "close to home" was desirable and that "convenience and location is a factor". Hallie shared, *"Of course distance from home played a really big factor. And so I just looked at the*

distance from home and the majors they had and that is what I decided on." Similarly, Elizabeth shared, *"I want to be a vet, so really the only place nearby to go and K-State being not far away from home, it's about an hour and 45 minute drive, so I can still see my family and everything when I want."*

Other participants were also looking for an experience further from home. Adam shared, *"I just kind of always wanted to be different in school. There was a kid who went to Hawaii and he's still there, but most kids go right around home, to Mizzou, or just kind of stay in the Missouri area. I thought about looking a little broader, keeping my options open around home, but also just looking a little broader of where everyone else goes."*

Family Interaction with Institution

While discussing what was important to them when choosing an institution, many of the participants mentioned family members in connection with their deliberations. For many students in the study, family history with given institutions was a contributing factor to choosing a college. Many participants shared "my family went here." Rheba said *"I didn't decide too much. I've basically known my whole life I wanted to go here. Both my sisters go here and I've been up here a lot and its basically like I really want to go here."* Lance shared his family connections to multiple universities and the impact it has had on his choice process, *"Both of my parents are K-State alumni and my sister was going to school up here and I've been up here quite a few times for State FFA Convention and State FFA contests and I've got a lot of family that has gone to school up here. I grew up involved in K-State and K-State sports…so a lot of family interests. K-State has always been an interest for me because of my family and I never really thought of going to Oklahoma State until my sister went down there."*

Jane's previous family interaction was more prominent than most, *"A lot of different reasons, I've grown up in the area and my dad works here so I've been on campus a lot and I like it, it's a really friendly community, you know, like everybody is nice."* Previous family interaction with universities was a contributing factor in the college choice process for many of the participants.

Factors Related to Paying for College

The financial aspect of higher education also emerged as an important factor for the participants. Participants shared that they were influenced by "in-state tuition" and "what scholarships I can get in different areas." Adam shared, *"I want to find the*

cheapest way to go. I don't want to be in debt going through. I feel like there are so many people that say 'oh I can get these student loans and it will all be good', but you still have to pay for them later and that gets a lot of people in trouble. I want to, hopefully, be able to go through without any debt, which I should be able to, but I want to find the best options for me."

Mandi also reflected the importance of cost in her statement, *"Um, well price kind of has to do with some of* [choosing a college]*, just because out-of-state prices are more expensive than in-state."* Like Mandi and Adam, many of the participants indicated they were considering factors related to paying for college when choosing what college they would attend.

Campus Environment

Of all the factors discussed, participants in this study spent the most time talking about campus environment. The category, campus environment, is comprised of five subcategories including prior campus experience, friendly people, clubs and activities, size of the institution and atmosphere.

Prior Campus Experience

Participants in this study reflected the importance of campus atmosphere in their college choice process. They conveyed a sense that the familiarity of having been on campus provided a sense of comfort in knowing what to expect. Mandi was making her first visit to campus the day of the interview, she shared why being on campus was valuable to her, *"Since I'm out of state, I'm not really sure how everything works, which I know is kind of similar to everywhere else. But I just wanted to get a feel for how everything was."* These statements from Mandi explaining why prior campus experience was important to her, supports other participants' statements of familiarity. Elizabeth shared "Decent environment, I mean I'm sort of used to the environment anyway" in the same spirit of wanting to have a sense of what to expect. Lance and Jane also referenced prior campus experiences.

Friendly People

"Friendly people" at the institution was another college choice factor identified by participants. All the participants shared a common sentiment: they wanted to attend an institution where "everybody is friendly." According to participant Hallie, friendly people was an important factor in feeling welcome at in institution. *"I'm just a big friendly person, I really like it when everyone is friendly and welcoming. I've been to colleges that aren't and it definitely shows. But at some colleges they've been like 'hi how are you'*

and just random people will be like, "hi, can I help you?" and it's really great to be able to feel welcome." Similarly, Lance shared, *"Something that is really big for me is the people. How the people accept you – how comfortable you feel. I feel extremely comfortable in both Stillwater and Manhattan, so that is the big thing for me."* Nick seemed to succinctly sum up the thoughts of the participants with his comment, "The people have to be friendly, that is what I like."

Clubs and Activities

The clubs and activities available for students were a factor that many of the participants considered in their college choice process. Some participants had ideas of specific groups or activities in which they wanted to participate, others were more general. Nick shared, *"I want to join intramural sports. I played lacrosse in high school so I want to do that here, probably. I'm thinking of going into AGR or FarmHouse because they are ag fraternities. My first year I'd probably go into a dorm, there might be like a fishing club or hunting club. I like those things, so I'll definitely join some clubs to get to meet people."* Other participants mentioned interests in "greek life", "being involved", and "campus activities". Rheba shared, *"I like all the different clubs and stuff, they have like so many clubs it's not hard to find one."* Travis shared, *"I think it'd be cool to get involved in campus activities and be around people a lot and not feel alone, because I'm* [from] *out of state."* For many of the participants clubs and activities were an important component to their choice of institution.

Size of the Institution

Size of the institution, both in terms of student population and physical size, was considered an important factor to the participants. Adam shared, *"I just want to see how many kids are on campus. I'm from a very small town and I just want to see basically what the faculty to student ratio is and if it has kind of a small town feel to it because I just want to have a small town feel and personal experience."* Similarly, Nick shared, *"Also, size. K-State is like the perfect size. Lawrence is a lot bigger and I don't like that. This seems like it is a lot smaller and there is not as many people, it seems a lot smaller. I like where Manhattan is located, not in the city but rural a little bit."*

Not all the participants were looking for a small town environment, Hallie shared, *"Mostly like a friendly atmosphere, I like a big campus, but not so big it feels like 'oh my goodness I'm overwhelmed,' ya know. And I would also like to have the smaller classes like one on one with like the professors and*

stuff." Taking yet another approach on size, Mandi shared, *"Um, kinda, well the college kind of needs to be close together, like not super far. Like things can't be miles apart because that would be hard because I don't really have transportation to get to those places."* Although expressed in different ways and in varying opinions, the size of the institution was an important factor for many of the participants.

Atmosphere

Overall "atmosphere" of the college or institution was a factor many of the participants discussed as being important. The most common sentiment shared was "how comfortable I feel" and "feeling like I belong." Travis shared, *"Um, feeling like I belong. Going out of state like this I'm 8 to 10 hours away from my family so I kind of have to feel good about being here. Biggest three* [factors] *are program of study, financial aid and sense of home, and of those three sense of home is the most important."* Brittany said, *"I wanted to have good campus life and great classes, fun classes, small sizes where the teacher gets to know you and you can learn great stuff from them. Good campus life, being able to just talk to people and have fun in the dorms, it's not just typical boring routine stuff in that every day."* Lance shared, *"The number one factor is where I'm most comfortable at.* [If] *I'm not comfortable at the school I'm not going to do near as well. I'm not going to enjoy my college experience at all. So probably the number one thing for me is how comfortable it is for me and how much fun I'm having. So really, if the school fits my personality and the town fits my personality that is probably where I will end up."* One participant referred to atmosphere as the "x factor," and the sentiment of the gut reaction to how they personally related to the overall atmosphere was shared among many of the participants.

Summary

This qualitative study sought to identify college choice factors as experienced and expressed by prospective students in the midst of the search phase in a college of agriculture. This study did not make attempts to generalize the results outside the population, however, implications for recruitment can be drawn with caution. The findings of this study are consistent with the literature base in finding that college choice factors are highly specific to the individual; no two participants having the exact same expectations for their future college or university (Bateman and Hossler, 1996; Hossler and Gallagher, 1987; Urbanski, 2000). Despite the unique set of characteristics each

participant shared, multiple commonalities were found among them.

In describing what college choice factors are important to them, participants of this study regarded three overarching and overlapping themes as important: institutional characteristics, participant background and personal impression. Efforts to maximize these areas can be made during the recruitment process with an emphasis on listening and speaking to the personal experience of the prospective student.

Institutional factors included programs offered, facilities, extracurricular opportunities and other experiences and services provided, organized or supported on the university, college or departmental level. Examples of institutional characteristics were shared by the participants when discussing specific programs and majors, clubs and organizations, etc. Other institutional characteristics, such as campus environment, are more abstract in nature. Campus environment is a broad concept that in this study encompassed prior campus experience, friendly people, clubs and activities, size of the institution and atmosphere. Although campus environment certainly contains a degree of personal interpretation, many factors stem from the institution or college level. Though none of the institutional factors can likely be drastically altered in any given direction overnight, the college and university certainly has the means to affect the overall culture of their institution and the factors discussed that students consider important. Students in this study highlighted the impact of university, college and department representatives they meet with and the interpreted personable/friendly nature of that interaction. Data gathered in this study suggest the university, etc. should continue to feature institutional factors in personal interactions, promotional materials, visits to campus, etc., focusing on accolades of specific majors and programs of study. Additionally, developing new means of highlighting the identified institutional factors and making them more visible to prospective students would target factors participants in this study deemed important.

Participant background primarily describes students' previous interactions with the university's campus, college, faculty, students, etc., either first hand or through family and friends. Institutions should emphasize events or activities that promote family experiences and participant interactions with the university, colleges and departments. Events held on campus or hosted by the university, which seek to create interactions with prospective students, build a connection between students and the institution.

Although "personal impression" is an abstract concept consisting of a student's personal impression and attitude toward an institution based upon experiences, recommendations, observations, etc., study participants gave indications that it is one of the most important factors they are considering when selecting a university. Maximizing impact on personal impression is difficult because each student may interpret and reflect upon common experiences differently. The participants in the study, however, indicated a personable and friendly demeanor may have the largest impact. Institutions should work to promote a university/college/department culture of listening and responding in a respectful, friendly way, in addition to promoting a welcoming, friendly and fun campus environment through both words and actions. As study participants indicated, prospective students notice not only their personally scheduled interactions, but the overall atmosphere of a campus as well.

Future research opportunities in college choice are abundant. Conducting similar studies with students who visited a given institution, but who ultimately enrolled at another university may yield important findings. Follow-up investigations to studies such as this have the potential to follow participants from one phase of college choice to another, evaluating changes and consistencies. College choice factors described as being important by participants, such as "friendly people," have the potential to themselves be studied and analyzed for what components, characteristics, etc, they consist of. Future research may also compare responses of students' in predetermined demographic categories, i.e. children of parents with college degrees vs. first generation college-bound students. Replicating studies of past college choice research are also important as changes in society (technology, marketing, social networking, societal norms, etc) are likely to affect prospective students and their beliefs/opinions/expectations of higher education.

Literature Cited

Acker, J. C., W. W. Hughes and W. R. Fendley, Jr. 2004. Alabama bound: Identifying factors associated with secondary education students' choice of attending the University of Alabama

Bateman, M. and D. Hossler. 1996. Exploring the development of postsecondary education plans among african american and white students. College and University 72(1):2-9.

Creswell, John W. 2007. Qualitative inquiry & research design: Choosing among five approaches (2nd Ed.). Thousand Oaks, CA: Sage Publications

Crotty, M. 1998, 2003. The foundations of social research: Meaning and perspective in the research process. London; Thousand Oaks, CA: Sage Publications.

Denzin, N. K. 1978. The research act: A theoretical introduction to sociological methods. New York: McGraw-Hill

DesJardins, S.L., H. Dundar and D.D. Hendel. 1999. Modeling the college application decision process in a land-grant university. Economics of Education Review 18(1):117-132.

Harris, M.S. 2009. Message in a bottle: University advertising during bowl games. Innovative Higher Education 33(5): 285-296.

Hartley, M., and C.C. Morphew. 2008. What's being sold and to what end? A content analysis of college viewbooks. Jour. of Higher Education 79(6):671-691.

Hossler, D. and K.S. Gallagher. 1987. Studying student college choice: A three-phase model and the implications for policymakers. College and University 62(3):207-221.

Jick, Todd D. 1979. Mixing qualitative and quantitative methods: Triagulation in action. Administrative Science Quarterly 24(4):602-611.

Kinzie, J., M. Palmer, J. Hayek, D. Hossler, S.A. Jacob and H. Cummings. 2004. Fifty years of college choice: Social, political and institutional influences on the decision-making process. New Agenda Series. Volume 5, Number 3

Maringe, F. 2006. University and course choice: Implications for positioning, recruitment and marketing. International Jour. of Educational Management 20(6):466-479.

Mooney, C. 2007. Choosing a college: Student voices. Chronicle of Higher Education 53(34):B24.

Nafukho, F.M. and F.M. Burnett. 2002 College Choice: The state of marketing and effective student recruitment strategies, in T.M. Egan and S.A. Lynham (eds.) Referred conference. Proceedings of the academy of human resource development Bowling Green, OH: Academy of Human Resource Development, pp. 788–795.

