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Agricultural Safety and Health Education: Practices, Attitudes, and Needs of Iowa Agricultural Educators

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Abstract

This study sought to identify Iowa agricultural educators' practices, attitudes, and needs regarding agricultural safety and health (ASH). Nearly 85% of high school agricultural educators reported teaching ASH in some capacity. The most commonly taught topics included animal safety, welding safety and power tool safety. Iowa agricultural educators rated, using a Likert scale, the importance of topic within ASH education. All topics presented were believed to be important, with machinery safety, tractors safety, and ATV safety rated the most important. Personal health topics including hearing protection and thermal protection were perceived as less important. Most educators believe the ASH materials available to them were quality and age appropriate. When presented with the statement, "I believe there is adequate training and professional development for teachers on ASH," nearly 70% of educators disagreed. Lack of time was cited by nearly 75% of teacher as a major limitation to teaching ASH education in their classrooms. These findings have implications for professional development.

Introduction

Family farms continue to dominate American agriculture (Murphy, 1992). According to the 2007 Census of Agriculture, 88% of farms in the United States are still family owned (Nelson, 2010). Family farms raise specific safety and health issues. These operations are usually exempt from regulatory control, often do not make modifications to reduce the event of injury or death, and allow children to operate machinery and drive tractors (Murphy, 1992).

Farming has historically been a hazardous occupation (Rivara, 1985). Worker fatality statistics from 2007 suggest that forestry, agriculture and fishing are the nation's most hazardous work industries (Murphy and Lee, 2009). Work death rates in these industries

are eight times higher than the all-industry average, and 80% of the work-related deaths in these industries occurred in agriculture alone (Murphy and Lee, 2009).

Unlike most industries, children and young adults make up a significant portion of the agricultural workforce (McCallum et al., 2005) and their exposure to agricultural hazards is routine and extensive. In 2006, it was projected more than 29 million youth under the age of 20 were exposed to agricultural hazards as either farmworkers, visitors, farm residents, or children of farm workers (Levy et al., 2011). Recent agricultural injury and fatality statistics reported a fatality rate of 43 per 100,000 youth (NIOSH, 2007). While the farm injury death rates have declined (Rivara, 1997), the rate is still higher than all other industries (Murphy and Lee, 2009).

There are three established methods to combating fatalities, injuries, and illnesses in industries: 1) engineer hazards out of equipment and processes, 2) enforce regulations that prohibit work and working conditions, and 3) educate workers on hazard recognition and encourage adoption of behaviors that will reduce the potential for injury, illness, or death (Murphy, 1992). In agriculture and on family farms specifically, two of these methods are difficult. While engineering is often boasted as the most effective methods at reducing worker exposure to hazards, farmers often take liberties to remove safeguards or modify equipment to better meet their needs (Murphy, 1992). Given that a majority of farms in the United States are family owned, state and federal legislation to prevent agricultural injuries and fatalities are not applicable (Murphy, 1992). Education has been viewed as the weakest method to reducing agricultural injuries, illnesses, and fatalities. However, literature suggests educating youth could have great impact on attitudinal and behavioral changes within agricultural safety and health (Murphy et al., 1996). Many agricultural safety and health (ASH) professionals view

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youth as more adaptable to change and more readily able to change their behavior and also think targeting youth is an effective way of educating adults who are in contact with youth (Murphy et al., 1996).

Nonprofit organizations and governmental agencies educate people about the hazards associated with agriculture. However, one weakness of these efforts is agriculture's dispersed workforce, making it difficult to gather groups for education (Murphy, 2003). It has been suggested that agricultural safety and health (ASH) education should become part of secondary agricultural education programs (Dyer and Andreasen, 1999; Florio and Stafford, 1969) and, in fact, Lee et al., (2004) described and evaluated the effect of a National Rural Health and Safety Initiative implemented by the National FFA Organization for its local chapters. In their book *Safety Education*, Florio and Stafford (1969) stated, "Education is the only feasible means of achieving this goal, and its failure to date indicates merely that initial efforts have not been sufficiently intensive and widespread. All schools in rural areas should provide training in farm safety and should support the activities of other organizations interested in this work" (p. 341).

More recently, Dyer and Andreasen (1999) concluded that safety of students is the most important job of an agricultural educator. However, little is known about the practices, attitudes, and needs of agricultural education instructors when it comes to ASH.

Purpose and Objectives

The purpose of this study was to identify agricultural educators' practices, attitudes, and needs regarding ASH education. The study had five specific objectives:

1. Determine Iowa secondary agricultural educators' current practices in ASH education.
2. Determine Iowa secondary agricultural educators' perceived importance of ASH topics.
3. Determine Iowa secondary agricultural educators' attitudes toward ASH education based on their responses to six belief statements.
4. Identify factors that limit ASH education in secondary agricultural education classrooms.
5. Identify types of resources Iowa secondary agricultural educators would be interested in using to teach ASH.

Literature Review

Educating youth to adopt safe behaviors when working in agricultural settings can be effective. Youth are moldable and still capable of changing behaviors, which becomes more difficult with age (Murphy et al., 1996). A number of reputable non-profit organizations, academic institutions and government organizations target young people with educational interventions.

Educational interventions aimed at reducing the number of agricultural injuries, illnesses, or deaths among young people come in many forms including farm safety day camps, interactive exhibits, demonstrations at country fair, and guest speakers in schools. However,

the effectiveness of such interventions is questionable. Community and farm-based interventions (i.e., farm safety day camps) often yield increases in short-term knowledge. However, long-term knowledge and behavior changes are unknown. Tractor training programs produced inconsistent results; with one study citing no change in behavior and another reporting change in safety behavior but no change in attitude (Hartling et al., 2004).

Seven school based interventions were evaluated and reported either an increase in knowledge and/or changes in attitudes towards agricultural safety, especially when active, hands-on participation activities were included (Hartling et al., 2004). These studies suggest the potential for successful interventions when ASH education is incorporated into the secondary agricultural education classroom. This idea is further strengthened when teaching methods, learning theories, and audience members of the two (i.e., agricultural safety and health and secondary agricultural education) are compared.

When studying ASH education and secondary agricultural education, common learning theories, instructional methods, and audiences quickly emerge. In ASH education and agricultural education, behaviorism and constructivism have emerged as effective learning theories (Cole, 2002; Doolittle and Camp, 1999). Behaviorism is based on positive or negative consequences after a behavior or action following an antecedent condition (Cole, 2002). In constructivism, people construct knowledge as they interact with the world, building blocks of knowledge and understanding (Murphy, 2003). In ASH education, constructivism helps individuals recognize hazards and adopt safe practices (Cole, 2002).

Both agricultural education and ASH education use hands-on, real-world experiences to educate youth. In secondary agricultural education, a hands-on (i.e., tactile) teaching approach has been promoted (Cano and Garton, 1994) because it engages students' psychomotor skills, heightening education and understanding (Newcomb et al., 2004). Similarly, instructional methods for teaching ASH should appeal to all senses of a student, and students should learn in the physical environment when possible (Newcomb et al., 2004). Ensuring that individuals can recognize agricultural hazards and understand how to respond safely is vital to effective education and can be accomplished by using case studies and allowing students to have hand-on experiences in creating safer agricultural environments (Lehtola and Boyd, 1992). As previously stated, school based interventions that employed participation among students saw increases in knowledge and attitudes towards farm safety (Hartling et al., 2004).

Secondary agricultural education and ASH education share a common audience—young adults. Secondary agricultural education is focused on educating students in grades 9–12, and in some cases middle school students, about agricultural science. Like most states, Iowa has approved standards and benchmarks for

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agricultural mechanics as part of its recognized state competencies (Iowa Department of Education, 1999).

The target audience for ASH education is youth involved in agriculture. Many ASH educators view youth as more adaptable to change and more readily able to change their behavior (Murphy et al., 1996). Emphasis on high school students is critical, between 1995 and 2002, most of 907 farm youth fatalities occurred to youth 16-19 years of age (NIOSH, 2007). Parallels in learning theories, teaching methods, and audiences suggest the secondary agricultural classroom may be the appropriate avenue for agricultural safety and health education. However, instructor perception of, and integration of ASH curriculum is unknown.

Materials and Methods

For this census study, all 216 secondary agricultural educators in Iowa were contacted. A web-based survey was the most feasible and appropriate method to collect data for this study. Web surveys can be conducted quickly, reach large populations, and are inexpensive compared with other survey methods, such as telephone or mail surveys (Ary et al., 2010).

Following Dillman's (2006) Tailored Design Method, the survey included an introduction and three sections of questions. The introduction welcomed educators to the survey, collected consent, and defined ASH. For this survey, ASH was defined as the proper handling and operating of agricultural equipment, livestock, tools, chemicals, etc., as to ensure maximum safety of the operating individual and minimized risk of injury or death. Providing this definition ensured all participants had the same concept of ASH completing the instrument. The introduction also explained the three categories that ASH was divided into for the purpose of this study (i.e., agriculture, mechanics, and personal health). The agriculture category included traditional farming domains such as tractor and animal safety. The mechanics category included safety domains such as hand tool and power tool safety. The personal health category included topics such as heat/cold protection, personal protective equipment, and eye/hearing protection.

The first section of the survey asked questions regarding current ASH education practices. Educators were asked to identify what agriculture, mechanics, and personal health topics they had taught during the current school year, how they integrated ASH topics into their classrooms, and what resources they used to teach the topic. The second section asked five questions about teacher's attitudes towards ASH education. Safety and health education is focused on behavioral change, which is influenced by attitude (Murphy, 1992). Educators were

Table 1. Cronbach's Alpha Coefficients for the five constructs in the survey instrument

Construct	Cronbach's alpha coefficient
Agriculture safety topics	.93
Mechanics safety topics	.92
Health safety topics	.89
Agricultural safety and health belief statements	.80
Agricultural safety and health educational resources	.68

asked to report their level of agreement with statements about ASH education and rate the importance of ASH topics.

The final section collected demographic information. Educators were asked to report their educational background, number of years in the profession, whether they had been raised on a farm, and if they ever sustained an injury as a result of an agricultural incident. The first, second, and third sections included seven, five, and 10 questions respectively.

The survey was piloted for comprehension and content validity. Four current agricultural education student teachers, a former secondary agricultural educator, and a university faculty member at Iowa State University with expertise in ASH deemed the instrument content and face valid. Cronbach's alpha coefficients were calculated post hoc for the five constructs in the survey (Table 1).

The survey was administered through SurveyMonkey. Dillman's (2006) recommended five-step contact approach for obtaining responses to Internet surveys, which was modified because of timing issues associated with the data collection. Iowa agricultural educators were contacted five times over a four week period beginning in late May. The first five contacts yielded a response rate of 55% (n = 118). Therefore, nonrespondents were contacted two more times in fall once they returned to their classrooms for the academic year. After seven contacts, the study had a useable response rate of 63.4% (N = 137). Early and late respondents were compared to determine nonresponse error. With the exception of one question regarding the importance of ASH education, the results of this study can be generalized to the entire population. The Iowa State University Institutional Review Board approved the initial and modified data collection procedures.

Data were analyzed using SPSS 19.0 and Microsoft Excel. Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated to determine the research objectives.

Results and Discussion

Iowa Agricultural Educators' Current Practices in ASH Education

Agricultural educators identified, from a list, which ASH topics they had taught in the last academic year. Topics were divided into three categories: agriculture,

Table 2. Agricultural safety topics Taught by Iowa agricultural educators (N =137)

Agriculture Safety Topics	Respondents teaching	
	f	%
Animal	115	83.9
Machinery	94	68.6
Chemical	87	63.5
Tractor	72	52.6
Grain handling	62	45.3
ATV	51	37.2
Combine	41	29.6
Confined spaces	37	27.0
Rural driving	29	21.2
Manure	24	17.5
Taught NO agriculture safety	5	3.6

Table 3. Mechanics safety topics taught by Iowa agricultural educators (N =137)

Mechanics Safety Topics	Respondents teaching	
	f	%
Welding	97	70.8
Power tool	96	70.1
Hand tool	94	68.6
Electrical	61	44.4
Fire	57	41.6
Small gas engine	53	38.7
Lawnmower	51	10.9
Chainsaw	26	19.0
Taught No mechanics safety	15	10.9
Ladder	10	7.3

Table 4. Health safety topics taught by Iowa agricultural educators (N =137)

Agriculture Topics	Respondents teaching	
	f	%
Personal protective equipment	80	58.4
Hearing protection	44	32.1
First aid	44	32.1
Back protection	29	21.2
Taught NO personal health safety	28	20.4
Heat/cold protection	14	10.2

Table 5. Integration of agricultural safety and health education in Iowa agricultural educators' Curricula (N =137)

Integration technique	Respondents	
	f	%
As part of an agricultural science unit	120	87.6
As a workshop or lab in class	65	47.4
As an extracurricular activity outside the classroom	29	21.2
As its own unit	19	13.9

mechanics, and personal health. Of the three categories, agriculture topics were taught most often. The most-taught topics within the agriculture (Table 2), mechanics (Table 3), and personal health (Table 4) categories were animal safety (83.9%), welding safety (70.8%), and personal protective equipment (58.4%), respectively. Only 3.6% of agricultural educators did not teach any aspect of agricultural safety, whereas 10.9% did not teach any aspect of mechanical safety, and 20.4% did not teach any personal health safety topics.

Agricultural educators selected which of four options best described how they teach ASH (Table 5). They could select more than one option. Almost 90% of agricultural educators taught ASH as part of another agricultural science unit (e.g., animal safety as part of a larger livestock unit). Only 19 of 137 (13.87%) educators taught ASH as its own unit.

Agricultural educators selected from a list the resources they used to teach ASH in their classrooms. Textbooks (62.8%, n = 86) and nonprofit organizations (62.8%, n = 86) such as Farm Safety 4 Just Kids and the National Safety Council were the primary resources used to acquire information to teach ASH. Less than 10% of agricultural educators identified professional teaching organizations as a resource.

Iowa Agricultural Educators' Perceived Importance of ASH Topics

Agricultural educators rated the importance of ASH topics. Topics were again divided into three categories:

Table 6. Iowa agricultural educators' perceived importance of agriculture safety topics (N=137)

Topic	Not important	Somewhat important	Important	Very important	M	SD
	f(%)	f(%)	f(%)	f(%)		
Machinery	1 (.7)	1 (.7)	50 (37.0)	83 (61.5)	3.59	.550
Tractor	1 (.7)	1 (.7)	54 (39.8)	80 (58.8)	3.57	.554
ATV	1 (.7)	9 (6.6)	45 (33.1)	81 (59.6)	3.51	.655
Chemical	1 (.7)	5 (3.7)	57 (41.9)	73 (53.7)	3.49	.608
Animal	1 (.7)	6 (4.4)	62 (45.6)	67 (49.3)	3.43	.617
Combine	1 (.7)	11 (8.0)	60 (44.1)	64 (47.1)	3.38	.666
Grain	1 (.7)	11 (8.0)	62 (45.6)	62 (45.6)	3.36	.663
Rural driving	3 (2.2)	13 (9.6)	58 (42.6)	62 (45.6)	3.32	.737
Confined Spaces	2 (1.5)	23 (16.8)	62 (45.9)	48 (35.6)	3.16	.752
Manure pit	1 (.7)	26 (19.3)	63 (46.7)	45 (33.3)	3.13	.767

Note. Scale: 1 = not important, 2 = somewhat important, 3 = important, 4 = very important.
Note: **Bold** = Mode

Table 7. Iowa agricultural educators' perceived importance of mechanics safety topics (N =137)

Topic	Not important	Somewhat important	Important	Very important	M	SD
	f(%)	f(%)	f(%)	f(%)		
Power Tool	1 (.8)	6 (4.5)	59 (44.4)	67 (50.4)	3.44	.621
Welding	0 (0.0)	9 (6.7)	58 (43.3)	67 (50.4)	3.34	.619
Fire	2 (1.5)	9 (6.7)	60 (44.4)	64 (47.4)	3.38	.697
Lawnmower	1 (.7)	11 (8.0)	64 (47.8)	64 (47.8)	3.34	.660
Electrical	1 (.7)	12 (8.9)	64 (47.4)	58 (43.0)	3.33	.667
Hand tool	1 (.8)	21 (15.9)	58 (43.9)	52 (39.4)	3.22	.734
Chainsaw	2 (1.5)	16 (11.9)	73 (54.5)	43 (32.1)	3.17	.698
Small Gas Engine	1 (.8)	17 (12.8)	77 (57.9)	38 (28.6)	3.14	.653

Note. Scale: 1 = not important, 2 = somewhat important, 3 = important, 4 = very important.
Note: **Bold** = Mode

Table 8. Iowa agricultural educators' perceived importance of personal health safety topics (N =137)

Topic	Not important	Somewhat important	Important	Very important	M	SD
	f(%)	f(%)	f(%)	f(%)		
First aid	2 (1.5)	10 (7.4)	61 (45.2)	62 (45.9)	3.36	.685
Personal protective equipment	1 (.8)	18 (13.7)	57 (43.5)	55 (42.0)	3.27	.721
Hearing protection	2 (1.5)	29 (22.0)	60 (45.5)	41 (31.1)	3.06	.769
Back protection	3 (2.2)	34 (25.2)	67 (49.6)	31 (23.0)	2.93	.755
Heat/cold protection	9 (6.7)	41 (30.4)	64 (47.4)	21 (15.6)	2.72	.807

Note. Scale: 1 = not important, 2 = somewhat important, 3 = important, 4 = very important.
Note: **Bold** = Mode

agriculture, mechanics, and personal health. In the agriculture category, machinery safety, tractor safety, and ATV safety were rated most important, and confined space safety and manure pit safety were considered least important (Table 6).