Pryor, J.H., S. Hurtado, L. DeAngelo, J. Sharkness, L.C. Romero, W.S. Korn and S. Tran. 2008. The American freshman: National norms for fall 2008. Los Angeles: Higher Education Research Institute, UCLA.

Rosen, D.E., J.M. Curran and T.B. Greenlee. 1998. College choice in a brand elimination framework: The high school student's perspective. Jour. of Marketing for Higher Education 8(3):73-92.

Urbanski, R.A. 2000. Factors influencing student college choice at a northeastern Minnesota tribal college.

(University of Minnesota), Report: ED463809. 186p. (Level 1 - Available online, if indexed January 1993 onward)

U.S. Department of Education, National Center for Education Statistics. (2009), Education Directory, Colleges and Universities, Integrated Postsecondary Education Data System, "Institutional Characteristics Survey"(IPEDS-IC:86-99), and Fall 2000 through Fall 2008. (http://nces.ed.gov/programs/digest/d09/tables/dt09_265.asp) (December 1, 2010)

U.S. Department of Education, National Center for Education Statistics. 2009. {American College Testing Program. unpublished tabulations, derived from statistics collected by the Census Bureau, U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS] (http://nces.ed.gov/programs/digest/d09/tables/dt09_200.asp?referrer=list) (December 1, 2010)

To submit a manuscript to the NACTA Journal, go to this website: nacta.expressacademic.org/login.php

NACTA

north american colleges and teachers of agriculture

connect | develop | achieve

The Effects of an Agricultural Communications Workshop on Self-Efficacy and Career Interest: A Comparison between Agriculture and Non-Agriculture Students

Quisto Settle[1]
University of Florida
Gainesville, FL

David L. Doerfert[2], Erica Irlbeck[3], Cindy Akers[2] and Scott Burris[4]
Texas Tech University
Lubbock, TX

Gary Wingenbach[2] and Tracy Rutherford[4]
Texas A&M University
College Station, TX

Abstract

The purpose of this study was to assess the effects of a one-week workshop on urban agriculture and non-agriculture students' self-efficacy and career interest related to agricultural communications. Non-agriculture students experienced increases in self-efficacy for agricultural communications tasks, self-efficacy toward overcoming obstacles for pursuing a degree in agricultural communications and interest in agricultural communications careers. Agriculture students decreased in all three constructs. The differences in the changes between agriculture students and non-agriculture students were statistically significant for both self-efficacy constructs but not for career interest. Based on the results, similar programs should focus efforts on non-agriculture students to expand the recruitment base for colleges of agriculture. Efforts should continue to increase urban agriculture programs to provide more long-term exposure to career opportunities in agriculture and natural resources.

Introduction

Recruiting

Higher education degrees in agriculture are not keeping pace with growth in degrees overall. When considering the number of associate's and bachelor's degrees awarded in agriculture and natural resources, the number declined slightly from 29,949 for 1997-1998 to 29,851 (-0.003%) for 2007-2008, while there was an growth of 570,272 (32.7%) in associate's and bachelor's degrees awarded overall (U.S. Department of Education, 2010). This decline is expected to continue according to estimates. The number of graduates of colleges of agriculture is expected to decline from an estimated 32,325 annually between 2005 and 2010 (Goecker et al., 2005) to an estimated 29,300 annually between 2010 and 2015 (Goecker et al., 2010). The needs of the agriculture and natural resources industry is increasingly being met by graduates without agriculture and natural resources degrees (Goecker et al., 2005; Goecker et al., 2010).

This lack of growth indicates a need for better recruiting practices. Urban populations are receiv-

ing much of the attention for improving recruiting practices in part because the United States is becoming increasingly urbanized (Department of Economics and Social Affairs Population Division, 2002). Promoting agriculture as a whole is not enough. Research indicates that recruiting practices are more effective when specific interests are targeted, such as agricultural communications. Lingenfelter and Beierlein (2006) found that interest in one area of agriculture is unrelated to interest in other areas of agriculture (i.e., interest in plant sciences would not be related to animal sciences). In addition to recruiting for specific career interests, it is also necessary to make individuals aware of their post-secondary choices. Students who are unaware of academic programs, which could be a good fit for them, may eliminate them from their options for higher education (Hossler and Gallagher, 1987).

Conceptual Framework

The college-decision web by Settle et al. (2008) that describes how students choose universities and majors serves as the conceptual framework for the study (Figure 1). That framework is based on two models: Hossler and Gallagher's (1987) three-phase model of student college choice and Chapman's model of student college choice (1981). Chapman's (1981) model explored how student characteristics and external influences affected the college-decision process. In Chapman's model, student characteristics were deemed more important in the college's choice of the student, not the student's choice of the college. An example would be student ability level. The factors affecting student choice were the external influences: significant persons (e.g., parents and teachers), fixed college characteristics (e.g., location) and university communication with students (e.g., campus visits and recruitment materials). Hossler and Gallagher's (1987) model broke the college-decision process into three steps: predisposition to attend college, the search process where the student and the college are actively seeking out information about each other and when the student evaluates their choices and picks a university. Combining the two frameworks, Settle et al. (2008) sought to explain the factors involved in

Figure 1. College-decision web for the student college-decision process by Settle et al. (2008).
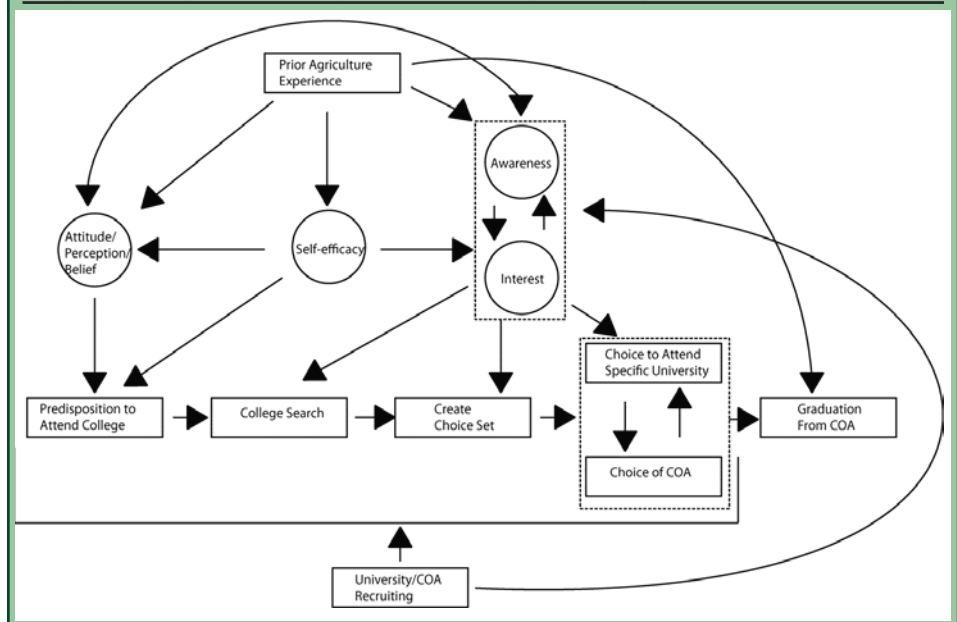
choosing a college and major, as well as when those factors affected the decision process. Information from relevant literature was also used to complete the model. The factors in the model were prior agriculture experience, attitude/perceptions/belief, self-efficacy, interest, awareness and university recruiting practices. The process consisted of predisposition to attend college, the college search, creation of college choice set, choice of university and/or college and graduation from college. This study addressed self-efficacy and interest, including how experience affected interest and self-efficacy in the Settle et al. (2008) model.

Self-Efficacy and Career Interest

Self-efficacy is an individual's belief in their ability to accomplish a task. Self-efficacy affects behavior *"by its impact on… goals and aspirations, outcome expectations, affective proclivities and perception of impediments and opportunities in the social environment"* (Bandura, 2006, p. 309). As for interest, Lynch (2001) found that personal decision was the most influential factor affecting students' decision to enroll in college agriculture programs. Swanson and Fouad (1999) stated that individuals who are helping students make the transition from school to work *"need to help students develop a sense of their own skills, interests and values as they make vocational choices"* (p. 341), illustrating the importance of self-efficacy and career interest.

Delving further into self-efficacy, though Bandura (2006) stated that *"the efficacy belief system is not a global trait but a differentiated set of self-beliefs linked to distinct realms of functioning"* (p. 307), he later stated *"behavior is better predicted by people's*

beliefs in their capabilities to do whatever is needed to succeed than by their beliefs in only one aspect of self-efficacy relevant to the domain" (p. 310). Although self-efficacy as a whole consists of these individual self-efficacies toward specific tasks, its ability to predict behavior is best understood by understanding overall self-efficacy for the individual. Self-efficacy can be further broken down to three dimensions: magnitude, strength and generalizability (Compeau and Higgins, 1995). Magnitude is the level of task difficulty the person believes they can accomplish, strength is the difficulty to change a person's self-efficacy and generalizability is the range of self-efficacy relation to a specific task to a wider scope of tasks.

For career interest, one recurring topic is the notion that students need to be made aware of the variety of careers that are available. Krumboltz and Worthington (1999) suggested that rather than having students rely on their current interests and capabilities, students should expand their career interests and capabilities. Students *"need to be asked 'What are you curious about?' They need to practice exploring their own curiosity"* (Krumboltz and Worthington, 1999, p. 318). Specific to agriculture, Boumtje and Haase-Wittler (2007) stated that agriculture needs to be promoted in terms of the variety of careers available so students are making career decisions "based upon their interest and not those of others" (p. 352). Savickas (1999) reported that students who are aware of the choices and necessary planning when searching for a career transitioned better into a career than those who are not aware.

Understanding self-efficacy and interest in a vacuum will not suffice. The constructs are related. As self-efficacy relates to career interest, Degenhart et al. (2006) found that improvement in self-efficacy toward careers improved students' interests in the careers, and, conversely, decreases in self-efficacy toward the careers led to decreased interest in the careers. Similarly, Esters and Knobloch (2007) found that *"self-efficacy and outcome expectations were strong predictors of interest and intentions to pursue careers in agriculture"* (p. 729) for students of a rural Korean agricultural magnet school. Interest can affect ability because individuals will self-select experiences based on interests (Roberts et al., 2003; Schooler, 2001), which could limit self-efficacy growth in those areas. The effects of self-selection become more stable in adulthood because adults have more control over what environment they are in than children and teenagers do (Ickes et al., 1997; Scarr, 1996).

The Effects of an Agricultural Experience

Experience is an area that the Hossler and Gallagher (1987) and Chapman (1981) models do not readily account for but is shown to affect college and career decisions in other studies. The experiences relevant to this study are structured educational experience in agriculture, be it school-based agricultural education, 4-H, or other educational programs related to agriculture.

Enrollment in secondary agriculture programs has been linked to enrollment in post-secondary agriculture programs. Boumtje and Haase-Wittler (2007) found that the highest barrier for not enrolling in agriculture majors was not enrolling in high school agriculture classes. Similarly, Wildman and Torres (2001) found that taking agriculture courses and participating in other agriculture activities, such as 4-H and FFA, were two of the most influential experiences on the decision to pursue a major in agriculture. These experiences not only relate to the initial post-secondary enrollment decision but also to the decision to complete an agricultural degree. Dyer et al. (1996) reported only 52.9% of those who did not participate in high school agriculture planned to graduate from the college of agriculture, while 94.9% of those who had participated in high school agriculture programs planned to graduate from the college of agriculture.

While high school agriculture programs can be an effective way of introducing students to agriculture, other means of recruiting secondary students need to be explored. Russell (1993) recommended that colleges of agriculture take a more active role in this process of introducing students to opportunities in agriculture. Wiley et al. (1997) assessed results of participating in a pre-college workshop relating to food and agricultural sciences. Participants of the program experienced positive attitudinal gains in relation to agriculture. These gains remained one year after the program, indicating the possible endurance of such intervention activities.

Purpose and Objectives

The Big City Big Country Road Show was designed to explore the potential of a workshop on recruiting urban students into colleges of agriculture as a joint effort between Texas Tech University, Texas A&M University and Howard College, funded by the USDA Higher Education Challenge Grant program. The purpose of this study was to determine if there were any differences between effects from a workshop for high school students from an agriculture program and students recruited from high schools without agriculture programs. More specifically, the objectives of this study were to

1. Compare agriculture and non-agriculture students' levels of self-efficacy and interest for pursuing agriculture careers before and after the workshop.