All topics in the mechanics category were rated important. The top two topics were power tool safety and welding safety (Table 7).

All topics in the personal health category were rated important (Table 8). First aid and personal protective equipment were considered most important, and heat/cold protection was rated least important.

Iowa Agricultural Educators' Attitudes Toward ASH Education

Agricultural educators reported their level of agreement with six statements about ASH education (Table 9). Responses regarding teaching enough ASH in the classroom were nearly evenly split between agree and disagree. Most educators believe the ASH

Table 9. Iowa agricultural educators' agreement with agricultural safety and health (ASH) belief statements (N =137)

Statement	Strongly Disagree f(%)	Disagree f(%)	Agree f(%)	Strongly Agree f(%)	M	SD
I believe the materials available to me about ASH are quality educational materials	3 (2.2)	37 (27.0)	92 (67.15)	5 (3.7)	2.74	.548
I believe the materials available to me about ASH are age appropriate for my students.	7 (5.1)	40 (29.2)	84 (61.3)	5 (3.7)	2.64	.640
I believe there are enough resources available to me about ASH.	5 (3.7)	50 (36.5)	74 (54.0)	5 (3.7)	2.58	.640
I am knowledgeable on where I can find additional materials concerning ASH should I want or need them.	6 (4.4)	52 (38.0)	71 (51.8)	6 (4.4)	2.57	.653
I believe I teach enough ASH in my classroom.	5 (3.7)	60 (43.8)	67 (48.9)	4 (4.4)	2.51	.620
I believe there is adequate training and professional development for teachers on ASH.	9 (6.9)	84 (61.3)	38 (27.7)	3 (2.2)	2.26	.612

Note. Scale: 1 = not important, 2 = somewhat important, 3 = important, 4 = very important.
Note: **Bold** = Mode

materials available to them are age appropriate and of quality. Nearly 70% of respondents disagreed with the statement, "I believe there is adequate training and professional development for teachers on ASH."

Limiting Factors in ASH Education

Agricultural educators identified limitations they face in teaching ASH. Time was an issue for nearly three-fourths of the educators (73.3%). Availability and quality of resources were less limiting (43.8% and 40.1%, respectively), and teacher understanding of the content and the importance of agriculture safety were limitations for only 11.7% and 4.4% of educators, respectively.

Resources of Interest for ASH Education

Agricultural educators identified from a list the teaching tools they might be interested in using to teach ASH. Using a three point Likert-type scale where 1= would not be interested in and 3 = would be interested in, Videos (M=2.76), simulators (M=2.75), and PowerPoint presentations (M=2.63) received the highest interest ratings, whereas guest speakers (M=2.40) and literature (M=2.38) were of least interest.

Summary

Agricultural educators in Iowa see ASH education as part of their role and content that should be taught in their programs. It was evident that what agriculture teachers value (i.e., see as important) is what they teach. Moreover, those safety topics seem to focus on traditional, production-oriented ASH areas like animal, machinery, chemical, and welding safety as well as general PPE. Although the student body enrolled in agricultural education continues to become more diverse (Retallick, 2010), agriculture teachers seem to place less value on health safety and other mechanic and agricultural safety topics that would be appropriate and applicable to broader audiences.

This study has implications to agricultural teacher education programs and the faculty in departments who offer agricultural mechanics training to preservice agricultural teachers. Similar to Ullrich et al., (2001)

recommendation, ASH training should be a vital component of the preservice program and should extend beyond traditional agriculture and mechanic safety to include a larger focus on related personal health safety which would have a broader impact on the diverse school-based agricultural education population. It is also recommended that the preservice training go beyond ASH training to include methods of teaching ASH as part of the required preservice coursework. The result of these recommendations will not only improve school-based

ASH education, but it could potentially impact informal ASH education in local communities. College graduates who receive this training as part of their coursework may also be in the individuals who help to sponsor and facilitate community farm safety-related events in their communities.

These findings have implications for ASH professionals providing resources to inservice high school agricultural educators. Based on results of this study, improved communication between ASH professionals and secondary agricultural educators is necessary. While most respondents agreed ASH education materials are quality, nearly 40% do not know where to find materials. In addition, the problem is perpetuated if teachers are unable to obtain adequate training and professional development as reported by the agriculture teachers in this state. Improved communications and collaboration as well as required professional development would impact the teachers' attitudes toward and ability to deliver ASH.

Improved professional development could increase the integration of ASH education in secondary agricultural education classrooms, thus improving ASH practices in secondary agricultural education and further improving the health and safety of agriculturalists. Iowa agricultural educators recognize a need for additional training and professional development.

Additionally, ASH curriculum should be created that is easily integrated into the secondary agricultural classroom and engages students. Educators in this study cited availability of time and resources as major limitations to ASH education. Integrating ASH into existing curricula is consistent with current knowledge about student learning and brain-based education, which suggests that teaching in context is beneficial (Bransford et al., 2000). Although Iowa agricultural educators are most interested in teaching ASH using videos and PowerPoint presentations, literature suggests that students respond better to hands-on and experiential learning activities (Murphy, 2003). The resources most appealing to educators might not be effective in teaching ASH topics.

Finally, additional emphasis should be placed on personal health and safety. Nearly 20% of teachers are not teaching any personal health safety topics. Prolonged exposure to health risks could be as devastating to a worker's livelihood as a machinery or livestock incident, and ASH professionals should consider increasing educators' awareness of the importance of personal health safety, including heat/cold protection and personal protective equipment.

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Understanding How Research Experiences Foster Undergraduate Research Skill Development and Influence STEM Career Choice

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Abstract

Since 2000, the University of Florida's Institute of Food and Agricultural Sciences (IFAS) has offered summer research internships at its Florida Agricultural Experiment Station to encourage undergraduate students to engage in science-focused education and pursue STEM-focused careers. The internships have provided students an opportunity to acquire hands-on research experience while working one-on-one with faculty members conducting research across a variety of disciplines. The purpose of this research was to assess the impact of the research internship by examining the research skills students developed and the career trajectories they chose. When comparing reported research-related skill levels before and after participating in the internship there were statistically significant ($p \leq .01$) positive changes in all 19 indicators of research skills. The two highest areas of gain were practical skills for conducting research and knowledge of the important literature in their field. Other key skills acquired were those related to critical and logical thinking and the ability to synthesize information. In addition, 64% of the respondents attended graduate school and 69% reported they were currently working in a science-related field. Results of the study demonstrated that hands-on research experiences at the undergraduate level improved the participants' self-reported research-related skillset.

Introduction

Science, technology, engineering and math (STEM) occupations have become critical to the continued economic competitiveness of the United States (US) and graduates skilled in these areas are in high demand (Carnevale et al., 2011). While a demand for such

workers exists, fewer students than the US economy currently demands are graduating with STEM expertise. The percentage of STEM bachelor's degrees granted has steadily declined from 35% in 1966 to 31% in 2008 (National Science Board, 2012). Given the increasing workforce demand for students with STEM backgrounds, STEM related internships might be beneficial in encouraging students who are considering the pursuit of a STEM degree. According to the National Association of Colleges and Employers (2011), "40% of new college hires will stem from internship and co-op programs."

The University of Florida's Institute of Food and Agricultural Sciences (IFAS) offers Research Internships to undergraduate students through the Florida Agricultural Experiment Station (FAES) each summer. The internship program is a cooperative effort between the College of Agricultural and Life Sciences (CALS) and the FAES. The FAES is the research arm of IFAS with a mission to discover, invent and develop applications of new knowledge in agriculture, human and natural resources. FAES faculty are based in various IFAS departments on the main campus in Gainesville and at research and education centers throughout Florida. The FAES has over 650 active research projects with specific goals and objectives led by faculty. The internship program places undergraduate students with a faculty member for a 6-week period during the summer to learn about an FAES Research Project and to contribute their knowledge to the research project. The internship program was initiated during the summer of 2000 with 11 participants. Over the years, the program has grown with 56 individuals participating during the summer of 2012. By the end of summer 2012, a cumulative total of 370 undergraduates from the College of Agricultural and

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Life Sciences had participated in a research internship through the FAES. Internship programs have been suggested as an effective way of providing students with meaningful experiences because of the direct and targeted impact they have on a students' professional development. An evaluation of the FAES program was performed to determine if it was meeting the objective of recruiting students into STEM fields and careers.

Learning experiences that are designed to intensely focus on preparing students for future careers can improve their confidence to enter those careers (Esterl et al., 2006). Students acquire concrete experiences from internships because they are taught using direct experiences relevant to their specific career interests (Morgan and King, 2013). They retain and apply concepts effectively when they learn through active experiences (Fosnot, 1996). In the scientific fields, research projects have been used to directly improve and inspire students' scholarship. Research projects that intensively engage undergraduate students can enhance their academic experience (Lopatto, 2004). Such projects inspire students to be part of the scientific community due to the relationships they form with faculty members (Hunter et al., 2007). These relationships provide students with opportunities for professional development, which in turn makes it possible for them to effectively transition from college to the workplace. Students that have participated in intensive internship programs may be more prepared to enter the workplace because they are psychologically prepared to navigate through new cultural expectations (Stitts, 2006). Internship programs may help graduating college students determine if a career of interest is appropriate for them, since these programs make it possible for students to clearly understand the expectations of specific careers (Neapolitan, 1992).

Through internships, students acquire specific career skills and work experience they could not acquire in a classroom setting (Alpert et al., 2009; Boger and Lim, 2005; Busby, 2003; Chi and Gursoy, 2009; Mello, 2006; Van't Klooster et al., 2008). Internships play an important role in bridging classroom experiences and practical career application (Ewing, 1973; Nevett, 1985). Through intensive internship projects, students are able to put into practice the theoretical knowledge they gained in the classroom (Busby, 2003; Cho, 2006; Lam and Ching, 2007; Walo, 2001). Sax (2001) stated "*carefully placing students in internships and mentorships is also an important mechanism for exposing students to ways in which scientific research goes beyond the abstract and theoretical by addressing societal issues and needs*" (p. 168). For example, a study of the outcome of an animal science internship program at the Ohio State University Agricultural Technical Institute, examining ten years of records, showed that students who participated acquired communication skills, improved creative thinking abilities, improved job interviewing and networking skills and improved self-confidence and leadership skills (Bennett-Wimbush and Amstutz, 2011).

Internships have also been shown to improve students' chances of securing employment in the career of their choice (Callanan and Benzing 2004; Knouse et al., 1999). This is because internships improve their career decision-making abilities (Brooks et al., 1995; Taylor, 1998) and equip them with skills that are relevant for the jobs they seek (Garavan and Murphy, 2001). Internships also develop other personal abilities that are essential for career advancement and are sometimes explicitly required by certain jobs, such as problem-solving skills, leadership and communication skills and interpersonal skills (Ruhanen et al., 2013). Gaining these skills may encourage students to apply for jobs they would not have applied for previously. They also enable students to have a competitive edge in the work place (Alpert et al., 2009; Boger and Lim, 2005) often leading to higher starting salaries (Coco, 2000; Gault et al., 2000), higher job satisfaction (Divine et al., 2007; Gault et al., 2000), more job opportunities after graduation (Coco, 2000; Divine et al., 2007) and improved job related skills (Divine et al., 2007; Knemeyer and Murphy, 2002).

Lastly, internships motivate undergraduate students to pursue further learning at the graduate level (Alexander et al., 1998; Bauer and Bennett, 2003; Hathaway et al., 2002; Karcher and Trottier, 2014; Lopatto, 2007; Tyler, 1971). Rigorous scientific research introduces students to the world of scientific research (Sadler and McKinney, 2010). By participating in internship programs, students acquire skills they can directly use for conducting research at the graduate school level and gain a deeper understanding of the literature in the field. Through engagement with the vast literature in their field and carrying out research, undergraduate students improve their intellectual curiosity (Bauer and Bennett, 2003) and are able to explore research questions on their own. Schowen (1998) found that most undergraduate students who participate in research programs in their universities pursue advanced studies in their fields. For some undergraduates, the research experience they get from an internship project may guarantee them successful admission to graduate schools. Kinkead (2003) notes that, "*undergraduate research projects can provide students with the coinage of the realm that ensures their admittance into prestigious graduate schools*" (p. 10).

Theoretical Framework

Kolb's (1984) experiential learning theory served as the theoretical framework for this study. This theory is appropriate because it "provides one of the few comprehensive and fully generalized models" (Kayes 2002, p. 140) of learning. The validity and reliability of the learning model based on the theory has been widely supported by extensive research (Hickox, 1991; Iliff, 1994; Kayes, 2002). The theory makes it possible for students to get an effective learning experience because of the four-stages its model is based on: concrete experience, reflective observation, abstract conceptualization and active experimentation (Cowan,

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1998; Petkus, 2000). The concrete experiences students acquired through the four stages provide them with a firm foundation for observations that are integrated into generalizations and guide their interactions with the world around them (Loo, 2010). The model provides a structure for assembling techniques and strategies in a concrete format that can be used to systematically guide students that are undecided about future career choices (Atkinson and Murrell, 1988). It explains how experiences are translated into concepts that may guide student's active experimentation and their choice of new careers or educational experiences (Healey and Jenkins, 2007).

Experiential learning theory recommends an "*orientation toward teaching and learning that values and encourages linkages between concrete educative activities and abstract lessons to maximize learning*" (Warren, 1995, p. 239). Learning environments that apply the theory encourage students to directly apply what they are learning and then generalize the information outside the learning environment (Beard and Wilson 2006; Lamm et al., 2011). The experiential learning modes are based on activities that "*include cooperative education placements, practicum experiences and classroom-based hands-on laboratory activities*" (Cantor, 1997, p. 3). These activities help students "*reach new levels of cognitive, perceptual, behavioral and symbolic complexity*" (Chickering, 1981, p. 2). In addition, "*the experiential learning theory affirms the importance of experiential activities, such as fieldwork and laboratory sessions*" (Healey and Jenkins, 2007, p. 186). Since the theory emphasizes the importance of personal experience in future engagement (Baker et al., 2012; Kolb, 1984; Roberts, 2006), it is expected that direct engagement in a research experience would encourage students to think about using research outside of school, perhaps fostering efficacy to engage in a STEM focused career.