2. Compare changes in self-efficacy and career interest for agriculture and non-agriculture students.

Methods

A five-day workshop was designed to provide an overview of agriculture and agricultural communications. The workshop was divided into classroom and experiential learning sessions that provided content in risk and crisis communications, news writing, videography, web design and photography. The same instructors were used for each lesson when possible, but the risk and crisis communications lesson was taught by different instructors for two of the workshops. The experiential learning opportunities provided exposure to real-world applications of the classroom lesson content. These opportunities included students applying lesson content to create videos, pictures and websites.

The workshops were conducted in four U.S. cities in the summer of 2008. In two of the cities, high schools without agriculture programs were chosen. In these schools, science teachers assisted in recruiting their students to participate in the workshop. These teachers were asked to identify students who had an interest in communications. In the agriculture schools, teachers were asked to identify students in the agriculture program who had an interest in communications.

The population for this study included workshop participants in El Paso (Non-agriculture), Atlanta (Non-agriculture), Chicago (Agriculture) and San Antonio (Agriculture). El Paso had seven participants, Atlanta had six participants, Chicago had 11 participants and San Antonio had nine participants. The demographic data of the participants in each of the four workshops is summarized in Table 1.

Table 1. Gender, Ethnicity and High School Grade Level of Agricultural Communications Workshop Participants.				
	El Paso (n = 7)	Atlanta (n = 6)	Chicago (n = 11)	San Antonio (n = 9)
Gender				
Male	1	2	2	3
Female	6	4	9	6
Ethnicity				
White, non-Hispanic	0	0	3	0
Black, non-Hispanic	0	3	6	0
Hispanic	7	2	2	9
Native American	0	1	0	0
Grade level				
Freshman	0	0	0	1
Sophomore	5	1	5	3
Junior	2	4	6	5
Senior	0	1	0	0

The research used pre- and post-workshop questionnaires to gather data from the workshop participants regarding self-efficacy and interest toward agricultural communications careers. Research participants answered the pre-workshop questionnaire in each respective city prior to beginning the workshop lessons. The second questionnaire was given on the final day of the workshop after all of the lessons had occurred. The participants were assigned codes to log into the online questionnaires to allow responses before and after the workshop to be tracked.

The instrument for the study was adapted from the questionnaire used by Compeau and Higgins (1995) to assess computer self-efficacy and modified using Bandura's (2006) suggestions for constructing self-efficacy scales. Self-efficacy and interest were measured using 11-point Likert-type scales. For self-efficacy, the scale ranged from 0 = Cannot do it at all to 10 = Highly certain that I can do it. There were two self-efficacy sections for both the pre- and post-workshop questionnaires: one section assessed self-efficacy toward specific agricultural communications-related tasks (e.g., constructing a website) and the other section assessed self-efficacy in overcoming potential obstacles in pursuing a degree in agricultural communications (e.g., required basic knowledge of agriculture). The career interest section of the instrument measured interest toward a career in agricultural communications using a Likert-type scale that ranged from 0 = very strongly disagree to 10 = very strongly agree. A grand mean was calculated for each of the three constructs for every participant. Changes in both self-efficacy constructs and career interest were calculated using the grand means and the changes of the agriculture and non-agriculture students were compared using t-tests.

Reliability was assessed post hoc for the questionnaires by calculating Cronbach's alpha for each section of the questionnaires. The reliability scores for the pre-workshop questionnaire were 0.89 for self-efficacy toward specific tasks, 0.86 for self-efficacy toward overcoming degree-related obstacles, and 0.88 for career interests. The reliability scores for the post-workshop questionnaire were 0.86 for self-efficacy toward specific tasks, 0.84 for self-efficacy toward overcoming degree-related obstacles, and 0.83 for career interests. A reliability score of .80 is generally considered proficient (Norcini, 1999). The instrument was reviewed by faculty of the University of Florida for content and face validity.

The study was approved by Texas Tech University's institutional review board. All workshop participants were eligible to be subjects, but they were required to

have a parental consent form signed to participate in the research as well as signing an assent form themselves. Research participation was not required to participate in the workshop. There were no incentives provided to the subjects for participating in the research.

Results and Discussion

For changes in self-efficacy toward specific tasks, there were differences in responses between agriculture and non-agriculture students (Table 2). Agriculture students' self-efficacy toward tasks decreased (-0.94), while non-agriculture students' self-efficacy toward tasks increased (0.88). The difference between the changes in task self-efficacy was statistically significant (t = 2.70, df = 24, p = .01). Similar results also occurred for self-efficacy toward obstacles for completing a degree in agricultural communications (Table 3). Agriculture students decreased (-0.44) and non-agriculture students increased (0.60). The difference between the changes was also statistically significant (t = 2.30, df = 31, p = .03). For career interest (Table 4), agriculture students decreased slightly (-0.06), while non-agriculture students experienced an increase (1.01), but the difference between the changes in means was not statistically significant (t = 1.81, df = 26, p = .08).

Self-efficacy and interest are interrelated constructs that are important for career choice (Boumtje and Haase-Wittler, 2007; Degenhart et al., 2006; Esters

and Knobloch, 2007; Krumboltz and Worthington, 1999; Lynch, 2001; Swansou and Fouad, 1999). The results for non-agriculture students were in line with the findings of Wiley et al. (1997), but agriculture students were not. The results indicate that prior experience affected the program's ability to affect self-efficacy and career interest (Settle et al., 2008). Because agriculture students decreased on all three constructs and non-agriculture students increased on all three, these results indicate similar programs would have more success if they focused on non-agriculture students.

Another aspect of the results is the participants were exposed to different career options. With past work showing that students may have limited career interests based on awareness (Boumtje and Hasse-Wittler, 2007; Hossler and Gallagher, 1987; Krumboltz and Worthington, 1999), the increase in interest, particularly for non-agriculture students, indicates the possibility for workshops to expand students' career interests by exposing them to different career options.

Summary

Differences were found between effects from the workshop on agriculture students and non-agriculture students for self-efficacy and career interest toward agricultural communications. The results indicated that the workshop had positive effects on non-agriculture students for self-efficacy and career interest, but the results were not the same for agriculture students. Future programs of this nature should focus on students without agriculture backgrounds to optimize the effectiveness of the programs. Research should also be conducted to assess the long-term results of this program and similar programs in the future. Specifically, participants' post-secondary enrollment decisions and degree completion should be addressed. The research should also address long-term changes in attitudinal constructs similar to the Wiley et al. (1997) study.

The development of urban secondary agriculture programs should continue. Despite the results of this study, secondary agriculture programs and 4-H have already been documented and recommended as valuable sources of students for colleges of agriculture (Boumtje and Haase-Wittler, 2007; Dyer et al., 1996; Russell, 1993; Wildman and Torres, 2001). Urban agriculture programs have the ability to provide more experiences over a longer period of time that are more likely to be retained by students compared to short-term interventions, such as the workshop in

Table 2. Difference in changes in levels of self-efficacy toward agricultural communications tasks between agriculture and non-agriculture participants.

	Agriculture	Non-agriculture	t value
Pre-workshop self-efficacy toward tasks	7.85	7.47	
Post-workshop self-efficacy toward tasks	6.91	8.35	
Change	-0.94	0.88	2.70*

^{z}Self-efficacy was coded on a scale ranging from 0 = Cannot do it at all to 10 = Highly certain that I can do it.
*p<.05.

Table 3. Changes in levels of self-efficacy toward overcoming obstacles for pursuing a degree in agricultural communications between agriculture and non-agriculture participants.

	Agriculture	Non-agriculture	t value
Pre-workshop self-efficacy toward obstacles	7.24	7.93	
Post-workshop self-efficacy toward obstacles	6.80	8.53	
Change	-0.44	0.60	2.30*

^{z}Self-efficacy was coded on a scale ranging from 0 = Cannot do it at all to 10 = Highly certain that I can do it.
*p<.05.

Table 4. Changes in levels of interest for a career in agricultural communications between agriculture and non-agriculture participants.

	Agriculture	Non-agriculture	t value
Pre-workshop career interest	6.90	6.87	
Post-workshop career interest	6.84	7.88	
Change	-0.06	1.01	1.81

^{z}Career interest was coded on a scale ranging from 0 = very strongly disagree to 10 = very strongly agree.

this study. But until more of these permanent programs can be established, similar short-term interventions should continue to be developed and improved based on prior results to reach students who do not have access to permanent agricultural education programs.

There is not an easy solution and it will likely take multiple approaches to reach the ultimate goal of meeting the graduate needs of the agriculture and natural resources industry. Colleges of agriculture should continue to support short-term interventions, such as the one addressed in this study and urban agriculture programs to increase the number of urban students who pursue careers in agriculture to meet the agriculture and natural resources industry's employment needs (Goecker et al., 2010; U.S. Department of Education, 2010).

There are limitations due to the scope of the study. First, the results may only apply to this program. Second, because participants were not randomly selected, results may not apply beyond this sample to the students' schools and cities.

Literature Cited

Bandura, A. 2006. Guide for constructing self-efficacy scales. In: Pajeres, F. and T. Urdan (eds.). Self-efficacy beliefs of adolescents. Greenwich, CT: Information Age Publishing.

Boumtje, P. and P.S. Haase-Wittler. 2007. Factors affecting enrollment of minority students in agriculture majors at Southern Arkansas University. In: Proc. of 2007 CTE Research and Professional Development Conference 41:346-354.

Chapman, D.W. 1981. A model of student college choice. Jour. of Higher Education 52:490-505.

Compeau, D.R. and C.A. Higgins. 1995. Computer self-efficacy: Development of a measure and initial tests. MIS Quarterly 19:189-211.

Degenhart, S.H., G.J. Wingenbach, K.E. Dooley, J.R. Lindner, D.L. Mowen and L. Johnson. 2006. Middle school students' attitudes toward pursuing careers in science, technology, engineering, and math. NACTA Jour. 51(1):52-59.

Department of Economic and Social Affairs Population Division. 2002. World urbanization prospects: The 2001 revision. (http://www.un.org/esa/population/publications/wup2001/WUP2001_CH4.pdf). United Nations Publication Board. (March 9, 2012).

Dyer, J.E., R. Lacey and E.W. Osborne. 1996. Attitudes of University of Illinois College of Agriculture freshmen toward agriculture. Jour. of Agricultural Education 37(3):33-42.

Esters, L.T. and N. Knobloch. (2007). Rural Korean students' level of interest and intentions to pursue careers in agriculture. In Proc. of 2007 American Association of Agricultural Education National Research Conference 34:728-730.

Goecker, A.D., J.L. Gilmore, E. Smith and P.G. Smith. 2005. Employment opportunities for college graduates in the U.S. food, agricultural, and natural resources system. (http://www.csrees.usda.gov/newsroom/news/2005news/USDA_05_Report2.pdf). Purdue University. (March 8, 2012).

Goecker, A.D., P.G. Smith, E. Smith and R. Goetz. 2010. Employment opportunities for college graduates in food, renewable energy, and the environment: United States, 2010-2015. (http://www.agriculture.purdue.edu/usda/USDAEmployOp2010.pdf). Purdue University. (March 8, 2012).

Hossler, D. and K.S. Gallagher. 1987. Studying student college choice: A three-phase model and the implications for policymakers. College and University 62(3):207-221.

Ickes, W., M. Synder and S. Garcia. 1997. Personality influences on the choice of situations. In: Hogan, R., J. Johnson, and S. Briggs (eds.). Handbook of personality psychology. San Diego, CA: Academic Press.

Krumboltz, J.D. and R.L. Worthington. 1999. The school-to-work transition from a learning theory perspective. The Career Development Quarterly 47:312-325.

Lingenfelter, K.M. and J.G. Beierlein. 2006. Recruitment into the college of agricultural sciences: factors related to student major choices. In: Proc. of 2006 American Association of Agricultural Education National Research Conference, 33.

Lynch, T.L. 2001. Factors influencing the enrollment of minority students in agricultural science programs at Virginia Tech. PhD Diss., Dept. of Teaching and Learning , Virginia Polytechnic Institute and State Univ., 226 War Memorial Hall, Blacksburg, VA. 24061.

Norcini, J.J., Jr. 1999. Standards and reliability in evaluation: When rules of thumb don't apply. Academic Medicine 74(10):1088-1090.

Roberts, B.W., A. Caspi and T.E. Moffitt. 2003. Work experiences and personality development in young adulthood. Jour. of Personality and Social Psychology 84(3):582-593.

Russell, E.B. 1993. Attracting youth to agriculture. Jour. of Extension 31(4).

Savickas, M.L. 1999. The transition from school to work: A developmental perspective. The Career Development Quarterly 47:326-336.

Scarr, S. 1996. How people make their own environ-
ments: Implications for parents and policy makers.
Psychology, Public Policy, and Law 2(2):204-228

Schooler, C. 2001. The intellectual effects of the
demands of the work environment. In: Sternberg,
R.J. and E.L. Grigorenko (eds.). Environmental
effects on cognitive abilities, Mahwah, NJ:
Lawrence Erlbaum Associates, Publishers.

Settle, Q., D.L. Doerfert and C. Akers. 2008. College-
decision web for prospective college of agriculture
students. In: Proc. of 2008 American Association
of Agricultural Education National Research
Conference 35:1125-1128.

Swanson, J.L. and N.A. Fouad. 1999. Applying
theories of person-environment fit to the transition
from school to work. The Career Development
Quarterly 47:337-347.

U.S. Department of Education, National Center for Ed-
ucation Statistics. 2010. The Condition of Educa-
tion 2010 (http://nces.ed.gov/pubs2010/2010028.
pdf). National Center for Education Statistics.
(March 8, 2012).

Wildman, M. and R.M. Torres. 2001. Factors identified
when selecting a major in agriculture. Jour. of
Agricultural Education 42(2):46-55.

Wiley, Z.Z., B.E. Bowen, C.F. Bowen and A.L.
Heinsohn. 1997. Attitude formulation of ethnic
minority students toward the food and agricultural
sciences. Jour. of Agricultural Education 38(2):21-
29.

Mark Your Calendars Now!
June 25 - 29
2013 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

Engaging Students in Service Learning through Collaboration with Extension: A Recipe for Success with Community Partners

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

Tammy J. Stephenson[1], Laura Stephenson[2] and Lindsey Mayes[3]
University of Kentucky
Lexington, KY

Abstract

Service learning (SL) is a well-recognized teaching approach that integrates meaningful community service with classroom learning. Plate It Up! Kentucky Proud is a successful SL activity that connects student and faculty expertise with Family & Consumer Science (FCS) Extension agent programming. Students develop and test quality, nutritionally-sound, recipes using locally grown fruits and vegetables. Student interest in the project and knowledge of FCS Extension were significantly enhanced during the course of the semester. As well, 99% of students would recommend this project to a peer. On a scale of 1-7 (7=incredibly important), students rank the importance of real-life applications in coursework as 6.31 ± 0.97; 35% of students would take a section of a course just because it incorporates such applications. Students developed their nutrition knowledge, team building skills and communication skills through the project. Agents also positively reflected on this collaboration with 100% of surveyed agents recommending the project to their colleagues. On a scale of 1-7 (7=incredibly interested), agents ranked their overall interest as 6.40 ± 0.52. This successful collaboration serves as an example of students, faculty and administrators engaging with well-established community partners to have a significant impact on community health and student learning.

Introduction

Experiential learning is defined as occurring when students participate in a contrived "real life" activity, reflect upon that activity, use their critical analysis skills to derive useful knowledge, meaning and insight from the experience and then incorporate their new understandings into their daily lives (Bohn and Schmidt, 2008). The meta-cognitive skills that students utilize while participating in experiential learning activities enable them to assess their true level of understanding and mastery for the subject matter. Service learning is a well-recognized form of experiential learning in higher education that emphasizes relating a community service activity to course or program learning outcomes through a mutually-beneficial activity and student reflection opportunities (Anderson et al., 2011; Querry and Smith, 2004). Service learning activities promote student learning and skill sets, enhance academic curriculum and foster strong relationships between campus and community (McDaniel, 1994; Ross, 2012).

Service learning projects have a long history of being particularly valuable in agricultural programs, including human nutrition and dietetics. There is an increased interest in expanding SL activities for these students as a means to address health disparities within communities (Cene et al., 2009; Marcus et al., 2011). Dietetic students report SL allows for greater learning by integrating classroom knowledge with real-life experiences (Kim et al., 2003). Service learning also promotes critical thinking skills, leadership skills and civic and social responsibility (Bailey et al., 2002). In an analysis of SL impact in a large enrollment introductory nutrition class it was found that students perceived they learned the information better as a result of the experiential learning activities and felt more confident in their ability to apply the knowledge to real-world situations. Senior dietetic students in a

[1]PhD, Senior Lecturer, Department of Nutrition & Food Science
[2]PhD, Assistant Director for Family & Consumer Sciences Field Programs
[3]BS, Graduate Teaching/Research Assistant, Department of Nutrition & Food Science

Medical Nutrition Therapy course worked in groups to develop interactive, educational modules on nutrition-related chronic diseases (e.g. heart disease, obesity) for training of Cooperative Extension Service agents in Louisiana. The majority of students felt the project promoted their professional development through cognitive and personal growth while also having a societal impact (Holston and O'Neil, 2008).

Service learning activities allow students to experience "real-world issues" in an applied classroom setting (Bonnette, 2006). In nursing students, undergraduate SL activities have been found to enhance the students' academic, social and personal development at the same time as building partnerships with community organizations (Bassi, 2011). Service learning improves human nutrition student's professional skills and allows them to have a greater appreciation for the role of nutrition professionals in community (Poehlitz et al., 2006). In health professions, integrating community based public health activities into the curriculum enhances student involvement in community service and fosters professional relationships between students, faculty and professional partners (Anderson et al., 2011; Gazsi and Oriel, 2010).

Bosma et al. (2010) determined that communication, shared decision making, shared resources, expertise and credibility, sufficient time to develop and maintain relationships, being present, flexibility and recognition of other partners' priorities were essential to a successful partnership. Cooperative Extension FCS agents serve as an outreach arm of land-grant universities through community educational programs in consumer economics, food and nutrition and family sciences. While integrated within the land-grant college, programming rarely involves college students. However, by involving college students in community outreach opportunities through Extension a University can be truly engaged. An Extension-centered SL activity exploits the expertise of students, faculty, administrators and Extension professionals. Key reasons to consider Extension in SL activities are (1) agents have practical experience, (2) existing programs exist as models for success and (3) county-level contacts are already in place working with community groups (Morris et al., 2002). Extension faculty and professionals are well-recognized in their communities as trusted sources of research-based information (Mehta et al., 2003). Faculty developing SL activities benefit from the well-established county and state-level Extension infrastructure that is already in place. Extension collaboration with students and faculty on campus allows for innovative and timely delivery of health education programming. The programming can be developed at little or no cost to local offices with students providing energy and mobilization for the project (Condo and Martin, 2002).

The objective of this project was to assess the student and agent perceived value of an Extension-based SL activity in an upper-level human nutrition and dietetics course at the University of Kentucky. This information will provide university instructors with student and community partner input to develop innovative, collaborative and relevant SL projects.

Methods

Course Description

The first author teaches the course "Experimental Foods" to junior and senior level dietetic and human nutrition students at the University of Kentucky (Lexington, Kentucky). Dietetics and Human Nutrition are high-enrollment majors at the University, enrolling over 500 students between the two majors. Experimental Foods is taught both fall and spring semesters with limited enrollment due to laboratory space restrictions. A total of 66 students were enrolled in the course during the Fall 2010 and Spring 2011 semesters. Experimental Foods teaches students about *"chemical and physical properties of food and the changes resulting from processing and preparation with experimental study of variations in ingredients and preparation methods on food quality."* (UK 2011) The course is taught with a two-day per week lecture and one three-hour laboratory session per week with 20-24 students in each lab section. The pre-requisite for the course is "Principles of Food Preparation", a course that prepares students in food preparation techniques through both theory and practical laboratory experience. The University of Kentucky houses a state-of-the art commercial-grade kitchen for all laboratory courses.

Service-Learning Component: Plate It Up! Kentucky Proud

Plate It Up! Kentucky Proud is a collaborative effort between FCS Extension agents, College of Agriculture administrators and human nutrition students and faculty. The project is fully funded by the Kentucky Department of Agriculture with three primary objectives:

1. Increase consumer purchase and preparation of Kentucky-grown produce.

2. Improve health of Kentuckians by increasing consumption of fruits and vegetables in healthy recipes.

3. Develop a bank of University of Kentucky copyrighted recipes for FCS agent use in county programming.

Plate It Up! Kentucky Proud is an ongoing project initiated in Fall, 2009. Dietetic and human nutrition students in Experimental Foods were charged with the task of developing healthy recipes using Kentucky-grown commodities, primarily fruits and vegetables. Prior to the semester, FCS Extension agents provided the instructor with a list of over 50 recipes for possible modification. The instructor reviewed the recipes to determine whether they were appropriate for the scope of the class and 3-hour duration of the laboratory session. Those recipes deemed eligible were then collated in a notebook for student selection. Students worked with a lab partner or partners and self-selected one of the approved recipes. They evaluated the recipe for ways in which it could be improved from a nutritional, food preparation, or cost-saving perspective. Students were charged with the task of using locally-grown commodities and ingredients that are readily available in most Kentucky communities, both rural and metro. Course lectures, activities and assignments were designed to support the recipe development process. An FCS Extension agent on the Plate It Up! Kentucky Proud committee was a guest lecturer, reviewing the program goals and process, as well as answering student questions. Students worked in teams to research Kentucky grown commodities for presentation to the class. An initial recipe modification proposal was reviewed by the instructor, suggestions were made and a revised plan with materials requirements was developed. Once finalized, recipes were tested over the course of three weeks with changes made weekly to improve product quality. During each laboratory session the students prepared both the original and modified recipes with subjective and objective testing completed for each. On the final day of recipe testing, FCS Extension agents served as taste-testers. Agents came to the laboratory session early to interact with students and discuss recipe modifications. Then, students presented the original and modified versions of their recipe for agent evaluation. The agents met in the two weeks following the recipe testing period to discuss and rank the student recipes. Recipes that met the taste, cost and quality criteria of the agents were then re-tested by FCS Extension agents. The agents developed professional recipe cards, media scripts, video recordings and teaching materials for each recipe. Following the agent taste-testing session, students completed the nutritional analysis of both their original and modified recipe; modified recipes with nutrition information were provided to the agents. With their lab partner(s), students developed a scientific paper describing their recipe modification, the theory to support that modification and subjective and objective testing results. The final stage of the project was student self-reflection.

As of the second year of the project, 100 recipes have been developed and tested by students over the course of six semesters. Of these recipes, 34 have been fully developed and printed as recipe cards and 89 have been included in the online searchable recipe database (www.kyproud.gov). Over one million recipe cards have been distributed by FCS agents in all 120 counties of Kentucky. The Plate It Up! Kentucky Proud project was selected as the spotlight program at the Kentucky State Fair Commodity Breakfast in August 2011.

Student and Agent Evaluation

While a successful project in terms of outcomes and community impact, the investigators wanted to assess the project from a student and agent SL and collaboration perspective. This study was deemed exempt by the University of Kentucky Institutional Review Board.

Student perception of the SL project was assessed in a two-page written survey at the end of the Fall 2010 and Spring 2011 semesters. Anonymous surveys were distributed to all students enrolled in the Experimental Foods course. Sixty-six surveys were completed and returned. The instructor-developed survey evaluated students' perceptions of the SL project and FCS Extension collaboration. The quantitative component of the survey assessed student interest in the SL project, importance of interacting with agents, value of SL in coursework, usefulness of working in a group and skill set enhanced through the project. Qualitative questions evaluated knowledge gained from the interaction with FCS Extension and most and least favorite aspects of the SL project.

We assessed the value of this collaborative SL project from an Extension agent perspective in a two-page anonymous written survey presented to the 11 agents active on the Plate It Up! Kentucky Proud organizational committee. The instructor-developed survey sought both qualitative and quantitative agent input. The survey assessed agent years of experience, educational background, interest in the project, interest in collaborating with students and faculty, quality of student recipe development and presentation and project outcomes.

Results and Discussion

Student and community partner feedback is essential to effective and sustained SL projects. Reflection validates the activity, fosters critical thinking skills and allows for continuous modifications to the project (Holston and O'Neil, 2008). Results from both student and FCS Extension agent assessment are presented.

Student Assessment

Students provided primarily positive open-ended feedback on this SL project. A majority of students reported that they valued the "real-life" application of this project. They were both inspired and challenged by the realization that their recipes might become a part of the Plate It Up! Kentucky Proud brand. One student stated, *"The project was fun and educational at the same time. I learned how widespread the effects of our projects are on the community and what is important to include in a recipe."* Another student stated, *"This was a great application of nutrition skills."* These comments are consistent with those provided by the majority of students surveyed. When asked what the students liked least about the SL project their responses were consistently, "Having to write a scientific report" and "Taste testing recipes for three weeks in a row." Both of these are a requirement for the course itself and not SL project specific.

Ninety-nine percent of students would recommend this project to a peer (Table 1). These results are similar to other nutrition-related SL projects, including a student-led nutrition education program for children called Kids Eat Healthy. The students reported that the project was a rewarding and beneficial experience that made them feel a sense of community responsibility, allowed them to take responsibility as a healthcare provider and enhanced their ability to provide nutrition education to children (Falter et al., 2011). Similarly, dietetic students at Northern Illinois University reported increased self-confidence in implementing nutrition education and an appreciation that learning extended beyond the text and classroom following a health-promotion class SL activity (Henry and Ozier, 2009).