Methods

Data Collection

A researcher-designed survey instrument was used to identify (a) the research skills FAES internship participants developed during the six weeks they participated in the FAES internship program, (b) internship participants' career path after graduation and (c) details of internship participants' current employment status. To identify the research skills internship participants developed during the FAES internship program Bauer and Bennett's (2003) undergraduate skills and abilities scale was adapted to a retrospective pre/posttest design requesting respondents to identify their level of competence with specific research oriented skills on a 5-point Likert type scale. Open-ended questions were used to collect respondents' descriptions of career paths after graduation. A panel of experts reviewed the instrument for reliability and validity purposes. The study protocol was approved by the University of Florida's Institu-

tional Review Board and all participants provided written informed consent prior to participation in the study.

Participants/Sampling

A list of the 370 FAES internship program alumni was gathered from paper records kept by the research internship program. University of Florida student identification numbers were used to connect past participants to University of Florida Alumni Association records to determine recent mailing addresses. The survey was distributed through the mail using Dillman et al., (2009) Tailored Design Method including a pre-notice, the mailed survey instrument and two reminders. A pre-notice letter was sent by the Dean's office to notify participants of the upcoming survey and its importance. One week later it was followed by the paper survey with a postcard reminder sent two weeks later. If a response was not received one month after the initial contact, a second paper survey was sent with one last reminder. In total, 142 participants responded out of the 370 contacted with a completed survey resulting in a 38% response rate. Demographic characteristics of respondents were compared to the entire alumni group to assess for differences and were found to be non-significant; therefore the respondents were considered representative of the population of interest.

Data Analysis

Respondents were asked a series of 19 statements in which they had to indicate how strongly they agreed or disagreed about the level of impact their internship experience had on their feelings about research and the role of the faculty mentor in fostering a positive research experience. Respondents were also asked if they took courses they had not previously considered, changed their major, or attended graduate school after completing their internship. Statistical frequencies for the questions were analyzed using SPSS.

Respondents were then asked to indicate their level of competence on the 19 research skills developed by Bauer and Bennett (2013) before and after their research internship experience. The before and after response items were scored on a 5-point Likert response from 1 = *No competence*, 2 = *Low competence*, 3 = *Somewhat competent*, 4 = *Competent* and 5 = *Highly competent*. Since the instrument was designed to indicate a single construct, research skills, all 19 items were averaged into an overall mean score. A dependent sample t-test was conducted to test the differences in responses both before the research internship and after. Differences in means with a p-value of 0.05 or lower were considered statistically significant.

Three open-ended questions were given to respondents regarding their career decisions after graduation. They were asked to describe their career path after they graduated, along with their current job title and the name of their current employer. Open-ended responses were grouped into themes and/or categories by the researchers using Weft QDA.

Demographic data were collected regarding student's academic major and academic class standing (freshman, sophomore, etc.) at the time of their internship, race and gender.

Results and Discussion

Demographics

Table 1 presents demographic information from the respondents. More female respondents (62.4%) participated in the internship program than male respondents (37.6%). The program primarily attracted upper level undergraduate students with 56.0% reporting they were juniors and 33.3% reporting they were seniors at the time of their internship. In general, a large percentage of the respondents were from STEM disciplines, although there were some from other disciplines. The STEM respondents represented a wide range of majors with a few being highly represented. A higher percentage of respondents represented the following majors: Animal Science (12.8%), Food Science and Human Nutrition (9.4%), Microbiology and Cell Science (7.9%), Family, Youth and Community Sciences (7.9%), Wildlife Ecology and Conservation (7.9%), Agricultural and Biological Engineering (7.2%), Environmental Science (7.2%), Food and Resource Economics (7.2%), Biology (6.5%) and Plant Science (5.8%). The majors highlighted above show there was a moderate percentage of students from non-STEM disciplines (such as Family, Youth and Community Sciences and Food and Resource Economics). The majority of students were White (66.2%), followed by African American/Black (23.7%).

Family, Youth and Community Sciences (7.9%), Wildlife Ecology and Conservation (7.9%), Agricultural and Biological Engineering (7.2%), Environmental Science (7.2%), Food and Resource Economics (7.2%), Biology (6.5%) and Plant Science (5.8%). The majors highlighted above show there was a moderate percentage of students from non-STEM disciplines (such as Family, Youth and Community Sciences and Food and Resource Economics). The majority of students were White (66.2%), followed by African American/Black (23.7%).

Research Internship Experiences

A large number of employers within STEM related fields are likely to employ students that have participated in a STEM related internship program (National Association of Colleges and Employers, 2011); therefore it is important to ensure interns have the appropriate experiences to prepare them for future employment. In order to examine the perceived impact of the FAES internship program, respondents were asked a series of questions designed to gauge their level of agreement with statements associated with their research internship experience (see Table 2).

Over 90% of the respondents agreed or strongly agreed their internship helped them evaluate whether or not they would like to be a researcher and 89.4% agreed or strongly agreed their supervisors improved their knowledge on conducting scientific research. In addition, 75.9% of the respondents agreed or strongly agreed the internship improved their ability to critically think about research reported by the media.

Taken together, these findings confirm studies on internships that have shown they provide students with more insight for deciding the career they would like to pursue (Callanan and Benzing, 2004), improve their skills (Garavan and Murphy, 2001) and improve creative thinking abilities (Bennett-Wimbush and Amstutz, 2011). These results imply that the program improved participants' real world understanding of research. Participants also had positive experiences with the individual they worked most closely with during their internship. This is a positive outcome, since social interaction with faculty can encourage students to remain in their academic programs (Milem and Berger, 1997).

Table 1. Demographics at Time of Internship

Demographic category	%
Gender	
Female	62.4
Male	37.6
Class Standing	
Freshman	0.7
Sophomore	9.9
Junior	56.0
Senior	33.3
Major	
Animal Science	12.8
Food Science and Human Nutrition	9.4
Microbiology and Cell Science	7.9
Family, Youth and Community Sciences	7.9
Wildlife Ecology and Conservation	7.9
Agricultural and Biological Engineering	7.2
Environmental Science	7.2
Food and Resource Economics	7.2
Biology	6.5
Plant Science	5.8
Natural Resource Conservation	5.0
Landscape and Nursery Management	2.9
Forestry	2.9
Other	9.4
Ethnic/Racial Category	
African American/Black	23.7
Asian	5.8
White	66.2
Other	4.3

Table 2. Internship Experiences

Activity	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
The research internship helped me evaluate if research was something I wanted to do more.	2.1	3.5	2.8	26.2	65.2
The individual I worked with most closely during my internship experience was a very good source of quality information related to conducting scientific research.	2.1	3.5	5.0	28.4	61.0
The individual I worked with most closely during my internship experience helped me understand clearly what was expected of me during the internship.	2.1	2.8	9.2	28.4	57.4
The assigned faculty mentor for my internship was very engaged in my project.	4.3	2.9	9.3	27.1	56.4
The internship experience helped me think more critically about research reported by the media.	1.4	5.7	17.0	29.8	46.1

Skills Improvement after Internship Experience

One of the primary goals of the FAES internship program was to improve students' research-related skills. Respondents were asked to indicate their level of competence both before and after their internship experience with 19 research-related skills on a Likert-type scale with 1 = *No Competence*, 2 = *Low Competence*, 3 = *Somewhat Competent*, 4 = *Competent* and 5 = *Highly Competent*. Responses were examined individually and then summed and averaged to create an overall research competence mean score both before and after participating in the internship. When compared, there was a statistically significant positive change between the reported competency level before participating and after participating in the research internship. Table 3 shows the reported levels of competence before the internship, Table 4 shows the reported levels of competence after the internship and Table 5 shows the change in the overall research competence mean scores. Before the research internship, respondents scored an overall level of "somewhat competent" with an average score of 3.49.

After the research internship, this score increased to the "competent" range, with an average score of 4.14. This change was statistically significant at the 0.01 level.

When items were reviewed individually, the largest areas of reported improvement in competence were in the skills for carrying out research and the knowledge of the science literature in their field. Before the internship, on average, respondents indicated an average score of "somewhat competent" in carrying out research and knowing science literature in the field, which increased to an average of "competent" after the internship experience. The skills that had the lowest level of change in competence were listening effectively, speaking effectively and writing effectively. Although the change was low, on average the respondents were already competent in these skills before starting the internship. The outcomes mentioned above show that the internship accomplished its main goal of improving students' research skills. These findings support other studies which have demonstrated the engagement in research as an undergraduate improves students' research related skillset (Lopatto, 2007; Seymour et al., 2004).

Table 3. Reported Competence in Research Areas before the Internship

Activity	NC ¹ (%)	LC (%)	SC (%)	C (%)	HC (%)
Write effectively	0.7	4.3	23.7	51.1	20.1
Speak effectively	1.4	3.6	24.5	53.2	17.3
Listen effectively	0.0	1.5	21.9	54.7	21.9
Solve problems independently	0.7	2.9	40.1	44.5	11.7
Understand ethical implication	0.7	3.6	28.3	53.6	13.8
Understand scientific findings	0.7	18.7	40.3	36.0	4.3
Carry out research	7.9	28.1	49.6	12.2	2.2
Use statistics or math formulas	4.3	18.0	40.3	31.7	5.8
Know literature of merit in the field	8.8	29.2	44.5	16.8	0.7
Analyze literature critically	6.5	26.8	42.0	22.5	2.2
Maintain openness to new ideas	0.0	5.0	16.5	58.3	20.1
Place current issues in historical context	4.3	12.9	38.8	37.4	6.5
Work as part of a team	0.7	2.2	15.8	56.1	25.2
Adapt to changing technology	0.7	2.9	28.5	54.0	13.9
Think logically about complex material	0.0	4.3	45.3	38.8	11.5
Approach problems creatively	0.0	8.6	34.5	48.2	8.6
Synthesize and use information from diverse sources	0.0	12.2	37.4	44.6	5.8
Develop intellectual curiosity	0.7	4.3	34.1	48.6	12.3
Tolerate ambiguity	4.4	14.1	44.4	31.9	5.2

¹NC = no competence, LC = low competence, SC = somewhat competent, C = competent, HC = highly competent

Post-Internship Educational and Career Choices

Two of the primary reasons the FAES research internship program was established was to encourage undergraduate students to engage in science-focused education and pursue STEM careers. In this regard, internships could play a significant role in filling the growing need for graduates with STEM degrees in the US.

Educational Choices

Respondents were asked a series of questions gauging their educational choices after completing their FAES internship experience. First, respondents were asked if they had enrolled in courses they had not previously considered, changed their major, or attended graduate school after engaging in the internship experience. After the internship experience, 33% of respondents took a course they had not previously considered. Most did not change their major (only 3% did) and the majority (64%) attended graduate school (Figure 1). Given that most respondents were either juniors or seniors, it is to be expected that most would not have changed their major. While it is unlikely, as well as difficult, to show that the research internship experience caused respondents to consider graduate school, research

Table 4. Reported Competence in Research Areas after the Internship

Activity	NC ¹ (%)	LC (%)	SC (%)	C (%)	HC (%)
Write effectively	0.7	0.7	12.1	55.3	31.2
Speak effectively	0.0	0.0	13.6	56.4	30.0
Listen effectively	0.0	0.0	6.5	53.2	40.3
Solve problems independently	0.0	0.7	5.7	55.0	38.6
Understand ethical implication	0.0	1.4	10.0	53.6	35.0
Understand scientific findings	0.0	1.4	9.9	51.8	36.9
Carry out research	0.7	0.7	15.0	48.6	35.0
Use statistics or math formulas	0.7	5.7	25.5	48.9	19.1
Know literature of merit in the field	0.7	10.0	20.7	42.9	25.7
Analyze literature critically	0.7	7.1	22.9	50.7	18.6
Maintain openness to new ideas	0.0	0.0	2.8	61.7	35.5
Place current issues in historical context	0.0	6.4	31.4	44.3	17.9
Work as part of a team	0.0	0.0	3.5	43.3	53.2
Adapt to changing technology	0.0	0.0	14.3	52.1	33.6
Think logically about complex material	0.0	0.0	9.9	52.5	37.6
Approach problems creatively	0.0	0.0	14.1	49.3	38.6
Synthesize and use information from diverse sources	0.0	0.7	12.8	51.8	34.8
Develop intellectual curiosity	0.0	0.0	7.2	43.5	49.3
Tolerate ambiguity	1.5	6.6	29.2	41.6	21.2

¹NC = no competence, LC = low competence, SC = somewhat competent, C = competent, HC = highly competent

experiences can help validate students' prior interests in science, research and graduate studies (Seymour et al., 2004). Immersing oneself in a science research environment can help students evaluate their own career interests and whether they are a good match for the unique professional environment of research (Seymour et al., 2004).

Career Choices

Finally, respondents were asked to describe their career path following graduation. Responses included open-ended descriptions of their career path, their current job title and employer and whether or not they are currently working in a science-related field. Respondents were asked to briefly describe their career path after they graduated with their bachelor's degree. The open-ended responses were categorized into four major career trajectories (see Table 6).

The types of employment noted by respondents were categorized into six different categories and included: (a) government or extension work, (b) business or engineering, (c) human services, including teaching, (d) environmental or outdoor type work, such as forestry or park ranger, (e) human or animal health, such as a doctor or vet and (f) working in research or in a lab. The types of graduate programs those currently in graduate school reported being involved in included: (a) pre-professional programs (such as M.D., D.V.M.), (b) Master's program, (c) Ph.D. program and (d) Unspecified graduate program.

Respondents that went directly from their bachelor's degree to employment were primarily those employed in business or engineering. Those who attended graduate school directly upon completion of a bachelor's degree were most likely to be currently working in the human or animal health professions (Table 7).

Respondents employed following their bachelor's degree who later returned for graduate school were most likely to be enrolled in or applying to a Master's degree program (Table 8). Respondents who attended graduate school directly after completing their bachelor's degree were most likely to be currently enrolled in a pre-professional program.

Ten respondents reported they were still currently in their bachelor's degree program and had not yet graduated. Of these ten, five respondents plan on attending graduate school once they finish their bachelor's degree.

Current Employment

When asked, 69% of respondents reported they were currently working in a science related field. Respondents were asked to provide the name of their current employer. Their responses were grouped into major categories that can be seen in Table 9. The most common type of employer was a university ($n = 26$) followed by the government ($n = 18$).

Table 5. Mean Change in Research Competency Level Before and After Internship

	M Before (SD)	M After (SD)	M Change (SD)
Overall Research Competence	3.49 (.49)	4.14 (.45)	.66** (.45) ¹

¹Mean change assessed through dependent *t*-test, ** $p \leq .01$.; Competency was assessed on a 5-point Likert-type scale of 19 total items with 1 = No Competence, 2 = Low Competence, 3 = Somewhat Competent, 4 = Competent, and 5 = Highly Competent.

Figure 1. Educational choices students made after completing the internship.

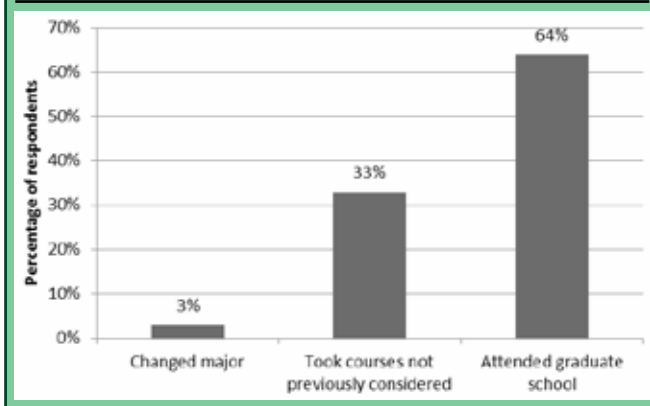


Table 6. Career Paths Chosen after Graduating with a Bachelor's Degree

Career Paths	Number of Respondents (%)
Employed following graduation and still working	39 (35.8)
Attended graduate school immediately following graduation and still in graduate school	26 (23.9)
Attended graduate school after graduation and now currently working	25 (22.9)
Employed following graduation, now attending or applying to attend graduate school	19 (17.4)

Table 7. Career Paths for those Currently Working

Career Path	Employed following graduation, still working (number of respondents)	Attended graduate school after graduation, currently working (number of respondents)
Business or engineering	12	3
Environmental/outdoors	7	5
Government/extension	6	4
Human or animal health	2	8
Human services	9	3
Research or lab work	3	2

Table 8. Career Path for those Currently in Graduate School

Career Path	Employed following graduation, now attending or applying to graduate school (number of respondents)	Attended graduate school after graduation, currently in graduate school (number of respondents)
Pre-professional program	4	13
Master's program	7	4
Ph.D. program	4	6
Unspecified program	4	3

Table 9. Current Employer

Current Employer	Number of Respondents
University	26
Government	18
Medical Company/Hospital	11
Agricultural/Natural Resource Company	9
Animal Company or Veterinarian	9
School (non-university) or Human Services	9
Private Company- Other	8
Self Employed	5
Unemployed	4
Technology Company	3

Table 10. Current Profession

Current Job Title	Number of Respondents
Student	19
Technician/Scientist	14
Teacher, Instructor, or Professor	10
Medical Doctor, Clinician, or Nurse	9
Engineer	6
Counselor or Therapist	5
Veterinarian	4
Research Assistant/Associate	4
Unemployed/Stay at home parent	4
Sales Manager or Leader	3
Analyst	3
Post Doc Researcher	2
Extension Agent	2

Respondents were then asked to describe their current job title. Similar job titles were categorized and can be seen in Table 10. The most common job titles were student ($n = 19$), technician/scientist ($n = 14$) and teacher/instructor/professor ($n = 10$).