Using a Likert-like scale of 1-7 (7=incredibly interested), students were asked to rate their overall interest in the project and knowledge of FCS Extension at the beginning and end of the semester

Table 1. Results of student survey (n=66) on service learning collaboration in Plate It Up! Kentucky Proud.	
Survey Question	**Response**
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe project at the <u>beginning</u> of the semester?	Mean ± S.D: 5.11 ± 1.46
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe project at the <u>end</u> of the semester?	Mean ± S.D: 5.51 ± 1.20 *
On a scale of 1-7 (7=incredibly knowledgeable), how would you rate your knowledge of FCS Extension at the <u>beginning</u> of the semester?	Mean ± S.D: 2.32 ± 1.40
On a scale of 1-7 (7=incredibly knowledgeable), how would you rate your knowledge of FCS Extension at the <u>end</u> of the semester?	Mean ± S.D: 5.16 ± 1.11 **
On a scale of 1-7 (7=incredibly important), how important was interacting with FCS Extension agents for this project?	Mean ± S.D: 4.46 ± 1.54
On a scale of 1-7 (7=incredibly important), how important do you think real-life applications are in your college coursework?	Mean ± S.D: 6.31 ± 0.97
On a scale of 1-7 (7=incredibly important), how important was critical thinking in this project?	Mean ± S.D: 5.03 ± 1.04
If given a choice, would you take a section of a course just because it incorporates real-life applications?	Yes: 35%
How many of your other classes have involved real-life service learning activities?	4 or more classes: n= 6 3 classes: n= 8 2 classes: n=17 1 class: n=13 0 classes: n=22
Which of the following skills were enhanced through this project? *Check all that apply.*	Ingredient substitution knowledge: 95% Food preparation knowledge: 91% Use of taste-testing in product development: 91% Nutrient knowledge: 98% Team building: 84% Interpersonal communication skills: 86% Writing a scientific report: 82%
Would you recommend this project to a peer?	Yes: 99%

[1]Asterisks indicate statistically significant differences (**) for ($p<0.001$) and * for ($p<0.05$) between beginning and end of semester scores using paired t-test.

(Table 1). Both interest in the project and knowledge of FCS Extension were significantly enhanced ($p<0.05$ and $p<0.001$ respectively) during the course of the semester. This SL project brought higher visibility of Extension to the campus community. Similar to other's findings (Condo and Martin, 2002), students who previously had not heard of Extension learned the value of Extension as an educational resource.

On a scale of 1-7 (7=incredibly important) students rated the importance of real-life application in college coursework as a 6.31 ± 0.97 (Table 1). Thirty-five percent of the students would take a section of a course just because it incorporates real-life applications. Two-thirds of the students had taken one or more additional classes that incorporated SL.

From an instructional standpoint, a SL project is only of value in the classroom if it enhances and promotes learning. Key student learning outcomes were evaluated (Table 1) with the majority of students reporting an enhancement in skills through this SL project. Nutrient knowledge, quintessential to dietetic

Table 2. Student assessment of collaborating with peers and working in small groups (n=66).	
Score (Scale of 1-7 with 1=completely disagree and 7=completely agree)	
	Mean ± S.D.
The ability to collaborate with my peers will be necessary if I am to be successful as a student.	6.19 ± 1.16
I have a positive attitude about working with my peers.	6.11 ± 1.06
The ability to work with my peers is a valuable skill.	6.37 ± 0.92
In my career, I can be as successful working alone as working with others.	4.94 ± 2.07
Solving problems in a group is an effective way to learn.	6.07 ± 1.11
Group decisions are often better than individual decisions.	5.33 ± 1.48
Solving problems in groups leads to better decisions than solving problems alone.	5.38 ± 1.45

and human nutrition program success, was enhanced in 98% of participants. Ingredient substitution knowledge, food preparation knowledge, use of taste-testing in product development, team building skills, interpersonal communication skills and report writing skills were also developed. These findings support prior research at North Carolina State University where a diverse group of students engaged in a community food security SL experience (Chika et al., 2011). Students were engaged for three hours per week at a local food recovery program, recovering commodities from a farm and community garden program. In a post-project assessment, this multidisciplinary group of students had gained the ability to discuss the challenges of developing and implementing food security programs in the community.

Students worked with a one or two lab partner(s) on their recipe development. Students often resist small group work due to unequal distribution of work, different work styles and conflicting schedules (Hansen, 2006). These barriers to group work can be further exacerbated with large group sizes (Holston and O'Neil, 2008). We assessed student attitudes towards group collaborations (Table 2). On a Likert-scale of 1-7 (7=completely agree) students rated "The ability to work with my peers is a valuable skill" as a 6.37 ± 0.92. *"The ability to collaborate with my peers will be necessary if I am to be successful as a student"* (6.19 ± 1.16) and "I have a positive attitude about working with my peers" (6.11 ± 1.06) were also highly rated. Students recognized that they will not be as successful working alone as working with others. This realization is important for students who will be entering the healthcare profession where dietitians, physicians, physician assistants, nurses, pharmacists and therapists work together to treat patients as part of a "healthcare team".

Agent Assessment

Essential to the student, faculty, administrator and Extension collaboration are communication, project evaluation, sustainability, shared resources and positive climate (Borden and Perkins, 1999). Plate It Up! Kentucky Proud meets all of these criteria, with grant funding essential to the sustainability and development of the project. For a successful SL collaboration, the project experience should be mutually beneficial. Therefore, it is important to assess not only student, but also community partner opinion of the SL project.

Eleven FCS Extension agents on the Plate It Up! Kentucky Proud steering committee were surveyed in Fall 2010 in regards to their involvement in the project. One agent reported, "[The project] *is a great experience – wonderful to see the labs and to see the students in action. Great to see interest in newly discovered foods and recipes.*" According to a second agent, the project was an "Excellent experience to demonstrate the campus/extension partnership benefits."

On a 7-point scale (7=incredibly interested), agents had an average interest in the project of 6.40 ± 0.52 with all agents recommending the collaboration to their colleagues (Table 3). Copyrighted recipe development (6.30 ± 0.95) and agent participation in classroom recipe testing (6.00 ± 0.94) were both important to agents. Agents reported participating in the project to: interact with students (67%), engage with faculty and administrators on campus (50%), ensure quality control in recipes (82%), and interact with other FCS agents interested in the project (50%). These findings are comparable to those from a community nutrition SL activity at 14 community agency sites in Colorado. When surveyed at the end of the project, 64% of the community partners were "strongly satisfied" and 27% were "satisfied" with the general quality of the student's work. As well, 100%

Table 3. Results of Family & Consumer Science Extension Agent survey (n=11) on service learning collaboration in Plate It Up! Kentucky Proud.	
Survey Question	**Response**
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe development project?	Mean ± S.D: 6.40 ± 0.52
On a scale of 1-7 (7=incredibly important), how important do you think copyrighted recipe development is to FCS Extension?	Mean ± S.D: 6.30 ± 0.95
On a scale of 1-7 (7=incredibly important), how important is it for agents to participate in the classroom recipe testing?	Mean ± S.D: 6.00 ± 0.94
Why do you participate in the classroom recipe testing? (Check all that apply)	
% selecting each option	
To ensure quality control in recipes: 82%	
To interact with students: 67%	
To interact with other FCS agents interested in this project: 50%	
To engage with faculty and administrators on campus: 50%	
To learn more about the recipe testing process: 33%	
Do you see a benefit of this recipe project to FCS Extension programming?	Yes: 100%

of the community partners wished to partner with the class again in the future (Sifford and Cunningham-Sabo, 2009).

Family and Consumer Science Extension agents were a valuable resource to guide the students on the needs of their diverse communities as this project introduced many of the students to the needs of a culturally and economically diverse clientele. According to Amerson (2010), there is a need to develop and enhance cultural competence in healthcare workers in the United States. In Kentucky, median family income is $40,061, but median income by county ranges from $21,177 to $79,353 (U.S. Census Bureau, 2010). One-third of children in Kentucky live in single-parent homes. Student recipes had to meet the needs of this diverse clientele; students had to utilize ingredients that would be available in both rural and urban settings. The FCS Extension agents provided guidelines and support in the student efforts to ensure recipes were appropriate for a diverse population.

Summary

This SL activity was guided by a mutually beneficial collaboration between faculty, students, administrators and FCS Extension agents. The academic partners provided project management, oversight of student involvement and research expertise to facilitate project assessment. According to Caspers and Vlasses (2009), academic research partnerships create a culture and system to support community agencies and excellence in programming.

Despite anecdotal evidence of its value in higher education, not all faculty are convinced on the benefits of SL in the classroom. Common criticisms of SL include it is an untested method, waters down the curriculum, takes away valuable time from faculty and students and takes significant funding (Gaster, 2011). Contrary to these common beliefs, this SL project was rewarding and valued by all involved, including faculty and administrators. Course content and materials were enhanced through this SL activity, providing a venue to engage and motivate students. Indeed, securing long-term funding has been instrumental to the success of the project. This funding was secured after a two-year cookbook recipe modification project with a separate community organization. This unfunded project allowed for the instructor to revise the course to incorporate a major recipe modification activity and to develop an effective protocol for community partnerships and SL-centered learning in the classroom.

As the project moves forward, student and community partner input will continue to be integral to the project design. To further assess the depth of the students' learning and critical thinking, we will enhance the critical reflection component of the project through additional meaningful reflection activities, including weekly group discussions during the recipe testing phase of the project (Molee et al., 2010). Kessler and Burns-Whitmore (2011) recently reported that students benefit from a variety of reflection tools and that some students prefer one tool to reflect on self and another tool to reflect on community. They advise faculty to use creativity when developing reflection tools and that reflection can be drawing a picture, writing a song, scrapbooking, and panel discussion, not necessarily traditional, written journal entries. Future studies should continue to evaluate both student and community partner attitudes towards SL activities through meaningful and innovative reflection activities.

Literature Cited

Amerson, R. 2010. The impact of service-learning on cultural competence. Nursing Education Perspectives 31(1):18-22.

Anderson, L.S., M.O. Royster, N. Bailey and K. Reed. 2011. Integrating service-learning into an MPH curriculum for future public health practitioners: Strengthening community-campus partnerships. Jour. of Public Health Management Practice 17(4):324-327.

Bailey, P.A., D.R. Carpenter and P. Harrington. 2002. Theoretical foundations of service-learning in nursing education. Jour. of Nursing Education 41:433-77.

Bassi, S. 2011. Undergraduate nursing students' perceptions of service-learning through a school-based community project. Jour. of Extension 32(3):162-167.

Bohn, D. and K. Schmidt 2008. Implementing experiential learning activities in a large enrollment introductory food science and human nutrition course. Jour. of Food Science Education. 7:5-13.

Bonnette, R. 2006. Out of the classroom and into the community: Service learning reinforces classroom instruction. Technology Teacher 65(5):6.

Borden, L.M. and D.F. Perkins. 1999. Assessing your collaboration: A self-evaluation tool. Jour. of Extension 37(2).

Bosma, L.M., R.E. Sieving, A. Ericson, P. Russ, L. Cavender and M. Bonine. 2010. Elements for successful collaboration between K-8 school, community agency, and university partners: the lead peace partnership. Jour. of School Health 80(10):501-507.

Caspers, B. and F.R. Vlasses. 2009. Springboard to Research: A service and academic partnership. Nurse Leader August:30-34.

Cene, C.W., M.E. Peek and E. Jacobs 2009. Community-based teaching about health disparities: combining education, scholarship, and community service. Jour. of Generalist Internal Medicine 25:S130-5.

Chika, S., S. Ash, J. Grossman, L. Bradley and S. Goodell. 2011. Service-learning: Multidisciplinary approach to teaching college students about community food security. Jour. of Nutrition Education and Behavior 43(Suppl 4S1):S18.

Condo, E.P. and K.E. Martin. 2002. Health professions and cooperative extension An emerging partnership. Jour. of Extension 40(4).

Falter, R.A., K. Pignotti-Dumas and S.J. Popish. 2011. A service learning program in providing nutrition education to children. American Jour. of Pharmaceutical Education 75(5):1-7.

Gaster, M.A. 2011. Service learning: where is the emphasis? Teaching and Learning in Nursing 6:19-21.

Gazsi, C.C. and K.N. Oriel. 2010. The impact of a service learning experience to enhance curricular integration in a physical therapist education program. Jour. of Allied Health 39(2):e-61-67.

Hansen, R.S. 2006. Benefits and problems with student teams: Suggestions for improving team projects. Jour. of Education for Business 82(1):11.