Summary

The researchers acknowledge there are limitations to the research, including a lack of a control group. As a result, the changes identified in the results may be due to external circumstances and not just participation in the internship experience. However, questions were framed to try to extract changes respondents felt were attributable to their internship experience. The results of this study suggested that hands-on research experiences at the undergraduate level improved the respondents' self-reported research-related skillset. These findings support the notion that learning environments offering direct contact with and applicability of, research concepts will encourage deeper learning and transfer of skills (Beard and Wilson, 2006; Lamm et al., 2011).

In addition, while career choices cannot be directly associated with participation, a majority of the research internship participants chose to work in science-related field after graduation. They also were likely to have jobs with universities or government and 68% went on to graduate school and/or pre-professional school.

Since these findings could indicate that the hands-on research experiences helped foster efficacy in the development of research-related skills, STEM faculty may find it useful to encourage their students to engage in these research activities. Furthermore, the research experience encouraged students to engage in courses they would not have otherwise considered, leading to further development of STEM related knowledge and potential application of that knowledge in their future careers. These findings also support Kolb's theory of experiential learning, in that students learned about research in a hands-on way in which they were asked to directly apply their learnings in the fields, labs and other settings in which they were engaged. An important piece of experiential learning theory is the impact of hands-on learning and positive personal experience on future engagement in that activity (Baker et al., 2012; Kolb 1984; Roberts, 2006). Their self-reported change in research skills and their high engagement in graduate

school and specialized careers could indicate they were able to use what they learned during their internship again in future situations.

To further understand the impact of research internships on future career trajectory, a study should be conducted that uses a control group of students that were similar to research intern participants but not engaged in an internship, so that findings related to research skill growth and future career choices could be compared. Additionally, further studies could explore the relationship between research internship experiences and the psychological impact on students' confidence and feelings of efficacy towards becoming part of the future scientific community. Past research has indicated undergraduate research experiences and in particular, relationships with faculty, can inspire students to become part of the scientific community (Hunter et al., 2007). In addition to research skills, students could be asked to describe their socio-emotional experiences and whether those experiences reaffirmed or changed their perceptions of themselves and their potential for STEM-focused careers and/or graduate studies.

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The Feasibility of Implementing an Equine-Assisted Activities and Therapy Curriculum into Higher Education¹

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Abstract

Increased research on the benefits of equine-assisted activities and therapies (EAAT) for people with special needs and the success of these programs has generated an increase in education on EAAT in the United States. This study provides evidence of the viability of EAAT programs in higher education and helps determine whether universities and colleges should consider implementing these programs into their curriculum, with particular focus on Murray State University. Three surveys sent to Community EAAT programs, Higher Education EAAT programs and Special Education Administration of western KY counties showed a large difference in operational costs between Community EAAT programs and Higher Education EAAT programs. Higher Education EAAT programs reported an employment rate of 58% of graduates going into the EAAT field. Community EAAT programs reported valuing education more than experience when hiring employees and Special Education Administration had a strong belief in the positive effects of EAAT but reported that very few of their students with special needs were participating. Creating an EAAT program at Murray State University could provide the education preferred by employers for those interested in teaching EAAT and possibly increase the number of students with special needs in the western KY area that participate in EAAT.

Introduction

Very few higher education institutions have an EAAT program to complement their equine program, despite the many documented benefits of EAAT (Scott, 2005). Even with numerous occupational therapy, clinical psychology, occupational safety and health and special education programs, there is very little mention of EAAT as an alternative. With increasing inquiries from prospective students visiting Murray State University as

well as the interest by current university students (Porr, C.A., personal communication), it may be a beneficial subject to teach in higher education institutions, specifically Murray State University.

In order for an EAAT program to succeed at the university/collegiate level, there must be a demand among students to learn this type of curriculum. Research has been conducted on the effects of Principles of Therapeutic Riding curriculum on students at Texas Tech University. Results indicated that after students had been through the curriculum, they had a greater understanding of disabilities and what families who have children with special needs face daily (Cepica, 2005). These students also had an interest in continuing in this program or another community service based learning program. This research indicates there is student interest in the subject.

Equestrian programs at the university/collegiate level are costly to operate. A study conducted at William Woods University explored the potential of adding an EAAT curriculum to a current equine program in order to generate additional income to support the existing program. From this research, a proposal was created and EAAT curriculum implemented that required community service from the students and also increased program revenue (Mullen, 2010). Due to the goals and needs of EAAT curriculum, many colleges and universities are redesigning their general curriculum to target specific skills needed for the job market (Phillips et al., 2008). Other useful research that has been conducted includes the study of the role colleges and universities play in the education of EAAT professionals. The Professional Association of Therapeutic Horsemanship International (PATH Intl.) is considered the premier organization that promotes EAAT for individuals with special needs in the United States. Petitto (2010) found that some PATH Intl.

¹This study was deemed exempt by the Murray State University Institutional Review Board

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centers were partnered with a university or college in a variety of ways including internships, partnerships, shared facilities, or as research collaborators.

These studies support the positive potential of implementing an EAAT program at the university/collegiate level, but more research needs to be conducted to evaluate the cost, public demand and success of existing EAAT programs in higher education. Therefore, the objectives of this study were 1) to assess the expenses associated with operating an EAAT program in the community as well as the cost of teaching EAAT program curriculum at the university/collegiate level; 2) to evaluate what EAAT programs in the community value when hiring employees; 3) to assess information on how EAAT programs in the community and at the university/collegiate level are established and operated; and 4) to evaluate the demand for an EAAT program at the university/collegiate level in Western Kentucky by special education administration.

Methods

This study was conducted using three separate surveys which were administered electronically using a Qualtrics survey instrument. The first survey, Community EAAT Programs, was sent to 10 private EAAT programs in the southwestern Kentucky community to assess their operating costs, attendance levels of clients and volunteers and how they rank experience versus education when hiring. The second survey, Higher Education EAAT Programs, was sent to 10 university/collegiate EAAT program instructors to determine their operating cost, number of students enrolled, employment rates of graduates, the steps taken to implement their program and the success of their programs to date. The third and final survey, Special Education Administration, was sent to special education administration of 10 southwestern Kentucky counties. This survey evaluated the board member's perception of EAAT, the number of students enrolled in EAAT programs and how much money, in dollars, they thought their students would be willing to pay for a 1-hour EAAT lesson. These surveys were first administered via e-mail in October of 2013 after speaking to each recipient on the phone. Two months later, in December, a follow up e-mail was sent to address any questions and encourage those who had not responded to complete the survey. Survey questions included descriptive text, Likert-type scale, multiple choice and graphic slider formats. Given the small population assessed, the small number of scaled instrument items and the exploratory, descriptive nature of this work, researchers relied on holistic, qualitative assessment by a panel of experts to determine reliability (Cronbach and Shavelson, 2004), content validity and face validity (Fraenkel and Wallen, 2006).

Results and Discussion

Considering the difficulty in contacting recipients, the response rate of the surveys was relatively good. Results from the Community EAAT Programs (n=10

total responses, 100%) showed costs ranging from less than \$10,000 to over \$800,000/year (n=7) to operate the program, with the number of clients ranging from 25-150 per week. This is drastically different from Higher Education EAAT Programs (n=8 total responses, 80%) which reported operational expenses ranging from less than \$50,000 to over \$300,000/year (n=5). The large difference in operating costs could be due to the fact that not all Higher Education EAAT Programs had their own facilities and horses. Many of them taught lecture classes and then partnered with a Community EAAT Program for the hands-on learning portion of the course. This eliminates extra expenses for building maintenance, insurance and horse care. Future research should identify the expenses reported by respondents in the survey.

Respondents from the Community EAAT Programs were asked to rank how they value experience compared to education when hiring on a scale of 0-10 (0=experience, 10=education). Figure 1 reveals that the general consensus leaned more toward favoring education over experience. Comments within this survey expressed the need for the EAAT industry to hire more graduates of this type of program, suggesting a need for more educated personnel. Not only does an EAAT program at the university/collegiate level have the potential to provide more educated employees, but it could also provide more volunteers that are essential to supporting the industry. Figure 2 portrays the volunteer versus client information from the 10 Community EAAT Programs surveyed. It is important to note that 30% of respondents reported a need for more trained volunteers and only 20% reported having more volunteers than they needed in order to operate.

Higher Education EAAT Programs (n=8 total responses, 80%) reported the average employment rate of students graduating from these programs into the EAAT field was 58%. Six out of the eight schools surveyed reported grants and donations as a source of income to fund their EAAT program and two out of the eight charged their students course fees. Table 1 por-

Figure 1. Community EAAT Programs Valuation of Experience vs. Education When Hiring

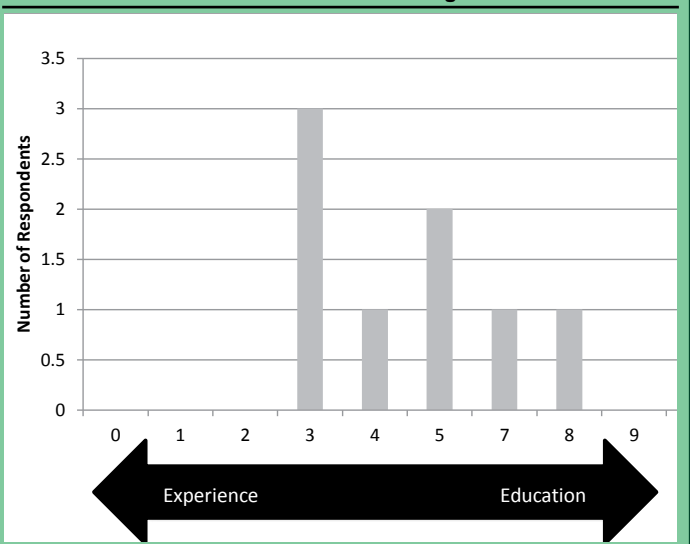


Figure 2. Community EAAT Program Client vs. Volunteer Information

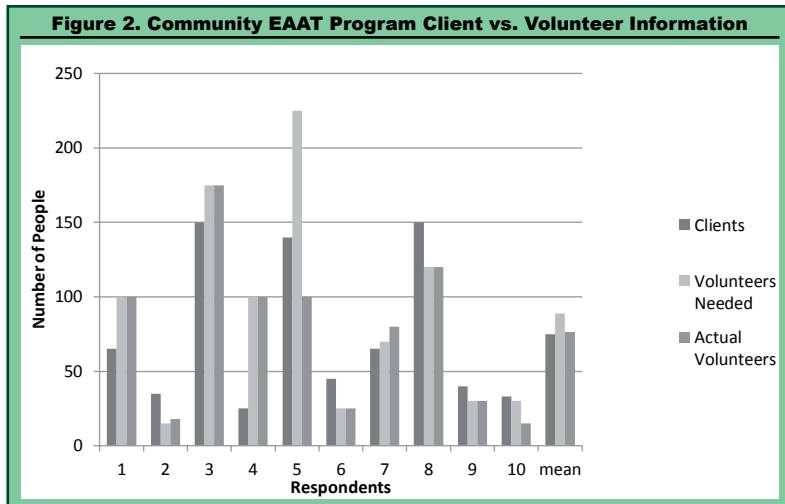


Table 1. Number of Students Enrolled in Education EAAT Programs (n = 8)

Respondent	Undergraduate Students	Graduate Students
1	50	10
2	20	N/A
3	10	N/A
4	75	5
5	15	1
6	15	8
8	N/A	15

Notes: N/A= The program is not available to that category of student.

trays enrollment numbers of the Higher Education EAAT Programs. It is important to note that some programs offered their curriculum to either undergraduate students or graduate students, not both. This could be due to the fact that some graduate programs offered PATH Intl. certification in addition to the graduate degree, whereas undergraduate programs do not. PATH Intl. certification requires 25 hours of teaching two or more individuals with disabilities, which may have been more easily incorporated into a graduate curriculum (PATH Intl., 2014).

Special Education Administration (n=8 total responses, 80%) respondents showed great belief in the positive effects of EAAT on a ranked scale (average 7/10), but they reported that only 2.5% of special education students in the eight Kentucky counties were currently participating in EAAT. When asked why they thought students did not participate in EAAT, the top two reasons were lack of money and lack of transportation. The average cost that administration thought students would be willing to pay for a 1-hour equine assisted therapy lesson was \$12.14 with values ranging from \$0-\$30. This is in conflict with current fees charged by Community EAAT Programs, which generally range from \$45-\$125 per hour. This makes it particularly difficult on families because insurance normally only covers equine assisted therapy with a licensed/credentialed professional and will not cover equine assisted activities without an occupational therapist, physical therapist, social worker, etc. (Johnston, 2013). The difficulty is only compounded when the transportation barrier is considered.

Summary

Overall, results indicated a positive understanding of the benefits of EAAT, a need for students in Kentucky school systems with special needs and a great assertion of the need for graduates in this field. Colleges and universities could use the information assembled from this study to decide whether or not they should add an EAAT program to their curriculum. This type of curriculum would likely require alliance with PATH Intl. and involve a selection of courses from the area of equine management, physical therapy and psychology. This alliance could come from the Higher Education Membership PATH Intl. offers for colleges and universities wanting to educate students in EAAT. This could also open more collaborative opportunities between departments within a given institution. More research should be conducted on the sources of funding for creating and sustaining an EAAT educational curriculum, as well as research on the barriers of people with special needs not being able to participate in EAAT.

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Internationalization of Programming at New Mexico State University¹

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Abstract

As globalization has increased, agricultural faculty have been encouraged to internationalize their programming efforts. The purpose of this study was to assess the attitudes of agricultural faculty at New Mexico State University (NMSU) towards globalizing their programming efforts. Current international programming efforts and barriers to participating in these efforts were assessed. The results showed that 85% of respondents were involved in international activities within the past ten years. Many, however, have not participated in these activities within the past year indicating that it is not an ongoing component of their work. The mean attitude score of NMSU agricultural faculty towards global issues was 2.93 in a scale from one to four, with four being the most positive. Teaching faculty and faculty over the age of 50 reported more participation in international activities and a more positive attitude toward international issues than their colleagues. The primary barriers towards globalizing programming efforts were "Lack of Financial Support," "Lack of Time," and "Not a Programming Priority." These results were consistent with the attitude section, which showed that respondents did not consider it a priority that was rewarded or communicated effectively.

Introduction

In 2002, The Extension Committee on Organization and Policy (ECOP) published a report that listed the "Impact of Globalization" as one of the six major challenges currently facing the extension system. ECOP asserted that the Extension Service must be a leader in a world that is becoming more globally interdependent. The National Association of State Universities and Land Grant Colleges (NASULGC), (now the APLU), released a strategic vision statement for Land Grant Colleges in May of 2000. In this vision statement, NASULGC contends that the United States higher education sector needs to produce leaders for the 21st century that are capable of understanding current challenges and influence the direction of the global community.