Henry, B.W. and A.D. Ozier. 2009. Dietetic students achieved learning outcomes through course connections and experiential learning. Jour. of the American Dietetic Association. 109(9) Suppl 3: A-46.

Holston, D.M. and C.E. O'Neil. 2008. Students' evaluation of a communication-intensive, service-learning project in a dietetics course. NACTA Jour. 52(3):2-8.

Kessler, L.A. and B. Burns-Whitmore. 2011. Student perceptions of reflection tools used in a service learning community nutrition course. NACTA Jour. 55(3):67-69.

Kim, Y., C. Clasen and A. Canfield. 2003. Effectiveness of service learning and learning through service in dietetics education. Jour. of Allied Health 32(4):25-78.

Marcus, M.T., W.C. Taylor, M.D. Hormann, T. Walker and D. Carroll. 2011. Linking service-learning with community-based participatory research: An interprofessional course for health professional students. Nursing Outlook 59:47-54.

McDaniel, T.R. 1994. College classrooms of the future: megatrends to paradigm shifts. College Teaching 44:27-31.

Mehta, B., K. Rescheke, G. Cable and J. McDowell. 2003. Collaborations for the Community: The partnership of Extension and Pharmacy. Jour. of Extension 41(2).

Molee, L.M., M.E. Henry, V.I. Sessa and E.R. McKinney-Prupis. 2010. Assessing learning in service-learning courses through critical reflection. Jour. of Experiential Education 33(3):239-37.

Morris, P.V., J. Pomery and K.E. Murray. 2002. Service-Learning: Going beyond traditional extension activities. Jour. of Extension 40(2).

Poehlitz, M., M. Pierce and A. Farris. 2006. Delivering nutrition education in a service-learning course. Jour. of Nutrition Education and Behavior 38(6):15-20.

Querry, R.G. and P. Smith. 2004. Academic Bridge to the Community: The ABCs of a service learning model. Jour. of Allied Health 35:1-5.

Ross, M.E.T. 2012. Linking classroom learning to the community through service learning. Jour. of Community Health Nursing. 29:53-60.

Sifford, A. and L. Cunningham-Sabo, Moving community nutrition education beyond the classroom. Jour. of the American Dietetic Association. 109(9) Suppl 3:A-46.

U.S. Census Bureau. 2010 Decennial Census. www.factfinder2.census.gov Accessed March 12, 2012.

NACTA Reprint

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

Preparing Leaders for the Next Century: An Essay on Economic Education

December 1992

Paul N. Wilson

Abstract

Public policy decisions involving agricultural and natural resource issues are founded on prevailing world views and ethical considerations. Teaching undergraduate students how to analyze these fundamental factors demands the use of models and tools which go beyond the standard content of the conventional economics class. A political economy framework is developed in this essay which enables the instructor to capture the essence of policy analysis without losing the analytical rigor of economics. This framework serves as both a challenge to standard classroom approaches and as a complementary instructional tool.

The predominant emphasis in undergraduate economic education is placed on models of self-interest and purely competitive markets. In Colleges of Agriculture, rational maximization models at the consumer and firm level, and the assumption that agriculture is a perfectly competitive industry, continue to dominate our instructional programs. Yet it is increasingly obvious to this interested observer that a world view solely based on simple abstract models of economic rationality falls short in preparing our students for management positions in industry and government where human interaction is not costless, information is not complete, institutions matter, and where the exercise of economic power is an everyday occurrence. Our undergraduates need and deserve a broader, yet complementary, analytical framework which will equip them for grappling with the major agricultural and natural resource issues they will confront in their careers.

As noted by Jimmerson (1991):

"Leaders recognize the importance of their personal world view and the world view of others as basic to the change process. One's world view includes his/her culture, background and experiences which provide the basis for his/her values, goals, beliefs and assumptions" (p. 50).

Beliefs and Values

At the core of this political economy framework are beliefs and values (Figure 1). As noted by John Brewster (1970), beliefs reflect concepts of right/wrong, desirability/ undesirability, etc. Values are the relative weights assigned to these beliefs; they are observable in the choices we make. Divergent values generate conflict; yet the existence of shared beliefs increases the probability of a reasonable compromise. So a strong sense of community (i.e. common

beliefs) can constrain the generation of negative externalities and free rider behavior. Fundamentally divergent beliefs, however, invariably lead to a crisis: an adversarial and combative climate characterized by personal conflict, lengthy litigation and wasteful rent-seeking in the public policy process. Unfortunately, far too few of our classrooms echo from a recent discussion of the role and importance of beliefs and values in economic decision making (Frank, 1988).

Institutions

Built on beliefs and values, institutions reflect the prevailing ideology of an economic system (Bromley, 1989). Institutions are the rules and regulations, informal or formal, which govern the behavior of members of a group or society; in short, they are the "rules of the game". Institutions structure human interactions and reduce uncertainty in human exchanges.

In our undergraduate instructional programs we generally take institutions "as given". Yet a market system is founded on and dependent upon a sustainable institutional base; a truth that decision makers in eastern Europe and Russia are learning at this very moment. Well-specified property rights, Uniform Commercial Code-type regulations and a functioning and just legal system are necessary conditions for a "free market". Our lectures should reflect this reality.

Interests

Institutions and interests interact to generate the incentive structure for the decision maker (Elster, 1989). The incentive of self-interest and the rational maximization assumption have served as the driving forces in economic education for many years. Yet economists recognize that roles in society determine interests, and hence, the incentives facing decision makers. We also know that non-maximizing choices are prevalent throughout society. For example, stockholders and corporate managers may not share the same interests or incentives, nor may they maximize profits. So during the last decade economists have made significant strides in relaxing the rational maximization assumption as the predominant driving mechanism behind economic decision making. Our classroom presentations should include these relatively new and useful analytical advances in economics.

Interdependencies and Power

In economic life "no person is an island". Human interdependencies are ubiquitous. The crises issues (e.g. price

Wilson is a member of the Department of Agricultural Economics, The University of Arizona, Tucson, Arizona 85721

support programs, endangered species) confronting the agricultural and natural resource sectors do lend themselves, in some cases, to analysis using standard economic theory; yet potentially more useful at the undergraduate level are the not so standard economic models where interdependencies are explicitly discussed such as the interaction between principals and their agents, coalition building, and strategic behavior (Dixit, 1991). I question, however, whether the majority of our undergraduates gain a useful and intuitive understanding of these powerful concepts.

And like interdependencies, the imposition of one individual's or group's economic interests over the interests of another is a common occurrence in our world. The exercise of economic power can maintain existing institutions (i.e. status quo) or create new institutions, thereby modifying the "rules of the game" (Bartlett, 1989). Our undergraduate students understand interdependencies and the exercise of power on an experiencial level. They realize that others have the ability to alter their choices and influence their welfare. Yet in the classroom we usually restrict the discussion of economic power to models of monopoly, oligopoly and monopolistic competition; and only after we have spent three quarters of the semester using the assumption of perfectly competitive markets which are free of power! Which models increasingly reflect reality in the agricultural sector? Where and to what degree does the interplay of law and economics enter our undergraduate instructional programs?

Transaction Costs

Law is a, if not the, major cost in the exercise of power. Lobbying, litigation, excluding access and contracting are significant costs of doing business in our modern economy, including the agricultural sector. One farmer recently confessed that he includes a legal cost of $20/acre in the crop budget he presents to his lender. Legal and bureaucratic conflicts over water rights, qualifications for government programs, pesticide spray drift and alleged groundwater contamination have become an integral part of operating his business.

Broader, public policy decisions involving crisis-type issues depend upon answers to questions concerning environmental and economic impacts. Yet transaction costs associated with mustering environmental, biological and economic evidence are real and substantial. When and how do undergraduates prepare for such legal costs and informational uncertainty?

Which Path Do We Take?

I believe we take the broader path sketched in Figure 1 in designing our undergraduate instructional programs for the next century. There are at least three markers that will guide us. First, we must illustrate to our students that beliefs and values matter in economic decision making. The role of perceptions, culture, experience and matters of morality in economic decisions should not be ignored in the agricultural economics classroom of tomorrow.

Secondly, our future agricultural leaders deserve the richness in insights that economics can offer when narrow methodological biases take a back seat to improved student preparation and understanding. For example, the incorporation of institutional constraints and transaction costs into our finance, production or marketing class lectures can create a rewarding learning environment for both the students and the faculty member. We should encourage the efforts of instructors who integrate economic principles and tools from several world views.

And finally, professors must explore and analyze, in the classroom, the issues surrounding the exercise of economic power. Our major, crisis-type conflicts in the agricultural and natural resource sectors have potential winners and losers. In the public policy process some individual and/or group interests will count more than the interests of others. So let's not restrict the relevance of our teaching by ignoring the economics of power struggles. Our undergraduate students deserve the complete story. They deserve the best.
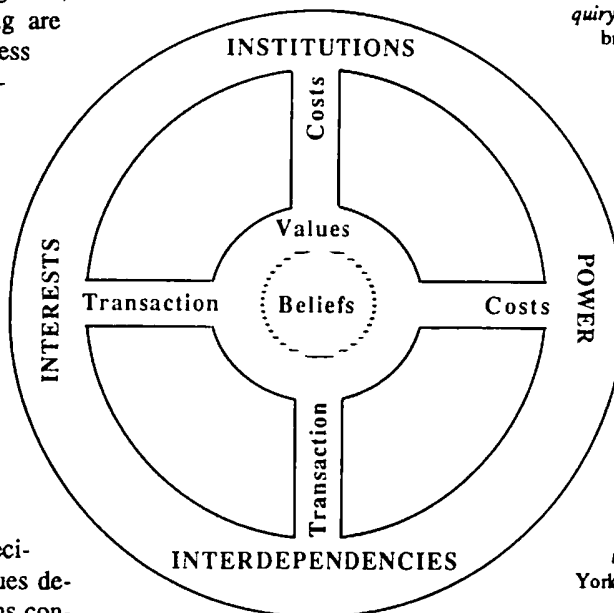
References

Bartlett, Randall. *Economics and Power: An Inquiry Into Human Relations and Markets.* Cambridge University Press, New York, 1989.

Brewster, J.M. *A Philosopher Among Economists,* J.P. Madden and D.E. Brewster (eds.), J.T. Murphy Co., Philadelphia, Pennsylvania, 1970.

Bromley, Daniel W. *Economic Interests and Institutions: The Conceptual Foundations of Public Policy.* Basil Blackwell, Oxford, 1989.

Dixit, Avinash K. and Barry J. Nalebuff. *Thinking Strategically: The Competitive Edge in Business, Politics and Everyday Life.* W.W. Norton and Company, New York, 1991.

Elster, Jon. *Nuts and Bolts for the Social Sciences.* Cambridge University Press, New York, 1989.

Frank, Robert H. *Passions Within Reason: The Strategic Role of the Emotions.* W.W. Norton and Company, New York, 1988.

Jimmerson, R.M. "Teaching Leadership: Principles and Approaches For An Undergraduate Leadership Course". *NACTA Journal* 35(1991):50-53.

Figure 1. A Political Economy Framework
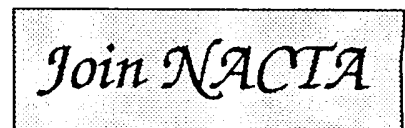
Farmer Interview Role Play Exercise

Agroecology field work includes use of biological and social science methods. Some of the latter may not be familiar to most students from agronomy, horticulture, ecology, and other biological science majors. Interviews of farmers and other food system actors often are central to the field observation and data collection process, and some practice with interview techniques builds valuable skills before student teams head for the field. A role play exercise using student ideas and creativity has proven to be a valuable and compelling way to teach these skills, and a specific example from a workshop in Sweden is used to illustrate the method.

Learning objectives are to 1) prepare students to conduct stakeholder interviews by practicing in a safe and stimulating learning environment; 2) learn to deal with different types of behavior during interviews by farmers and other clients; and 3) provide opportunity for group feedback and comments on how to improve interview techniques. We have found that a practice session greatly improves student capacities and confidence to conduct interviews, and especially to deal with unusual circumstances that may occur during the process.

Methods we have used include orientation lectures, team design of key questions before going to the field, one-on-one practice in pairs, and what has proved highly useful – role play exercises where students do the planning and follow through with short skits to illustrate what may happen in an interview and how to solve unexpected challenges. When first used, the role play was done by two instructors, after a short briefing about why interviews were important, types of questions to be asked, and which questions might be sensitive such as too much detail about economics of the farmer and family situation. Although the orientation and demonstration were useful, according to students, we soon came up with a better alternative.