Agricultural faculty have been encouraged to internationalize their efforts for over 30 years. Land Grant Universities and the CES have a unique role to play in a globalizing world. According to Ludwig and McGirr (2003), the CES can help Americans deal with the issues associated with globalization and assist in forming the view that Americans have of other cultures. Our universities and the CES are in a position to educate leaders about a global market, international trade agreements, cross-cultural skills and global responsibility.

In 1989, the United States Department of Agriculture put forth a document entitled Global Perspectives for Extension. This document discussed the shrinking effect of globalization and stated the importance of global competency for agricultural faculty. In addition, goals were put forth for the integration of international perspectives into all programming development (Ludwig, 1993).

In order to remain relevant in a quickly changing global climate, globalization is becoming increasingly important to the Land Grant Extension mission. In 1993 and 1996, Ludwig conducted research that revealed the need for Extension staff to undergo globalization training. As numerous needs arise due to globalization, agricultural faculty must be ready to deliver appropriate information to answer this need. Ludwig also proposed that it is important that Extension faculty receive cross-cultural training to learn sensitivity to the needs of other cultures as members of our global community.

Although the goal of internationalizing has been mandated by ECOP and NASULGC (APLU), NMSU has not formally documented the extent of interest, participation and attitudes of NMSU faculty and staff toward internationalizing. The purpose of this study was to assess the attitudes of agricultural faculty at NMSU toward globalizing their programming efforts. This study was conducted to address the following research questions:

- To what extent are agricultural faculty engaged in globalizing their programming efforts?

¹The New Mexico State University Institutional Review Board approved the study protocol and all participants voluntarily participated in this survey research.

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- What are the attitudes of agricultural faculty toward globalizing programming efforts?
- To what extent are the previously mentioned attitudes and behaviors related?
- What are the perceived barriers towards globalizing programming efforts?
- What is the relationship between select antecedent characteristics and engagement in globalizing programming efforts?

Methods

The population for this study includes all agricultural faculty at New Mexico State University. The frame for this census study was obtained from the Dean's office at NMSU in order to compile a complete and updated list. The final usable population in the frame was N = 231.

The survey instrument used in this study combined sections that were developed and used by Barbara Ludwig in 1993 and 1999 and by Edwin Lewis in 2006 on the Ohio State Cooperative Extension Service and the Virginia State Cooperative Extension Service respectively. The instrument was reviewed and slight modifications were made, based on the assessment of a panel of experts.

The electronic instrument contained four sections including demographic information, current involvement in international activities, attitudes towards international issues and barriers towards internationalizing programming efforts.

The employee profile solicited information about the respondents including gender, age and current position. This data was collected to determine if position or previous experience is an indicator of international programming interest.

The level of participation in international activities of the respondents' was assessed by using 14 questions developed by Ludwig (1999) and modified by Lewis and Gibson (2006) that itemize 14 different types of activities. By calculating the number and percentage of respondents' participation in these activities over an eight-year period, Ludwig was able to employ this information to characterize their level of engagement in international activities.

Respondents in this study were asked to describe their engagement in international activities by choosing the most appropriate option that best describes them. Each response was assigned a value to allow a mean score to be calculated for each respondent. The options included:

- 4 = Done in the past 12 months
- 3 = Done more than one year ago, but less than five
- 2 = Done more than five years ago
- 1 = Have never done

Mean scores were also calculated by job category in order to identify if differences exist in the amount or types of activities in which respondents are engaged.

A Likert-type scale was used to determine the attitudes of respondents toward global issues. This was

used to determine the level of interest in incorporating an international dimension to their programming efforts. Scores were on a four-point Likert scale, with four indicating the most positive attitude and a one indicating the most negative value. The respondents had the following options to choose from:

- 4 = Strongly Agree (SA)
- 3 = Agree (A)
- 2 = Disagree (D)
- 1 = Strongly Disagree (SD)

A mean attitude score was determined for each respondent in the study. The scores of participants were compared by job category.

The participants were asked to identify potential barriers to their involvement in future international programming efforts. This section identified the top barriers to incorporating an international dimension into programming efforts. A list of fifteen potential barriers based on the items used by Barbara Ludwig (1999) and revised by Lewis and Gibson (2006) was used. The participants were asked to identify the three barriers that were most likely to prevent them from incorporating an international dimension into their programming efforts.

The validity and reliability of this instrument was assessed. In 1999, Ludwig reported that a panel of experts from the College of Food, Agriculture and Environmental Sciences (at The Ohio State University) established the content validity of the instrument used in this study. A panel of experts at NMSU also reviewed the final instrument for this study and established the content validity of this instrument. Cronbach's alpha was used to determine the degree of internal consistency in this study. The Cronbach's alpha scale is between 0-1 and as the number increases, the instrument is more reliable. The coefficient for this instrument as conducted by Lewis and Gibson (2006) was 0.87. The reliability score was also tested post hoc resulting in a coefficient of 0.89.

A modified Dillman's (2007) Tailored Design Method was used to collect data using an electronic survey. Dillman (2007) stresses the importance of follow-up activities in order to increase the response rate of the survey. Two follow-up efforts were made with non-respondents.

According to Babbie (1990), a 50% response is considered sufficient for analysis and reporting. A 60% response rate is considered good and 70% is very good. The response rate for this study was 54%.

The data collected from the survey was analyzed using Microsoft Excel and the statistical software SAS. Many statistical techniques were used, which included the derivation of frequencies, means, percentages, standard deviations and t-tests. Information on employee background was analyzed by calculating frequencies and percentages. International programming efforts were analyzed by calculating the means and frequencies of the response scores. A four-point Likert scale was used to measure attitudes of faculty toward internationalizing

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their programming efforts. The responses were summed and the mean scores were calculated for all respondents. A t-test assessed non-responder error and determined if differences exist between faculty members based on select antecedent characteristics. Bivariate regression analysis was employed to measure the correlation between the attitudes and behaviors of the respondents.

Results and Discussion

Research Question 1: To what extent are agricultural faculty engaged in globalizing their programming efforts?

Eighty-five percent of respondents reported involvement in at least some international activity within the past ten years. Respondents were asked to choose from four options Table 1 describes these activities by frequency and mean. A mean score is given for each of the international activities included in the survey. The most frequently selected activity was “exchanged ideas by email or phone with a colleague in another country” (mean 2.18), followed by “hosted an international visitor” (mean 2.89). The activities selected least frequently were “taught at an overseas institution” (mean 1.79) and “assisted in the creation of an Extension program based on international issues” (mean 1.33). The mean scores indicate that most of the activities, on average, were not performed within the past twelve months.

The results of this study show a high level of participation in international activities by NMSU agricultural faculty, however, much of this participation has not been within the past year. These results demonstrate that although it is something that is valued by NMSU agricultural faculty, it is not something that is necessarily an ongoing component of their work. One conclusion to be drawn from this is that although it is part of the mission of NMSU to be involved in global activities, there is not a system in place to provide incentives and opportunities for faculty to be regularly involved in these activities. Many faculty continue to be involved in these activities through altruistic motives, even though it is not a requirement for their position. These opportunities may arise circumstantially for faculty members as they meet colleagues at conferences and other events and become involved in these activities, as opposed to planned international activities through NMSU.

Research Question 2: What are the attitudes of agricultural faculty toward globalizing programming efforts?

To determine the attitude scores of agricultural faculty, a survey was developed using a Likert scale. Thirty-two questions were asked in this section, which covers a range of issues related to globalization. The overall mean score for attitudes was 2.93. This score is close to the “Agree” score of 3.0 in the Likert scale

Table 1. Involvement in International Activities

Activities	N	Percent	Mean	Std Dev
Exchanged ideas by e-mail or phone with a colleague in another country	93	74.4	2.18	1.20
Hosted an international visitor	70	56	2.89	1.28
Served as a communication link between people from different countries	69	55.6	2.40	1.35
Advised an international student	68	54.8	2.20	1.29
Joined or maintained membership in an international organization in your field	64	52	2.38	1.37
Subscribe to international publication	62	50.8	1.57	0.97
Involved clientele in an international activity	61	52	2.30	1.40
Assisted in the development of curriculum materials incorporating international issues	60	48.8	2.44	1.46
Collaborated in an international research project	56	45.2	2.13	1.27
Participated in an international development project	46	38	1.40	0.88
Participated in an international study tour	39	31.7	1.75	1.10
Assisted in the creation of an Extension program based on international issues	25	20.3	2.02	1.25
Taught at an overseas institution	25	20.3	1.33	0.72
Other involvement	34	27.2	1.79	1.19

Note. Done in the past 12 months = 4; Done more than one year ago, but less than five = 3; Done more than five years ago = 2; Have never done = 1.

and indicates an overall positive attitude of the NMSU agricultural faculty towards international issues and globalizing their programming efforts. A mean score for each of the four attitude dimensions was obtained. NMSU faculty’s attitude toward “other cultures” was the most positive of the four dimensions, with a mean score of 3.10. This is very significant because it shows respect for other cultures around the world. As a school that exists on an international border and in a tri-cultural state (Caucasian, Latino and Native American), the positive attitude score of agricultural faculty at NMSU is closely tied with their respect for people of other cultures. The lowest score was “international trade” with a mean score of 2.84

The lowest three variable scores in “faculty involvement in global education,” were the variables that had to do with faculty being rewarded at NMSU for global efforts, expectation by leadership to globalize and the need to focus on local problems. The low mean score for this last variable shows that faculty think that they should not only focus on local problems, but should also be involved in global education. It is very clear from the high mean scores in this dimension that NMSU faculty recognize that a global dimension should be incorporated into their programming efforts. However, the low scores concerning leadership expectations and rewards for international involvement reveal that this priority is not being communicated effectively by leadership or promoted through the tenure or promotion system.

Research Question 3: To what extent are the previously mentioned attitudes and behaviors related?

There was a very weak relationship between the attitudes and behaviors in this study. The R-square number obtained means that only 28% of the variance in behavior is explained by attitudes.

Although the results show that attitude has some degree of influence on behavior, the amount of influence

is very weak. This is significant, because the overall mean attitude score of NMSU agricultural faculty towards international activities was 2.93. This is a positive attitude score, but the influence of this overall positive attitude on behavior is fairly low which is seen in the lack of participation in international activities in recent years. This suggests that there are other unknown factors influencing their behavioral choices.

Research Question 4: What are the perceived barriers towards globalizing programming efforts?

Participants were asked to choose the top three barriers that they felt were limiting them from participating in more global programming from a list of 15 common barriers. The top barrier listed was “Lack of Financial Support” with 67.8% of respondents listing this as a barrier. The next most common barrier was “Lack of Time” with 55.7% of respondents listing this as a barrier towards globalizing their programming efforts. The third largest barrier was “Not a Programming Priority” and was listed by 47.8% of respondents. These results reflect the results of the attitude section, which showed that respondents felt like it was not a programming priority that was communicated effectively or rewarded.

The three barriers listed the least were “Lack of Support from Colleagues” (0.9%), “Fear of Negative Career Impacts” (3.5%) and “Lack of Materials” (3.5%). A list of the barriers and the frequency of their selection is listed in Table 2.

Barriers	N	Percent
Lack of Financial Support	78	67.8
Lack of Time	64	55.7
Not a Programming Priority	55	47.8
Language Skills	39	33.9
Family Commitments	30	26.1
Lack of Expertise	20	17.4
Lack of Support from Administration	18	15.7
Not Rewarded in Annual Performance Appraisal	12	10.4
Lack of In-Service Training	10	8.7
Not Recognized in Promotion Criteria	9	7.8
Lack of Support from Local Clientele	7	6.1
Cultural Barriers	6	5.2
Fear of Negative Career Impacts	4	3.5
Lack of Materials	4	3.5
Lack of Support from Colleagues	1	0.9

The results of this section of the study are consistent with Lewis and Gibson (2006) and Ludwig (1999). Lewis and Gibson found that “Lack of Financial Support” and “Not a Programming Priority” to be the top barriers to involvement in global activities at Virginia Tech and Ludwig found that “Lack of Time” and “Not a Programming Priority” were the top barriers at Ohio State. These similar results show that resources of time and finances are usually limited for faculty at Land Grant Universities. However, “Not a Programming Priority” was the only barrier listed in the top in all three studies, which shows that there is a lack of communication by the leadership in stating this as a priority as has been mandated by the APLU.

Research Question 5: What is the relationship between select antecedent characteristics and engagement in globalizing programming efforts?

The fifth research question sought to identify if there was a relationship between engagement in globalizing programming efforts and certain demographic or employment characteristics. The first relationship explored was whether age affected faculty attitudes toward global programming. The t-test procedure was used to compare respondents who were fifty and older to respondents who were under fifty. Respondents fifty and over scored significantly higher than their younger counterparts in areas regarding international trade and other cultures, based on a 95% confidence level. These results suggest that faculty over the age of fifty are at a different place in life than their younger colleagues which has significantly affected their attitudes toward international issues. Respondents over fifty are likely to have had more travel opportunities and consequently more exposure to other cultures which could have led to a more positive attitude score in this dimension. As noted previously, faculty do not see international activities as something encouraged in the promotion and tenure system, or through any other rewards (financial, recognition, etc.). This could be the reason why many of the faculty members under fifty, who are less likely to have attained tenure, score lower in the attitude dimensions. They are not encouraged to be involved in these activities and consequently their limited exposure leads to a lower attitude score.

In addition to the attitude dimensions, a t-test was performed to determine if there is a difference in behavior between agricultural faculty over fifty years old as compared to their younger colleagues. The p value found was 0.004*, which shows a significant difference between older and younger faculty members concerning behavior. Faculty over fifty were significantly more likely to have participated in international activities than faculty under fifty. This shows more exposure to other cultures, which could affect their attitudes towards global issues. Respondents under 50, in addition to being busier with working towards tenure, are generally more likely to have children at home. This means that they may have more family obligations and less time to participate in international activities.

Teaching faculty were compared to Extension and Experiment station faculty to determine if they scored higher with regards to attitude and behavior as well. Teaching faculty scored significantly higher than their colleagues with regards to items dealing with assistance to less developed countries, but there was no significant difference in other areas. Additionally, teaching faculty scored significantly higher concerning behavior. The reason for this could be that they are more likely to have exposure to international students and international activities working on campus than their colleagues who are working in rural areas. They also may have more opportunities available to them to participate in these

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activities for research or through meeting colleagues at conferences who are involved in these types of activities. Additionally, teaching faculty may have more time to participate in these activities due to their block schedule. During the summers they are teaching less, which may give them more time to participate in international activities.

Summary

The findings of this study demonstrate a high level of participation in international activities at NMSU, but there are not extrinsic incentives for participation in these activities provided by the University. The attitude of agricultural faculty at NMSU towards international issues is very positive, but they do not see involvement in international activities as something that is expected of them. There is a lack of direction from leadership on whether international activities should be a programming priority and at what level this should be a priority. There are not clear standards for participation in international activities and there is very little training provided in this area. Lack of time and financial support are the two barriers listed the most by respondents in this study, demonstrating that if the leadership at NMSU recognizes this as a programming priority, they need to provide the resources for faculty to be able to participate in these activities. There is also a need for guidance in setting priorities about what level of importance this should be given.

Finally, participation in international activities leads to a more positive attitude towards international issues. This in turn could lead to more participation in these activities. It is important that agricultural faculty at NMSU have the opportunity to participate in cross-cultural activities as this leads to further participation in these activities.

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Associations between Learner Interaction and Achievement in an Online Course: A Longitudinal Study¹

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Abstract

This study analyzed student interaction in an online graduate-level research methods course for students majoring in agricultural education and related disciplines. The study involved 117 students and data were collected over 5 years. Overall there were 54 comparisons between groups of students who earned grades of B+ or lower and groups who earned grades of A- or A. In 45 of these comparisons, the average number of interactions for the A- or A groups exceeded the average number of interactions for the B+ or lower groups. In every comparison, the A- or A groups had a higher mean for number of sessions, total time in minutes, discussions read, and content files viewed than the B+ or lower groups. Pearson correlations were used to describe the associations between interactions and students' final percentage grade. Number of sessions, total time in minutes, discussions read, and content files viewed were positively correlated with achievement in each of the 5 years studied. Effect sizes for specific interactions varied significantly by year.