In a week-long workshop in Sweden on nutrient cycling, we decided one evening to hand the responsibility of preparing for interviews the next day to several select students. Three pairs of students were asked to prepare mock interviews for the next morning, one to play the role of farmer and the other a student interviewer. Three stereotypical farmer types were chosen: 1) the reticent person who was shy, gave very

short answers, and was apparently unwilling to share much detail; 2) the highly verbal person who expanded on each answer, often diverging from the issue at hand, and rambling off in non-useful directions; and 3) the misleading person who gave contradictory information and appeared to attempt to mislead the interviewer. After a brief role play interview was completed in front of the entire class, other students and instructors were asked to critique the process, asking why certain approaches were used, and suggesting other strategies that might prove useful in each case.

Outcomes of the exercise included a high level of participation, an excitement of providing critique and suggestions of what might have been done, and a reflection on the entire interview process and how it could be improved. In the three examples, specific lessons were learned. In 1) the shy farmer example, the interviewer was forced to ask more than "yes or no" questions, to pursue the farmer's short answers with requests for more detail and depth, and to explore the "why" of specific responses and their basis in experience. In 2) the talkative farmer example, the interviewer was challenged to steer the conversation back to the topic, to guide the process without showing disrespect for the farmer, and to eventually achieve the stated goals of the interview. In 3) the misleading farmer, the interviewer was most effective when tactfully pointing out inconsistencies with such questions as *"I am a little confused about the amount of leached nitrogen from the field; could you please explain that again so I can take some careful notes?"* In all cases, the interviewers were urged to respect the stakeholders and their individuality, while still striving to achieve the best possible information about that farm or landscape. It proved both entertaining and useful.

This series of role play interviews sought to build an appreciation of overall context, while the specific objectives of interviews were to help understand the farm, landscape, watershed, and regional importance of nutrients from farming that were currently causing pollution of nearby lakes and rivers to the sea. The interviews with stakeholders also revealed a range of opinions about the nature of the nutrient runoff challenge and how serious this was in the present and potentially in the future. One of the most important outcomes was a new familiarity with some of the challenges that could be faced when talking with

individual farmers. The safe space provided for the role play exercise was reported by students to encourage their creativity and enthusiastic acting of roles in preparation for interviews later in the week with actual farmer and people working at the landscape level.

Student participants further explained that the opportunity for critique after the role play exercise was especially valuable in assessing "how they had done" in adapting to the stakeholder and his/her response and attitudes toward the questions and the interviewer. To be sure, we selected some extreme stereotypes for the three farmer roles, and in practice there could be elements of each in any particular interview. This enhanced the excitement of the interviews, as the larger student group was not advised ahead of time which types of farmer or stakeholder would be included in the interviews. Probably the best dimension of the exercise was that students themselves came up with the individual and creative roles they played, and the reception of the workshop group was highly positive to seeing their peers perform in this educational activity.

Submitted by:
Charles Francis and Lennart Salomonsson
University of Nebraska - Lincoln

Statement of Graduate Teaching Philosophy

I consider teaching an important part of my academic career and devote an inordinate amount of time, effort, and commitment to teaching because I want to improve the performance of each and every student. To be an effective teacher, I follow the strategies and philosophies listed below.

1) I present well-planned, structured, and organized lectures and courses.

2) At the beginning of the class, I review previous lectures and list the topics to be covered in the current lecture.

3) I assign readings and distribute class notes in advance, giving students ample time to prepare, which significantly improves their grasp of the lecture. Students appreciate advance distribution of the notes, and have told me numerous times that it makes a world of difference if they have read the assignments.

4) I give short quizzes to encourage students to come prepared for the class.

5) I always spend a considerable amount of time preparing before each lecture.

6) I focus heavily on good oral and written communication.

7) I employ the following teaching techniques: clear writing on the board, power point presentations, use of smart board, and software to solve problems.

8) I clearly explain the materials step by step.

9) I divide complex topics into segments and make it easier for students to understand.

10) I use graphical and mathematical analysis to improve students' understanding of the subject matter.

11) My subject matter coverage is in-depth, rigorous, and challenges students to reach their maximum potential.

12) I emphasize understanding the subject matter rather than rote memorization.

13) I focus on applications of theory by using real world examples.

14) I use journal articles to keep the students at the cutting edge of recent developments in the subject matter.

15) During my lectures, I ask students frequently if they have any questions that need to be clarified.

16) At the end of each class, I summarize material covered in that lecture.

17) I encourage students to participate in the class discussion by allocating 5-10% of total scores to participation. I also give small bonus points (1% of the total grade) for answering a critical question and for asking challenging questions. This approach keeps students excited, motivated, and interested in the lectures.

18) I use "food for thought" coupons from the university and my own money to take top students for lunch.

19) I also give extra credit (5%) if a student gives a lecture on selected topics. This approach not only enhances the understanding of the subject matter but also builds students= confidence in their public speaking skills.

20) I employ humor in the classroom. Humor not only keeps the class interesting but also can be a powerful communication and teaching tool.

21) I assign problem sets and class projects dealing with real world agricultural problems. For these projects, I work with students very closely and take them through various steps: find topics of mutual interest, aid them with data search and collection, assist with the review of literature by reading numerous articles along with them, teach students about theoretical models, help with empirical analysis, and continuously work with them on the art of writing papers. From these research projects, I help the students to publish journal articles.

22) I avoid assigning too much weight to any particular exam or homework so that students will not lose many points if they did not do well on that exam or homework.

23) I keep students abreast of their progress by giving frequent feedback.

24) Before each exam, I review all the portions covered in the class.

25) I am readily available and easily accessible to students during the office hours and other times. I encourage students to contact me at any time to clarify doubts.

26) I use a website (http://webpages.uidaho.edu/agecon533/) to post my syllabus, notes, assignments, and past exams. This helps students to know what to expect on upcoming assignments, quizzes, and exams.

27) My extracurricular activities include: inviting students for dinner during Thanksgiving, Christmas, and other holidays; organizing picnics, camping trips, and ski trips for students.

28) It is important to reward hard-working and deserving students. I always nominate my students for scholarly awards. My students have received awards at the department-level, college-level, university-level, and professional associations.

Submitted by:
Stephen Devadoss
University of Idaho

Motivation for Class Team Projects in Agroecology: Potentials for Super Teams

Creating high levels of motivation for class team projects involves assurance that individual contributions will be recognized, thoughtful design of ground rules, and convincing students about the long-term value of the exercise for future employment. Various methods have been used to identify individual as well as team contributions, in response to student concerns. The importance of setting up clear norms for teams to follow have been explained (Patterson et al., 2005), and general teamwork challenges thoughtfully summarized in a review by Whatley (2009). We have tested several team project models including imbedding instructors and teaching assistants in the teams [highly time-consuming], providing in-class time for some team meetings [valuable strategy], and grading both individual sections and overall team reports [current

method in Agroecology at UNL]. In this teaching tip we provide record of a highly successful "super team," composed of the Agroecology course instructor, the seminar's graduate teaching assistant, and three highly motivated undergraduate students. Together the super team embraced the challenge of exploring systems learning in Agroecology, and the value of an interdisciplinary team perspective to students, faculty, and future employers.

Learning objectives for team projects include preparing students for future positions in industry, government, NGOs, and academia; helping students better appreciate their personal strengths in a team situation; and honing communication skills including the abilities to discuss and compromise when there are differences of opinion on how to proceed with a task. When recruiters from agriculture and food industry companies visit campus interviewing potential new employees, it is noteworthy that they assume a certain level of technical competence and question students about their experience in team building and participation, their communication skills, and their potential to address the public with confidence about environmental and social issues. For this reason many instructors include team project activities as an essential component of courses, especially at the senior level and in capstone experiences.

Methods for introducing and conducting team project activities in this course have evolved through instructor experience and in response to student evaluations. Long-concerned that students were not totally motivated in team projects in the conventional course setting, we have been searching for alternatives. In the 2003 Agroecology course at UNL, four students responded in highly creative ways to a mid-term question about the importance and potential consequences of successful interdisciplinary approaches to education. In response, we invited the students to join a small study group to further explore the topic outside of class, together with the instructor and teaching assistant, and develop a manuscript for publication based on their research findings.

The immediate reward was to submit their team draft in place of the second mid-term exam, while the long-term incentive was the potential for an in-depth team research experience in an area of mutual concern, with the potential for a publication, something recognized as important by the graduate student team member and undergrads who were considering further academic degree programs. We were inspired by the model used by Professor David Pimentel at Cornell University, who convened a select group of undergrad and grad students each year in a seminar designed to

explore a topic of contemporary and critical interest to society and to create a journal article produced by the team (for example, Pimentel et al., 1994).

Our five-person team met throughout the semester on campus or at the instructor's home, developed an outline of important topics, and decided on a division and distribution of labor. During preliminary discussions and telling our individual stories, it became apparent that each of us had taken different paths to arrive at an awareness of the importance of interdisciplinary research and thinking. An early activity was to each write a short synopsis of this experience to share with the others. We also recognized that one of the prime motivators for our undergraduate students during their final year of study was potential to successfully interview and enter the job market. We needed to know how valuable they considered courses from a range of disciplines, and thus how important team projects would be as motivators for systems studies.

It was also important to learn from faculty who were undergraduate advisors what importance they put on an interdisciplinary undergraduate experience, since they were the people directing students toward specialization or generalization in their course choices. Lastly, we needed to quantify, if possible, the criteria that companies were using in their interviews and review of credentials of our graduates with respect to an interdisciplinary focus of their studies. We designed three questionnaires for the groups – students, faculty advisors, industry personnel specialists and recruiters – to see if their opinions differed on the value of a broad, systems-oriented undergraduate education. The results of the local surveys confirmed much of what we read about interdisciplinary education, and provided some justification to continue to use team projects as an important component of Agroecology courses.

Outcomes of the team research, information evaluation, and synthesis included two manuscripts for potential publication. In one paper, we outlined our different routes to appreciating the importance of a broad perspective in education. One team member studied philosophy for three years, changed to environmental ethics, then to horticulture, and finally studied agronomy with a specialization in ethics of land use and potentials for diversification of peri-urban food production. Another began in chemical engineering, changed to biological systems engineering, and then settled in agronomy to prepare for a future career in farming and the ag industry. A third team member studied agronomy from the start, with a second major in international studies to prepare for development work. Another team member knew during the first two semesters that environmental

studies was not broad enough, thus used an available option to create an individualized program of study that included sociology, political science, and development in addition to environmental specialization. The instructor began in production agronomy, specialized in plant breeding, worked with small farmers in the developing world and finally focused on sustainable agriculture and agroecology. The stories were so diverse and compelling that we summarized them in a manuscript, "Discovering the whole: multiple paths to systems learning", that was accepted and published in a teaching journal (Schneider et al., 2005b).

The results of the survey of students, advisors, and employers revealed a wide range of opinions among those surveyed, with students more enamored with the idea of a broad, interdisciplinary course of study than many of their advisors. The latter expressed interest in interdisciplinary perspectives, and were concerned that the opportunity cost of taking too many courses outside the major field would not help their advisees and eventual graduates to be competitive in a job market that they perceived as seeking mostly specialists in soils, plant protection, plant breeding, or other narrow field. The employers surveyed were highly receptive to the idea of interdisciplinary education for undergraduates. They embraced the concept that graduates needed a broad education and appreciation of the complexity of the real world they would face. One employer stated, *"You should provide the education, and we will provide the training for the specific tasks people are expected to accomplish."* Thus there appeared to be a disconnect between student interests and faculty advising, and a closer correspondence of what students were seeking and the criteria used by employers in their choice of new recruits. In reflection about the process, we surmised that the survey itself was a potential educational tool with all three groups who may now develop more insight about the importance of interdisciplinary study (Schneider et al., 2005a).

In summary, we explored the motivations, process, and outcomes of interdisciplinary team projects in a course in Agroecology. Accepting that a broad perspective on issues and challenges in the farming and food system would only become more complex and difficult in the future, we were convinced that a systems perspective that embraced multiple disciplines was essential to tackle the uncertainty of sustainable food production with climate change, scarce production resources, changing diets and competition for food, and current inequities of the distribution of costs and benefits within the present system. It was clear that each of us had taken a different route to the

appreciation of a systems approach that required tools and perspectives from multiple disciplines. From the survey results we found that students, advisors, and employers were in some agreement about the value of interdisciplinary studies for undergraduates, but there was concern especially among advisors that the demand was still for specialists in unique aspects of agriculture.

In general, the information we discovered has been useful in providing motivation to students in subsequent agroecology courses about the value of team projects in class, and more broadly the importance of building capacities for team work that will be useful in future job settings. Everyone on our small "super team" decided that this was a valuable personal and professional experience, and that similar opportunities should be afforded to students in the future. We have yet to find viable ways to extend this type of intensive experience in team building and group research to the entire class, in part due to the limited time and energy of instructors. Intrinsic motivation of students continues to be a limitation, and just providing an example of the model along with examples of successful outcomes appear to be inadequate to entice most students to pursue this intensive activity.

References

Patterson, M., A. Carron and T. Loughead, 2005. The influence of team norms on the cohesion-selfreported performance relationship: A multi-level analysis. Psychology of Sport and Exercise 6:479-493.

Pimentel, D., G. Rodrigues, T. Wang, R. Abrams, K. Goldberg, H. Staecker, E. Ma, L. Brueckner, L. Trovato, C. Chow, U. Govindarajulu and S. Boerke. 1994. Renewable energy: Economic and environmental issues. BioScience 44(8):536-547.

Schneider, M., A. Colglazier, R. Beutler, C. Pollard, and C. Francis. 2005a. Student, advisor, and employer opinions on interdisciplinary education in agriculture. J. Natural Resource & Life Science Education. 34:101-106.

Schneider, M., A. Colglazier, C. Pollard, R. Beutler and C. Francis. 2005b. Discovering the whole: Multiple paths to systems learning. NACTA J. 49(2):15-22.

Whatley, J. 2009. Ground Rules in Team Projects: Findings from a prototype system to support students. J. Information Technol. Educ. 8:161-176.

Submitted by:
Mindi Schneider
Cornell University

Charles Francis
University of Nebraska – Lincoln

Book Reviews

Spy the Lie: Former CIA Officers Teach You How to Detect Deception

By Philip Houston, Michael Floyd, Susan Carnicero and Don Tennant, 2012, St. Martin's Press, $13.70 (Amazon.com), 272 pages. ISBN: 78-1250005854

Overview from the Publisher: Three former CIA officers—among the world's foremost authorities on recognizing deceptive behavior—share their proven techniques for uncovering a lie.

Imagine how different your life would be if you could tell whether someone was lying or telling you the truth. Be it hiring a new employee, investing in a financial interest, speaking with your child about drugs, confronting your significant other about suspected infidelity, or even dating someone new, having the ability to unmask a lie can have far-reaching and even life-altering consequences.

As former CIA officers, Philip Houston, Michael Floyd, and Susan Carnicero are among the world's best at recognizing deceptive behavior. Spy the Lie chronicles the captivating story of how they used a methodology Houston developed to detect deception in the counterterrorism and criminal investigation realms, and shows how these techniques can be applied in our daily lives.

Through fascinating anecdotes from their intelligence careers, the authors teach readers how to recognize deceptive behaviors, both verbal and nonverbal, that we all tend to display when we respond to questions untruthfully. For the first time, they share with the general public their methodology and their secrets to the art of asking questions that elicit the truth.

Spy the Lie is a game-changer. You may never read another book that has a more dramatic impact on your career, your relationships, or your future.

Reviews

Spy the Lie provides insights from highly experienced practitioners of deception detection. Readers will not only learn useful perspectives on detecting deception, but to also be aware that lie detection is usually not easy and requires an open mind and strategy.

The primary obstacles that gets in the way of detecting deception are the belief that people will not lie to you, along with a bias that people are innocent until proven guilty and being uncomfortable judging others. The authors begin by suggesting one look for deceptive behavior within five seconds of a question, as well as for a cluster of such behaviors - a single "suspicious" behavior may mean nothing.

Most of Spy the Lie is taken up with specific suggestions on what to look for. For example, failure to understand a simple question is a deceptive behavior. Another - deceptive persons sometimes respond to an allegation with a truthful statement that casts him/her in a very favorable light such as giving Bibles to the homeless. Truthful responses tend to be direct and spontaneous, and the person is alert and composed. Unfortunately, untruthful persons can also show these behaviors - especially if prepared.

Failure to directly answer a question, directly respond with a denial, repeating the question, making general statements in response (e.g. "I would never do something like that"), non-answer statements, inconsistent statements, and going into attack mode are all indicators of untruthfulness. Other such indicators include procedural compliance, trying to butter up the questioner, involving religion (e.g. "I swear to God"), selective memory, and smiling in response questions about a heinous crime are other indicators.

Presumptive questions, such as "What happened at Nicole's last night?" are preferred over leading questions - "You were at Nicole's last night, weren't you?" The best question - "Is there any reason any of the neighbors will tell us they saw you in the area last night?" (Broader is better, not limited to the next-door neighbor as the suspect may know he/she wasn't home.) The authors also advise against bluff questions such as "We have someone who says he saw you in Nicole's neighborhood last night."

A suspects lack of eye contact, closed posture, general nervousness, and preemptive responses are not good indicators of untruthfulness per the authors. The authors suggest sitting interviewees in a chair that has wheels, rocks and swivels, and even movable arm rests. This allows nervous body impulses to be seen.

Spy the Lie ends with suggested question lists for several situations, as well as including a number of actual questioning situations involving well-known cases.

Submitted by:
Loyd E. Eskildson (posted on Amazon.com)

It was an interesting read, with real life examples. However, I was hoping for a little more. Good advice about interviewing included when to pursue details of an admission vs. inviting additional or deeper admissions/information first; and recognizing and setting aside our own biases when presented with convincing statements, like "I love my child. I could never hurt him!" I was happily surprised by the direct, but non-blaming approach recommended by the authors in an effort to reach the ultimate goal of getting (more) information. All in all, I would recommend this book for someone who is interested in a light read with good information. Just don't expect any real neat tricks or sure-fire way to detect lies.

Submitted by:
Kathy Spengler (posted on Amazon.com)

The book is written in a style that many non-professional readers can easily read and understand. For the most part, the subject matter of the book would be of interest to law enforcement professionals and other professionals who have to conduct interviews and try to detect and overcome attempts at deception, including: government investigators; inspector general personnel; lawyers; psychiatrists and other mental health professionals; alcohol and substance abuse counselors; probation officers; private investigators; and investigative journalists.

Although many non-professional readers could easily read and understand the book, they should not expect that reading the book will allow them to quickly learn how to detect, evaluate, and overcome deception by other people. The book is too short, the subject matter is too technical, and the techniques discussed are not easily learned or mastered by a non-professional reader.

This book should not be considered exhaustive or definitive on the subject of detecting and evaluating deception. One weakness with the book is the absence of any detailed references or citations to other publications or studies about detecting signs of deception, evaluating signs of deception, or conducting interviews to overcome deception. But, the book would be a very good starting point for any reader willing to read additional books to learn how to improve their ability to detect, evaluate, and overcome deception by other people.

Submitted by:
E. Jaksetic (posted on Amazon.com)

All the Dirt: Reflections on Organic Farming

By Rachel Fisher, Heather Stretch and Robin Tunnicliffe. Touch Wood Editions, Victoria, BC, Canada. Paperback, 228 pages. $30.00. ISBN 978-1-972129-12-8.

For a student or any young person interested in starting an organic farm, this book is a revelation of the complexity of the task as well as the valuable personal rewards that may result. For the consumer who is concerned about where their food comes from and how it is produced, All the Dirt is an excellent primer on the organic production practices and clear explanation of why organic food may cost more than what is found in the typical big box retail outlet. For anyone concerned about the sustainability of a healthy environment as well as our food supply, this is an excellent introduction to what is likely the long-term future of agriculture.

All the Dirt is a highly personal set of stories written by three committed young women on Vancouver Island in British Columbia who were all determined to learn how to farm, to sustain themselves and their families, and to make a difference in the world. What is described here is their quest still in progress, the extensive learning curves from their individual and group experiences, and the joys and challenges that are encountered in their radical departure from mainstream agricultural production and marketing. It is riveting story.

Heather Stretch recounts her journey on Northbrook Farm (Chapter 1), a highly diverse small farm producing vegetables, berries, seeds, and poultry, located on land she shares with her aunt and uncle. With an English degree in hand, she was poorly equipped to start farming but highly motivated to grow healthy food and make a difference in the world. From design of the planting beds for irrigation to challenges of marketing to dealing with mummy berries in her fruit enterprise, Heather has learned from the ground up. She is now a successful partner in Saanich Organics, works each year with new interns who often go forth into farming

on their own, and an educator who willingly shares her understanding of organic production while continuing to learn.

Rachel Fisher describes the farming challenges on Three Oaks Farm (Chapter 2), and how she arrived there after an active apprenticeship with an experienced organic farmer. A highly introspective and spiritual person, she rather quickly realized that to sustain herself would require an expanded set of goals from the initial "back-to-the-land" focus to one of economic entrepreneurship. Over time, this has been accomplished without sacrificing social relevance nor leaving the community of highly-motivated farmers who share the journey, including the WWOOFer volunteers who share their labor in exchange for learning. Rachel and her organic farming partners all recount the enrichment that has come from including other people in their farm crew each year.

Robin Tunnicliffe presents an articulate description of her journey from apprentice to rented land to her current small Feisty Field Farm (Chapter 3), a low-lying patch that has responded well to careful management in spite of its shorter season and poor drainage. She describes vividly some early frustrations with establishing adequate soil fertility, coping with insects, and striving for resilience in an unpredictable climate. Robin especially notes the importance of friends and neighbors who were there to lend a hand or moral support. Her learning about farming came from the ground up, literally creating a fertile and profitable farm in a site marginal for vegetables, and she has shared this adventure with numerous interns, customers and friends.

The three authors come together to discuss why they are farming organically (Chapter 4), a useful introspective on their goals for themselves, their families, and society. They describe a litany of problems created by chemical agriculture, on the local scale as well as in the international arena where small farmers struggle to cope with competition created by industrial farming neighbors and a multinational marketing system that has no intent of creating equity of benefits to producers. They explore the impacts of consolidation, the questions surrounding GMO crops, the insensitivity to social issues on most industrial farms, the food safety issues, the question of animal welfare, and the debate about foods versus fuels. At the same time, the partners recount many examples

of their organic practices and many tasks necessary to make a farm work. Through the individual chapters they describe how to pound in posts for a deer fence, how to site and construct a greenhouse, and how to design the overall farm structure, along with the details of soil fertility, pest management, efficient water use, and dealing with heavy workloads and labor. The challenges facing organic farmers are summarized well in this chapter.

Lastly the authors recall their various adventures in marketing (Chapter 5), and how the multiple experiences led to their purchase of Saanich Organics and the realization of a certain level of scale efficiency in consolidating parts of their operations and especially the need for cooperation in reaching the public. In combining their energies and ideas, it has been possible to get specialized help in marketing and record keeping, to train young people in the necessary details of planning and efficient implementation of a work schedule, and to share good ideas as well as critical problems with like-minded people in their neighborhood. Conclusions are found in Chapter 6.

This book was written to attract more people into organic farming. It is not a panacea for the idealist, but rather a close look at the daily nitty-gritty of farming at this scale. The accounts are highly personal, and one feels individually acquainted with each of the women as well as their passion for food and farming as well as for each other. The practical farming details are thoughtfully blended into descriptions of practical goals and high aspirations, the concern for families and for community, and the need for diversity and inclusiveness. There is an extraordinary complement of full-color photos that giver personality and local context to the chapters. The book is rich with humor, as in the activity aptly named "the rainbow chard collective" that was included in the 2009 Pride Parade. This reviewer highly recommends the book to anyone who aspires to farm organically, and to a broader audience that would like to understand better the motivation of dedicated young people to the long-term challenge of healthy and safe local foods. The book is an inspiration, and one that should be made widely available.

Submitted by:
Charles Francis
University of Nebraska – Lincoln

Join NACTA

NACTA

north american colleges and teachers of agriculture

connect | develop | achieve

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.

<u>**Membership Categories (circle one):**</u>
- **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: _____

<u>**Send your completed form to:**</u>

**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
Neil Douglas, Chair
Berea College, Kentucky
Neil_Douglas@berea.edu

Membership & Public Relations
Ron Hanson, Chair
University of Nebraska - Lincoln
rhanson1@unl.edu

Educational Issues & Teaching Improvement
Kimberly Moore, Chair
University of Florida
klock@ufl.edu

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, Southern Illinois University
Lurline E. Marsh, University of Maryland
Ed Miller, Oklahoma State University
Foy Mills, Sam Houston State University
Jeannette Moore, North Carolina State University
Michael D. Mullen, University of Kentucky
Tory Parker, Brigham Young University
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
Bonnie Walters, University of Wisconsin, River Falls
Jerry Williams, Virginia Tech University
Dean Winward, Southern Utah University

International Committee
Chris Morgan, Chair
University of Georgia
acm@uga.edu

Host Committee Silent Auction Liaison
Greg Pillar
Queens University of Charlotte, NC
pillarg@queens.edu

Nominating
Jeannette Moore
North Carolina State University
jeannette_moore@ncsu.edu

NACTA Foundation Advisory Council
Jeannette Moore
North Carolina State University
jeannette_moore@ncsu.edu

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

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

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