Introduction

Online learning has exceeded the overall growth rate for higher education for more than a decade (Allen and Seaman, 2014). According to Allen and Seaman, 7.1 million students took at least one online course in 2013. Draves and Coates (2007) predicted that in this century half of all education will be online. Online learning offers many advantages over traditional classroom instruction (Draves, 2002). One advantage is that course management systems automatically collect data on the extent to which students interact with course materials, the instructor and other students. An opportunity exists to mine this data for clues on how to enhance teaching and learning online.

This study was framed by Kearsley and Shneiderman's (1998) engagement theory. *"The fundamental idea underlying engagement theory is that students must*

be meaningfully engaged in learning activities through interaction with others and worthwhile tasks" (para. 1). This theory is especially applicable to online learning. It emphasizes student collaboration and authentic projects. The theory provides for interaction with content and places special emphasis on human interaction. Students identify class projects to capitalize on their intrinsic motivation for learning.

Engagement theory emphasizes interaction, and interaction is widely believed to be important in online learning. Different forms of interaction are routinely included on lists of best practices for teaching online. One nationally recognized example is the Quality Matters rubric, which includes eight standards for online courses. The fifth standard is "Course Activities and Learner Interaction" (Maryland Online, 2014, para. 5). Moore (1989) operationalized interaction to include three types: learner–content, learner–instructor, and learner–learner. Learner–content interaction involves students' interaction with course materials and related concepts and ideas (Swan, 2003) and "is a defining characteristic of education" (Moore, 1989, p. 2). Learner–instructor interaction involves any of the ways the instructor communicates with students to facilitate learning (Swan, 2003). Learner–learner interaction may include formal communications such as debates, discussions, and peer review as well as informal communications (Swan, 2003). Swan argued that each type of interaction supports learning and that the three types are interconnected. Swan presented a Venn diagram that placed learning at the intersection of learner–content, learner–instructor, and learner–learner interaction.

Studies involving online courses have shown that some measures of interaction correlate positively with grades. For example, Pratt-Phillips (2011) discovered a positive relationship between student grades in an equine science course and number of online sessions, files viewed, and time online. Syler et al. (2006) concluded

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that use of web-based course tools significantly impacted freshman and sophomore students' performance in a computer information systems class. Wang and Newlin (2000) reported significant positive correlations between student grades and home-page hits, posts read, and posts written in a web-based psychology course.

Attending class and devoting time to learning are important measures of overall engagement and make learner–content, learner–instructor, and learner–learner interaction possible. Studies (Devadoss and Foltz, 1996; Marburger, 2006; Romer, 1993) in economics have demonstrated a strong, positive relationship between class attendance and academic achievement. Research from the 1970s demonstrated that time on task was positively associated with learner achievement (Stallings, 1980). Resnick (2007) confirmed the link between time and learning but also pointed to the importance of using time in a manner that most effectively promotes learning. Though much of the research on class attendance and time on task were not done in the context of online learning, there are online equivalents. Students attend online classes by signing into a course management system. These systems can track how often students log in, where they go within the course, and how long they remain online. Pratt-Phillips's (2011) study offers support for the impact of attendance and time in an online setting.

Prior studies suggest that overall engagement and interaction have a positive influence on learning. However, the scope of this work is not sufficient to make generalizations across a variety of students and subject areas. As a result, Roberts et al.'s (2005) recommendation that research be conducted to determine how much interaction is taking place and how much is needed remains relevant.

Purpose

The purpose of this study was to analyze student interaction in an online graduate-level research methods course. The study had two objectives:

1. Describe student interaction by grade group and year.
2. Describe associations between specific interactions and final percentage grade by year.

Methods

This study was deemed exempt by the Iowa State University Institutional Review Board.

The population was 117 graduate students enrolled in an online research methods course taught over a 5-year period from 2008 to 2012. This timeframe was selected because it was the most recent 5-year period during which the course management system generated data that were comparable over time. The course was taught once each year during the spring semester. The population included 51 males and 66 females. Most students majored in agricultural education (n=71), followed by professional agriculture (n=36), undeclared (n=7),

horticulture (n=2), and seed technology and business (n=1). To address the first research objective, students' final percentage grades in the course were used to form two groups. The first group consisted of 59 students who earned grades of B+ or lower. The second group consisted of 58 students who earned grades of A- or A. Table 1 shows the number of students in each grade group by year.

Although updates were made to the course over time, the overall instructional design remained consistent. The following description is based on the course as delivered in the spring of 2012 and is a fair representation of how the course was conducted in each of the 5 years covered by this study. Web-based tools used in this course included course content, assessments, calendar, discussions, e-mail, syllabus, roster, and "my grades." Lessons included a list of objectives and a list of activities to support learning. These activities incorporated reference to the appropriate chapters in the required textbook, links to related materials and assignments, and audio presentations of content with accompanying slides. There were 18 discussion areas including one each for general discussion, students only, anonymous course feedback, and midterm course evaluation. The remaining 14 discussion areas were used to facilitate submission of and feedback on assignments. Evaluative feedback on assignments was posted by the instructor and by students as public threaded discussions. Students were encouraged to use e-mail within the course management system for all course-related communications except messages to everyone in the course. In such circumstances, students were encouraged to use the discussion tool. The calendar was used to remind students of important deadlines and provided links to assignments, weekly lessons, assessments and discussion areas.

Student grades were based on an interview of a professor in their discipline (5%), human subjects in research training (5%), application exercises (15%), proctored examinations (50%), and a research proposal

Table 1. Sample Sizes by Grade Group and Year

Year	Grade group		Total
	B+ or lower	A- or A	
2008	15	13	28
2009	14	10	24
2010	12	9	21
2011	10	14	24
2012	8	12	20
All	59	58	117

Table 2. Specific Interactions and Types of Interaction Tracked for this Study

Interaction	Type of interaction		
	Learner–Content	Learner–Instructor	Learner–Learner
Number of sessions	X	X	X
Total time in minutes	X	X	X
Discussions posted	X	X	X
Discussions read	X	X	X
E-mail messages sent		X	X
E-mail messages read		X	X
Content folders viewed	X		
Content files viewed	X		
Calendar views			

(25%). The number of interactions recorded by the course management system was not factored into the course grade.

The instructional design for the course was consistent with Kearsley and Shneiderman's (1998) engagement theory. Assignments were flexible so students could determine for themselves the context for application of course concepts. Students also frequently interacted with each other and the instructor. This was especially true for the research proposal assignment.

Data for this study were limited to what was collected by the course management system in the normal delivery of the research methods course. WebCT Vista/Blackboard Version 8 was the course management system used each semester. The tracking tool was used to generate reports of student interactions. Interactions tracked in this study are listed in Table 2 and classified using Moore's (1989) types of interaction. The grade book tool was the source of data on students' grades.

Data were analyzed with PASW Statistics 18 Release 18.0.0. Means, standard deviations, and Pearson correlations were used to summarize the data. Effect sizes for Pearson correlations were based on Cohen's (1988) descriptors.

Results

Objective 1. Describe student interaction by grade group and year.

Table 3 shows the means and standard deviations for interactions by grade group and year. Overall, there were 54 comparisons between groups of students who earned grades of B+ or lower and groups who earned grades of A- or A. In 45 of these comparisons, the average number of interactions for the A- or A groups exceeded the average number of interactions for the B+ or lower groups. In every comparison, the A- or A groups had a higher mean for number of sessions, total time in minutes, discussions read and content files viewed than the B+ or lower groups. Furthermore, in a majority of comparisons, the A- or A groups had a higher mean for discussions posted, e-mail messages sent, e-mail messages read and content folders viewed than the B+ or lower groups. In 3 of the 5 years studied, the B+ or lower groups had a higher mean than the A- or A groups for course calendar views.

Objective 2. Describe associations between specific interactions and final percentage grade by year.

Pearson correlations were used to describe the associations between interactions and students' final percentage grade (Table 4). Number of sessions, total time in minutes, discussions read, and content files viewed were positively correlated with achievement in each of the 5 years studied. The influence of specific interactions on achievement varied significantly by year. For example, the effect size for the correlation between number of sessions and final percentage grade

Table 3. Means and Standard Deviations for Interactions by Year and Grade Group

Interaction	Year	Grade group			
		B+ or lower		A- or A	
		M	SD	M	SD
Number of sessions	2008	120	77	167	77
	2009	156	84	181	82
	2010	128	45	174	80
	2011	100	28	150	69
	2012	79	16	92	35
	All	121	65	151	75
Total time in minutes	2008	2634	1609	4632	3586
	2009	3044	1826	3206	1574
	2010	2945	1236	3237	1296
	2011	2227	697	2781	884
	2012	1688	474	2349	667
	All	2597	1406	3251	2064
Discussions posted	2008	22	6	22	3
	2009	18	2	19	1
	2010	20	3	19	2
	2011	19	4	21	4
	2012	21	2	22	5
	All	20	4	21	4
Discussions read ²	2008	4289	6959	6911	13195
	2009	2834	3720	3251	4792
	2010	3456	3773	3703	6183
	2011	1101	1199	6620	10796
	2012	818	1040	1004	1000
	All	2763	4421	4490	8820
E-mail messages sent	2008	9	4	10	5
	2009	11	5	14	8
	2010	11	7	11	3
	2011	9	4	11	7
	2012	11	7	11	10
	All	10	5	11	7
E-mail messages read	2008	16	7	18	11
	2009	25	11	26	12
	2010	18	13	25	8
	2011	18	12	19	11
	2012	25	20	20	19
	All	20	12	21	13
Content folders viewed	2008	154	132	249	164
	2009	417	250	376	195
	2010	196	57	252	83
	2011	178	79	223	101
	2012	142	32	172	67
	All	227	178	249	142
Content files viewed	2008	103	41	128	48
	2009	126	48	150	62
	2010	247	100	286	76
	2011	227	99	231	76
	2012	159	66	182	56
	All	166	91	192	83
Calendar views	2008	65	59	53	38
	2009	42	36	123	135
	2010	82	81	68	107
	2011	63	60	73	73
	2012	65	60	44	51
	All	63	60	70	85

² The number of discussions read may seem high. Many students likely used the compile function to read messages rather than opening messages one at a time. Compiling opens all messages within a discussion area. This results in all messages being counted as read each time the messages are compiled within a discussion area.

was large in 2010, medium in 2011 and 2012, small in 2009 and had no effect in 2008. Other variables with moderate effect sizes in at least 2 years were total time in minutes, discussions posted, discussions read, and content folders viewed.

Associations between Learner

Table 4. Pearson Correlations Between Interactions and Final Percentage Grade by Year

Interaction	Year					
	2008	2009	2010	2011	2012	All years
Number of sessions	.04	.22 ^a	.51 ^c	.49 ^b	.35 ^b	.22 ^a
Total time in minutes	.43 ^b	.05	.08	.20 ^a	.60 ^c	.22 ^a
Discussions posted	.12 ^a	.19 ^a	-.45 ^b	.39 ^b	.25 ^a	.13 ^a
Discussions read	.05	.09	.25 ^a	.31 ^b	.30 ^b	.12 ^a
E-mail messages sent	.12 ^a	.26 ^a	-.18 ^a	-.06	.01	.05
E-mail messages read	.18 ^a	.10 ^a	.05	-.06	-.10 ^a	.05
Content folders viewed	.36 ^b	-.04	.31 ^b	.23 ^a	.28 ^a	.18 ^a
Content files viewed	.35 ^b	.13 ^a	.03	.06	.10 ^a	.12 ^a
Calendar views	-.03	.26 ^a	-.04	.01	-.04	.05

Note: Effect sizes based on Cohen's (1988) descriptors with ^a=small; ^b=medium; ^c=large.

Conclusions, Recommendations, and Discussion

Overall engagement, as indicated by frequency of interactions and time online, was related to student achievement in the online research methods course over a 5-year period. This is consistent with Pratt-Phillips's (2011) research, which spanned a 3-year period and involved 72 students.

Learner–content, learner–instructor, and learner–learner interaction all had an influence on grades. Interaction with course content had the greatest impact on achievement. To promote positive learning outcomes in online courses, instructors should engage students early and consistently throughout the course through interactions with course content, the instructor, and other students. This recommendation is consistent with Moore's (1989) admonition “that distance educators in all media do more to plan for all three kinds of interaction” (p. 6). It is also consistent with Moore and Kearsley's (2012) transactional distance theory. This theory suggests that distance is present in any educational environment and is a function of structure and dialogue. Greater distance is associated with greater structure and less dialogue. Educators should strive to use online instructional tools to promote interactions that offer an optimal level of structure and dialogue for a particular setting.

The magnitude of associations between grades and specific interactions varied significantly by year. This suggests that instructors should not expect any specific amount or form of interaction to reliably predict a group's achievement, and certainly not an individual's achievement. This suggestion is supported by Parry's (2012) report that Rio Salado College's efforts to enhance student grades were not consistently successful. Rio Salado College implemented interventions when students' online interactions were not consistent with those determined to predict achievement. We know that students differ in the ways they approach learning and in their need for different types of interaction. To accommodate a range of student needs and preferences, students should be afforded a variety of ways to interact with course content, the instructor and each other.

Calendar views were not categorized as learner–content, learner–instructor, or learner–learner interaction. Calendar views produced a small effect in only 1 of 5 years. This suggests there is no direct impact of

this organizational tool on student achievement. Even so, the instructor believes the calendar is a valuable navigation aid for students and may indirectly influence achievement.

This study was limited to one online graduate-level course focused on research methods used in agricultural education and related disciplines. As a result, this study should be replicated across a greater number and variety of courses. This study did not account for all possible interactions. For example, the extent to which students used their textbook or communicated with peers and the instructor outside of the course management system was not measured. Future studies should explore data on interactions that occur outside the course management system milieu.

Course management systems can provide an objective record of the number and type of student interactions in online courses. However, they provide no way of knowing if or how students' minds are engaged in the course while they are online. Resnick (2007) provided a sound rationale for focusing not just on amount of time but also on how students use that time. Future research should examine the extent to which students interact and also how they interact, their thought processes, and their preferences for particular tools and techniques. Qualitative methodologies would be particularly valuable for such studies.

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Forestry Students' Global Perspectives and Attitudes toward Cultural Diversity¹

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Abstract

This research measured the level of global perspectives and attitudes toward cultural diversity among forestry students in Alabama. Established survey scales were used for these constructs. A descriptive, census survey occurred to collect the data at the Forestry, Ecology and Wildlife Program at Alabama A&M University and at the Department of Forestry at Auburn University. The objectives were to assess the international experiences, level of global perspectives and attitudes toward cultural diversity among Alabama's forestry students. Descriptive statistics of means, standard deviation, ranges and frequencies were the main analysis approach. Students had a moderate global perspective and a positive attitude toward cultural diversity. Students who had more contact with international people and overseas experiences scored slightly higher on the global perspectives and the attitudes toward cultural diversity constructs. Students obtained most of their information about other countries from television, family/relatives, friends and radio news. Significant correlations occurred between global perspectives and attitudes toward cultural diversity and between global perspectives and mother's and father's level of education. Also, significant correlations occurred between attitudes toward cultural diversity and college GPA. The global perspectives and attitudes toward cultural diversity constructs and home origin had several significant relationships.

Introduction

United States' higher education system and employers, both private and public sectors, are paying increased attention to issues of globalization and cultural diversity. As international communities move increasingly toward greater interdependence of cultures and economies, an explosion of globalization is occurring in the nation's institutions of higher education, colleges and universities. Torres (2002) stated that the transition is driven by the demands to prepare a workforce for the global marketplace and to prepare our citizenry to participate in global polity.

The U.S. citizenry and policymakers have concluded that for the economy to compete and win in the global marketplace of the 21st century, schools, colleges and universities must prepare the workforce to meet the demands of a global market (Artiles, 2003). Advances in technology, politics, culture, economies and ecological systems give rise to connections among diverse people and cultures worldwide (Hutchins, 1996; Kauffmann et al., 1992; Carlson et al., 1990). However, with advances in globalization, interdependence and diversity, there must also be cross-cultural competencies for U.S. forestry students and subsequent forestry graduates.

Coupled with globalization changes, society is experiencing a shift in demographic trends and an increase in cultural diversity (Galambos, 2003). One only has to examine the educational institutions to see increased diversity in schools and the diverse workforce

¹The human subjects' review was approved by the IRB committees at Alabama A&M University, Auburn University and Tuskegee University. Subjects' consent was implied by completing and returning the survey.

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of the future. Higher educational institutions' ethnic undergraduate enrollment is projected to increase to 41.73% by 2021, up from 26.17% in 1996 (Hussar and Bailey, 2013). All of the nation's institutions, primary, secondary, post-secondary and industries, are impacted by the changing ethnic character of the U.S. population.

For this paper we will use the following definitions of culture, diversity, global perspective and attitude toward cultural diversity: 1) culture is the knowledge, experience, values, ideas, attitudes, skills, tastes and techniques that are passed on from more experienced members of a community to new members (Prevention by Design, n. d.); 2) diversity is the acknowledging, understanding, accepting, valuing and celebrating differences among people with respect to age, class, ethnicity, gender, physical and mental ability, race, sexual orientation, spiritual practice and public assistance status (Green et al., 2014; Amadeo, 2013; Dike, 2013; Cunningham and Green, 2007; Esty et al., 1995). Other elements are religious beliefs, life stages, education, career responsibilities, personality and marital status (McLaren, 2009); 3) *"global perspective reflects a global and holistic view of student learning and development and the importance of the campus environment in fostering holistic student development. ... measures how a student thinks, views herself as a person with a cultural heritage and relates to others from other cultures, backgrounds and values"* (Braskamp, 2014); and 4) attitude toward cultural diversity is one's feeling, thought, or disposition about the differences among people with respect to race, class, ethnicity, socio-economic status, religious affiliation, age, language, physical and mental ability, sexual orientation and other human attributes (Grogan and Eshelman, 1998; Stanley, 1996).

Objectives of this investigation were to assess global perspectives and attitudes toward cultural diversity among Alabama's undergraduate forestry students. The research questions were:

1. What are the international experiences of forestry students in Alabama?
2. What is the level of global perspective among Alabama's forestry students?
3. What are the attitudes toward cultural diversity among Alabama's forestry students?
4. What are the relationships between major demographics and, students' global perspectives and attitudes toward cultural diversity?
5. Do scores of global perspectives and attitudes toward cultural diversity constructs differ by home origin and number of completed college courses related to global issues?

Methods

Data collection occurred via descriptive, census survey research. Study population was all undergraduate forestry students (sophomores, juniors and seniors) enrolled in the Forestry, Ecology and Wildlife Program at Alabama A&M University and in the Department of Forestry at Auburn University during the 2013 spring

semester. There were three constructs in the instrument and a total of 71 variables. Construct I covered background and/or demographics, construct II consisted of attitudes toward global perspectives and construct III covered attitudes toward cultural diversity.

Overall Cronbach's alpha coefficient of reliability for constructs II and III combined was 0.83, construct II was 0.80 and construct III was 0.70. Global perspectives and the attitudes toward cultural diversity constructs were after Zhai and Scheer (2004) and they adapted them from Hett's (1993) "Global Mindedness Scale" and from Stanley (1996) "Attitudes toward Cultural Diversity and Pluralism Scale", respectively. Content and face validity of the instrument occurred via a panel of experts and a field test of six students. No revisions were necessary following the pilot test. Test surveys were omitted from this analysis. Eighty-six surveys were distributed to Alabama's undergraduate forestry students. Thirty-seven useable surveys were returned, yielding a response rate of 43.02%. Data analysis occurred as:

1. The main analysis approaches were descriptive statistics of means, standard deviation (S.D.), ranges and frequencies;
2. Correlations were computed between selected socio-demographics of students and their global perspectives and attitudes toward cultural diversity;
3. Following each solicitation (to control for non-response error), the returned questionnaires were kept separately and analyzed via t-test to see if there was a difference between the overall means of the early and late respondents;
4. T-test, by gender and race, were conducted of each variable of the global perspectives and attitudes towards cultural diversity constructs;
5. Categorical analysis of means for constructs II and III occurred using the following scale: 1 very strongly disagree (M = 1.00 – 1.83); 2 strongly disagree (M = 1.84 – 2.67); 3 disagree (M = 2.68 – 3.51); 4 agree (M = 3.52 – 4.35); 5 strongly agree (M = 4.36 – 5.19); 6 very strongly agree (M = 5.20 – 6.0);
6. T-test measured the differences of overall mean scores for global perspectives and attitudes toward cultural diversity constructs between gender and overseas experiences; and
7. One-way ANOVA tested the differences of level of global perspectives and attitudes toward cultural diversity in terms of home origin and number of completed college courses related to global issues.

Results

A t-test revealed a significant difference between the overall mean scores of the early and late respondents. According to Lindner et al. (2001), the late respondents sample size should be at least 30 in order to be meaningful practically and statistically. However, our late sample size is, 9, too small to make a meaningful statistical test. To control for non-response bias, the sample was divided into halves and t-tested. One-half,

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19, of the sample is not large enough either to make a meaningful statistical test. Thus, the results can only be generalized to the Alabama forestry students' population.

Respondents' indicated gender was 16.22% females and 83.78% males. The reported mean age was 23.25 years old, $n = 32$, $S.D. = 4.27$. The majority of the respondents, 81.08%, reported Caucasian as their ethnicity and 13.51% reported African American. Two students or 5.41% did not report an ethnicity.

A total of 83.78% of the students stated that they have or had an advisor or instructor who is of international origin. Due to the small sample size, not one of the respondents had participated in the U.S. Study Abroad Program (U.S. SAP), 2.70% stated that they planned to participate in the U.S. SAP and 18.92% stated that they were undecided as to whether they will participate in the U.S. SAP. When the respondents were asked "if they had overseas experiences, work, study, or travel," 24.32% indicated "yes" and 75.68% indicated "no." A total of 10.81% of the students indicated that they stayed abroad one week, 8.11% indicated that they stayed abroad one month or more and 5.41% indicated that they stayed abroad two weeks.

Table 1 shows the students' reported international related experiences. The reported major sources of information about other countries were television 81.08%, family/relatives 59.46%, friends 59.46%, radio news 51.35%, books 45.95%, newspaper/magazines 37.84% and other 37.84%. One-half of the "other" responses consisted of the internet. A total of 45.95% of the respondents indicated that they completed one to two courses related to global issues, 10.81% indicated that they completed seven to eight courses related to global issues, 8.11% indicated that they completed five to six courses related to global issues and 2.70% indicated that they completed three to four courses related to global issues. The mean score of students' "general contact with inter-

Table 1. International experiences of the responding forestry students. Sources of information about other countries, number of completed college courses related to global issues, overseas experiences, and general contact with international people.

Sources of information about other countries				
Variables	Freq	% ¹	Mean	S.D.
Newspaper/magazines	14	37.84		
Television	30	81.08		
Radio news	19	51.35		
Books	17	45.95		
Family/relatives	22	59.46		
Friends	22	59.46		
Other	14	37.84		
Number of completed college courses related to global issues				
Variables	Freq	% ¹	Mean	S.D.
None	12	32.43		
1-2 courses	17	45.95		
3-4 courses	1	2.70		
5-6 courses	3	8.11		
7-8 courses	4	10.81		
More than 8 courses	0	0		
Prior overseas experiences and contact with international people				
Variables	Freq	% ¹	Mean	S.D.
Yes	9	24.32		
No	28	75.68		
General contact with international people ²			2.19	1.29

¹Percent = percent of total respondents ($n = 37$)

²Scale is based upon: 1 = none, 2 = occasional to 5 = constant

Table 2. Mean scores, n, and S.D. of the students' attitudes toward global perspectives.

Variables	n	Mean	S.D.
Generally, an individual's actions are too small to have a significant effect on the ecosystem.*	37	3.03	1.34
Americans have a moral obligation to share their wealth with the less fortunate peoples of the world.	35	3.11	1.55
It is not really important to me to consider myself as a member of the global community.*	37	3.16	0.99
I feel a strong kinship with the worldwide human family.	37	3.24	0.83
I am able to affect what happens on a global level by what I do in my own community.	37	3.35	0.98
American values are probably the best.*	37	3.37	1.16
Really, there is nothing I can do about the problems of the world.*	36	3.42	1.16
When I see the conditions some people in the world live under, I feel a responsibility to do something about it.	36	3.50	1.13
I have very little in common with people of underdeveloped nations.*	36	3.53	0.91
Americans should be permitted to pursue the standard of living they can afford if it only has a slight negative impact on the environment.*	36	3.53	0.94
I sometimes feel irritated with people from other countries because they don't understand how we do things here.*	37	3.59	1.07
I sometimes try to imagine how a person who is always hungry must feel.	36	3.61	1.02
I think of myself, not only as a citizen of my country, but also as a citizen of the world.	36	3.75	1.44
The present distribution of the world's wealth and resources should be maintained because it promotes survival of the fittest.*	36	3.75	1.16
I think my behavior can impact people in other countries.	37	3.89	1.07
My opinions about national policies are based on how those policies might affect the rest of the world as well as the United States.	37	3.92	1.13
When I hear that thousands of people are starving in an African country, I feel very frustrated.	37	3.92	0.98
It is important that American universities and colleges provide programs designed to promote understanding among students of different ethnic and cultural backgrounds.	36	4.00	1.22
I generally find it stimulating to spend an evening talking with people from another culture.	36	4.00	1.29
I feel very concerned about the lives of people who live in politically repressive regimes.	36	4.00	1.12
In the long run, America will probably benefit from the fact that the world is becoming more interconnected.	36	4.06	1.07
The United States is enriched by the fact that it is comprised of many people from different cultures and countries.	37	4.08	1.23
I enjoy trying to understand people's behavior in the context of their culture.	37	4.16	1.14
The fact that a flood can kill 50,000 people in Bangladesh is very depressing to me.	37	4.16	1.26
Americans can learn something of value from all different cultures.	37	4.38	1.09
The needs of the United States must continue to be our highest priority over needs of other countries.*	37	4.43	1.09
I feel an obligation to speak out when I see our government doing something I consider wrong.	37	4.43	1.21
I often think about the kind of world we are creating for future generations.	37	4.59	1.09
It is very important to me to choose a career in which I can have a positive effect on the quality of life for future generations.	36	4.67	0.96
It is important that we educate people to understand the impact that current policies might have on future generations.	36	4.81	0.92
Overall mean score		3.83	1.22

(very strongly disagree = 1, strongly disagree = 2, disagree = 3, agree = 4, strongly agree = 5, very strongly agree = 6). Negatively worded variable (indicated by *) scores' were reversed when calculating the overall means.

national people” variable was 2.19, S.D. = 1.29, n = 37; based on a scale from 1 = none to 5 = constant.

Table 2 shows the overall global perspectives mean score is moderate at 3.83, S. D. = 1.22. Table 3 shows the overall attitudes toward cultural diversity mean score is also moderate at 4.20, S. D. = 1.27. A t-test, by gender, of the variables of the global perspectives and the attitudes toward cultural diversity constructs revealed no statistically significant variables. However, a t-test, by ethnicity, of the variables of the global perspectives and the attitudes toward cultural diversity constructs revealed two statistically significant variables. The significant variables are “they helped me set goals for my future”, t value=3.41 and they helped me achieve

my personal goals, t value=3.02.” Both variables are significant at the 0.002 level, Bonferroni 0.05/18 and are from the attitudes toward cultural diversity construct.

Table 4 shows the Pearson correlation analyses of the overall rating of global perspective and the attitudes toward cultural diversity constructs, student age, college GPA, contact with international people, parents’ educational level, number of completed college courses related to international issues, overseas experiences and students’ level of education sought. We used the description outlined by Hopkins’ (2000) to interpret the correlation coefficients. Only significant moderate associations, $r > 0.30$, are discussed here. Students reported a high relationship with global perspectives, $r = 0.74^{**}$ and attitudes toward cultural diversity. College GPA had a significant relationship with attitudes toward cultural diversity, $r = 0.42^{**}$. The students’ mother’s and father’s level of education had a moderate, negative, relationship with global perspectives, $r = -0.34^*$ and $r = -0.38^*$, respectively.

A t-test, of the overall scores of the global perspectives and the attitudes toward cultural diversity constructs, revealed no significant differences among gender and overseas experiences. Table 5 shows the one-way ANOVA results of global perspectives and attitudes toward cultural diversity and home origin. Global perspectives and attitudes toward cultural diversity and home origin had several statistically significant items. No statistically significant items occurred when we tested, via one-way ANOVA, the global perspectives and attitudes toward cultural diversity constructs with number of completed college courses related to global issues.

Discussions

A total of 45.95% of the respondents indicated that they had completed at least one to two courses that related to global issues. This is a positive finding, as Henderson-King and Kaleta (2000) concluded that

Table 3. Mean scores, n, and S.D. of the students’ attitudes toward cultural diversity.

Variables	n	Mean	S.D.
Students should give up their cultural beliefs and practice to fit in with other students of the dominant culture.*	36	2.11	1.04
There is really nothing that educational systems can do for students who come from lower socio-economic groups.*	34	2.50	1.02
I am uncomfortable around students who ethnic heritage is different from my own.*	37	2.70	1.27
Cultural diversity is a negative force in the development of the U.S. society.*	35	2.89	1.30
Minority students are hard to work with.*	34	3.32	1.15
The perspectives of a wide range of ethnic groups should be included in the curriculum.	35	3.49	1.07
Minority individuals should adopt the values and lifestyles of the dominant culture.*	37	3.59	1.12
Educational activities should be representative of a wide variety of cultures.	37	3.81	1.05
Educators should plan activities that meet the diverse needs and develop the unique abilities of students from different ethnic background.	37	3.84	1.12
I enjoy being around people who are different from me.	35	3.94	1.28
Each minority culture has something positive to contribute to U.S. society.	37	4.00	1.37
Cultural diversity is a valuable resource and should be preserved.	35	4.03	1.04
All students should learn about cultural differences.	35	4.34	1.11
Students should be taught to respect those who are different from themselves.	35	4.51	1.44
Each student should have an equal opportunity to learn and succeed in education.	35	4.54	1.42
In education, it does not matter if a student is rich or poor, everyone should have the same chance to succeed.	35	4.60	1.19
Education should help students develop respect for themselves and others.	36	4.69	1.19
Students should feel pride in their heritage.	37	4.97	1.14
Overall mean score		4.20	1.27

(very strongly disagree = 1, strongly disagree = 2, disagree = 3, agree = 4, strongly agree = 5, very strongly agree = 6). Negatively worded variable (indicated by *) scores’ were reversed when calculating the overall means.

Table 4. Pearson correlations analysis between selected demographics variables and, global perspectives and attitudes toward cultural diversity scales.

Variables	Global perspectives		Attitudes toward cultural diversity	
	Coefficient	Description	Coefficient	Description
Attitudes toward Cultural Diversity (n=37)	0.74**	Very large		
Age (n=32)	0.26	Low	0.21	Low
College GPA (n=37)	0.30	Moderate	0.42**	Moderate
Contact with international people (n=37)	0.08	Trivial	-0.04	Trivial
Mother’s education (n=37)	-0.34*	Moderate	-0.09	Trivial
Father’s education (n=37)	-0.38*	Moderate	-0.19	Low
Number of international courses (n=37)	-0.10	Trivial	0.12	Low
Overseas experiences (n=37)	-0.09	Trivial	-0.08	Trivial
Education level sought	0.07	Trivial	0.19	Low

*Correlation is significant at the $P=0.05$ level
 **Correlation is significant at the $P=0.01$ level

Table 5. One-way ANOVA analysis results of, means and standard deviations, global perspectives and attitudes toward cultural diversity, and home origin.

Global perspectives and home origin			
Home origin ¹	Means	S.D.	n
I	4.22 ^a	0.35	8
II	3.79 ^b	0.37	9
III	3.72 ^b	0.35	8
IV	3.50 ^b	0.95	2
V	3.91 ^{ab}	0.35	4
VI	3.74 ^b	0.35	6
Attitudes toward cultural diversity and home origin			
Home origin ¹	Means	S.D.	n
I	4.26 ^a	0.43	8
II	3.62 ^b	0.38	9
III	3.75 ^b	0.57	8
IV	2.76 ^c	0.58	2
V	3.77 ^{ab}	0.23	4
VI	3.68 ^b	0.52	6

¹I=rural, farm and nonfarm; II=rural town (<10,000 residents); III=small town (10,000-20,000 residents); IV=moderatesized city (20,001-60,000 residents); V=large city (60,001-100,000 residents); and VI=urban area (> 100,000 residents).
^{abc}Means without a common superscript differ significantly ($P=0.05$).

female students who participated in a university diversity course exhibited sustained feelings at the end of the semester toward minorities and men. They further concluded that the course did not improve intergroup tolerance but acted as a buffer against diminishing intergroup tolerance. However, other researchers (Henderson-King and Stewart, 1999; Musil, 1992) reported that women's studies courses influenced students' sociopolitical views, feelings about various groups and the way students think about human differences.

When we tested the ethnicity differences of the global perspectives and cultural diversity constructs, the t-test showed the attitudes toward cultural diversity construct had two statistically significant variables, "they helped me set goals for my future and they helped me achieve my personal goals." The above statements are in agreement with the findings of Green et al. (2014), they stated that the benefits of diversity in an organization include: reduce lawsuits, increased marketing opportunities, increased recruitment, increased creativity and increased business image.

Although the above relates more towards corporations, Hampton and Lee (2014) outlined a few individual benefits of diversity. They stated that the individual: 1) achieves his/her full potential as a human; and 2) contributes his/her fullest to society. Age, number of completed college courses related to global issues and prior overseas experiences were not related to global perspectives and/or cultural diversity. This finding is in contrast to those findings of other researchers (Odel et al., 2002; Zhai and Scheer, 2002; Herm, 1996). The above researchers suggested that participation in overseas programs tended to have a positive influence on students' global perspectives and/or cultural diversity.

The students' parents' level of education had a significant, negative, moderate relationship with global perspectives. As the mother's and father's level of education goes up, the students' global perspectives go down. One interpretation of this finding is that the more affluent the student is the more isolated he/she becomes. The above finding is in contrast with the conclusions drawn by Simon and Answorth (2012) in a study of study abroad participants. They concluded that differences in attitude towards study abroad participation were related to past international exposure, social class and race. Further, students who had lived or traveled abroad were more likely to value a study abroad experience. Additionally, socioeconomically advantaged students tend to participate in study abroad programs because their families cultivated that experience (Lareau, 2000).

Summary

Forestry students obtained the most information about other countries from television, family/relatives, friends and radio news. About one quarter of the students reported that they have had an overseas experience. The students reported a moderate global perspective and a positive attitude toward cultural diversity. Students who reported a higher level of global

perspective tended to also report a more positive attitude toward cultural diversity. Students' age, number of completed college courses related to global issues and overseas experiences did not correlate well with global perspectives and/or attitudes toward cultural diversity. College GPA had a significant relationship with students' attitudes toward cultural diversity. The students' parents' level of education had a moderate, negative, relationship with global perspectives. As the students' mother's and father's education level increased, the students' global perspectives go down.

Recommendations

Thus, forestry administrators, advisors and instructors should: 1) encourage forestry students to participate in global perspectives and/or cultural diversity related activities. That is, whether it be formal classes, university sponsored extracurricular activities, or students sponsored extracurricular activities; 2) maintain and even develop programs that foster contact with international people and overseas experiences; 3) develop programs to expose forester students, who tend to be middle class students, to global perspectives and/or cultural diversity related activities; 4) the robust relationship between global perspectives and attitudes toward cultural diversity suggest that these two items should be incorporated into student development programs; 5) the data revealed that the forestry students had an occasional contact with people from other countries. The departments of forestry need to promote, enhance and/or develop programs that facilitate interactions between U.S. students and international people. 6) expend more resources and energy in the recruitment of minority students, staff and faculty. By increasing diversity of the student body, staff and faculty, students will potentially be exposed to a culturally diverse learning environment. Such exposure will provide the students' opportunities for positive interactions among diverse groups of students, staff and faculty; 7) encourage students to participate in MANRRS in an effort to expand their multicultural horizons. The goal is to educate and help the students transform into employees who can function in diverse and/or multicultural teams.

Study Limitations

Due to distributing and collecting the survey in a classroom setting caused the following: 1) the fraction of responses was not randomly selected; 2) some students may have felt forced to take a survey, complete it and return it; and 3) assumed all units would be present on the day the survey was distributed. Due to a host of reasons, students may have refused to participate in the survey and caused self-selection bias. Due to a small response number, the survey results are subject to unit non-response bias. Some questions appeared leading and the result is some students may have guessed a perceived correct response, or determined a perceived correct "moral" response. This makes the survey results subject to response bias. Due to the limited number of

unit responses and the apparent non-response bias, the survey results can only be generalized to Alabama's forestry students.

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Social Media and Equine Science: The Effect of LinkedIn on In-Class Engagement of Equine Higher Education Students¹

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Abstract

Social media is a major method of communication in society today, allowing people worldwide to interact with just the click of a mouse. Social media has also become more frequently used in the equine industry. This study explored the benefit of using a social media site as a teaching tool in equine higher education curriculum. In particular, it involved the incorporation of LinkedIn as a required participation effort for equine science students. Four equine science classes were selected for participation in this study. All classes were taught by the same instructor and in a traditional lecture/discussion format; however, two courses had an additional social media component added. The treatment groups participated in assignments during the semester using LinkedIn. Pre-course, mid-course and post-course data collection were conducted in each class and grade data was collected at the end of the semester. Data were analyzed using descriptive statistics. Results revealed that the majority of students felt social media was an effective tool in the equine science classroom; however, it did not replace the traditional lecture format as the most effective method of teaching. Results also suggested that students felt the social media portion positively influenced the teacher-student relationship.

Introduction

Social media has changed the way people from all over the world communicate, the ease of use increasing the amount of online interaction on both computers and smart phones. Websites such as Facebook, Twitter and LinkedIn each provide a template for communication that spans across countries and cultures. Interactions on these sites can lead to various social situations, friendships and even possible employment opportunities. LinkedIn, for example, refers to itself as “the world’s largest professional network” (LinkedIn.com, 2013). As of 2013, the site had 250 million users in 200 countries around

the world and its popularity steadily increased since their launch in 2003. The website shares a similar layout with Facebook, but has a more professional, resume-like feel, with more detail given to past and present employment, current projects and other professional endeavors. What is unique to LinkedIn is that it allows users to give each other “endorsements” that vouch for another users proficiency in certain skills or areas. When used properly, a user can build up a sizable group of cyber references through “endorsements” that suggest them to possible employers for specific tasks. Another unique feature of LinkedIn is that their “groups” act more as intellectual forums, where people in a certain field can interact over current topics, look for employment and gain access to research materials or articles (LinkedIn.com, 2013).

An increasing amount of research has been conducted involving the incorporation of various social media sites into educational curriculum. Many faculty and staff in the academic community see social media in a pessimistic light as a “technological disruption to pedagogy”, while others see endless possibilities in which this additional educational space of connectivity could provide for students and educators alike (Rambe, 2012, p. 1). A study conducted at the University of the Free State in South Africa, Facebook was incorporated into the course curriculum. Results suggested that by thinking outside the traditional pedagogical path and utilizing social media in classroom, students were able to have a “safe haven” for self-expression, access to a more advanced learning community and a greater opportunity for academic networking (Rambe, 2012). In another study conducted in 2011, a social media survey determined that almost two-thirds of instructors had used social media in their curriculum and 30% of those teachers used content that students could interact with outside of classroom time (Abe, 2013).

¹The Murray State University Institutional Review Board approved the study protocol and all participants provided written informed consent prior to participation in the study.

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Facebook is not the only social media site used in the classroom. A study using Twitter examined the use of the site as a supplement to the curriculum in a college course and evaluated students' engagement and grades. Engagement was measured using a 19 item scale based on the National Survey of Student Engagement (Junco, 2011). Students who received the supplemental social media portion had both grades and classroom engagement that were statistically higher compared to the control group (Junco, 2011).

Research has also examined the effect of utilization of social media in education on the student-teacher relationship. Findings suggested that the use of social media sites in the classroom not only appeared to engage students in the material, but also created deeper and more collaborative relationships between instructors and students (Briones, 2013). However, there has been limited research on student user experiences or the experiences of the instructors who implement social media into their curriculum (Veletsianos et al., 2013). Whether or not traditionalists want to utilize it, social media and other forms of technological advancement are encroaching quickly on the pedagogical norms. While arguments over whether or not to use social media in the classroom generally stay the same, the real question now is: "How do we continue to capitalize on the advantages delivered by social media?" (Leece and Campbell, 2011).

The main goal of using social media in education is to discover and utilize alternative ways to provide an engaging experience in the classroom. 'Engagement' is a word commonly used by educators as the ultimate measure of their students' learning experience. Engagement can be defined as "a dynamic and constantly reconstructed relationship" (Leece and Campbell, 2011). Therefore, in order for students to be engaged in their educational experience, they must be committed to active participation and interaction with the material. Social media, by nature, promotes engagement purely by providing a space for dynamic interaction and idea-sharing (Leece and Campbell, 2011). This promotes the question of whether or not social media, with its innate engagement qualities, in combination with higher education can in fact facilitate a higher level of student engagement in the material.

In pursuit of student engagement, the use of online classes in the very hands-on field of equine science education has become more and more frequent. Michigan State University Extension has a highly successful online equine education website called My Horse University, which offers online courses relating to horse care and business management (myhorseuniversity.com). Pratt-Phillips (2011) examined the relationship between student participation in online-formatted class activities, grades and engagement in a distance equine science course and suggested that students who were more active online and interacted with other students in the online activities were significantly more engaged in

the material than those who did not participate (Pratt-Phillips, 2011).

This study involved the implementation of LinkedIn into the required course participation of equine science students as an outside of class interaction with their material. The purpose of the study was to examine the benefits of using a social media site as a supplemental portion in an equine higher education curriculum.

Methods

Students (n = 26) enrolled in advanced-level equine science classes were selected for participation in this study during the fall 2013 (n = 9) and spring 2014 (n = 17) semesters. All classes were taught by the same instructor and in a traditional lecture/discussion format; however, one course each semester had an additional social media component. Each semester, both courses met with the instructor for the same number of face-to-face class sessions each week and both the traditional group (TRAD) students and treatment students (LINK) completed standard assignments. LINK students were also required to participate in several assignments during the semester using the LinkedIn site. Assignments included having students create their own profile, join a group set up specifically for the class and interact with their classmates by reviewing and discussing peer-reviewed research complete with references that was posted periodically to the group within the LinkedIn site (Figure 1). Their interactions were in the form of "comments" on discussion threads and they were also able to "like" posts made by other students (Figure 2). The professor also interacted with the students through "comments" on the page by answering questions and contributing to discussions. To improve the validity of the discussion posts, the professor did not allow incorrect

Figure 1: Home page for the LinkedIn group specifically developed for the course and used by the LINK group to complete several assignments during the Fall 2013 and Spring 2014 semesters.

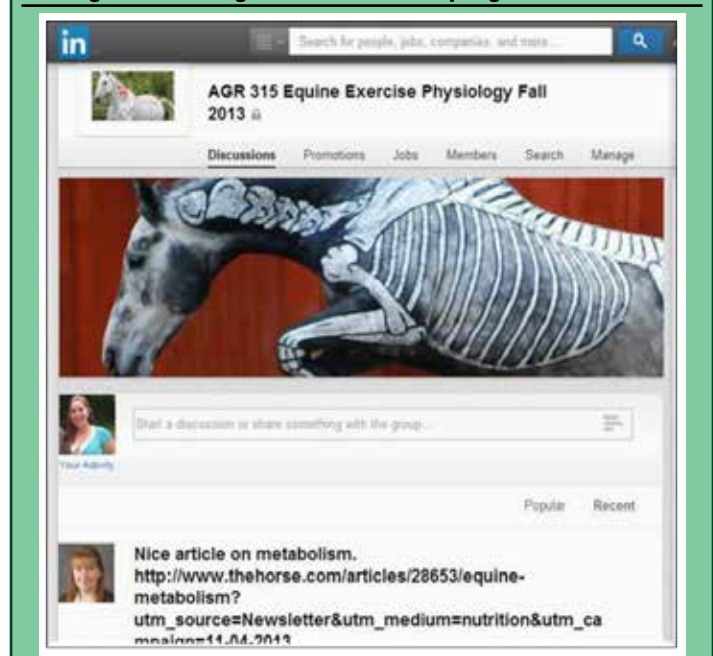


Figure 2: Example assignment posted to the LinkedIn group for the LINK group.



information to exist on the page. LINK students were also required to interact on other equine science related groups on LinkedIn and to submit periodic summaries of the question and discussion activity occurring within those groups. Completion of the assignments was graded.

Pre-course, mid-course (only for the LINK group) and post-course surveys were conducted in each class. Questions included 4-point Likert-type scales and open-ended responses and all surveys were presented to the students in person during a class period. The pre-course survey was comprised of questions regarding the use of social media in classes previously attended, the effectiveness of social media in the classroom and the impact of social media on career opportunities. The mid-course survey was only distributed to LINK students and was composed of questions regarding the students' experience with the LinkedIn component of the class to that point, their perceived impact of the LinkedIn component on their grades and their thoughts on how the social media portion could be better used to benefit the students. The post-course survey was comprised of the same questions as the pre-course survey, with additional questions for the LINK group regarding the effect of LinkedIn on their learning experience and the communication/relationship with their professor and their classmates during the course.

Due to low student numbers, data from both semesters was combined and analyzed using descriptive statistics.

Results and Discussion

In both the TRAD and LINK groups, the majority of students thought that social media would be effective as a tool in higher education equine science classes and finding/securing career opportunities. According to the pre-course survey, 77% of the students in both classes

had used a social media site previously in a college course. Of the TRAD students, 78% had previously experienced social media in the classroom, while 83% of LINK students reported the same. This means that 17% of the students in the LINK group were experiencing social media used in the classroom for the first time. Students who were experienced with social media in the classroom had used sites such as Pinterest, Facebook and YouTube, but never LinkedIn as an educational supplement.

At midterm, the mid-course survey was administered to the LINK group to evaluate their feelings about how LinkedIn was being used in the class and to inquire about any thoughts or suggestions that they might have regarding the use of LinkedIn thus far. When asked how the social media portion could be better utilized and helpful to the students, one LINK student's response was *"Involve more of the class work with LinkedIn, discuss what was said in class on the forum and relate it back to everyday use to better increase everyone's understanding."* Responses such as this one suggested that the students wanted more cohesion between lecture and the social media supplement.

During the last week of the semester, a post-course survey was administered (Table 1), student grades were collected and survey data was analyzed. There was noticeable positive feedback from LINK students regarding their interactions with the LinkedIn portion of the class. Of particular interest was that, while 55% felt a better connection with their professor, 44% of LINK students did not feel a better connection with their classmates. Students wrote comments on the surveys such as "It is a great way to get involved in the outside world other than the classroom setting and get an outside point-of-view on topics" and "It gives students a chance to actually visualize what they are learning and see other opinions from individuals all over the world." These answers suggest that students felt the involvement with the LinkedIn portion of the class provided them with a different interaction with their material which in turn improved their understanding.

The primary challenge of this study was the small number of participants in both the fall and spring semesters which made statistically meaningful data analysis impractical. A secondary issue was keeping and maintaining student participatory interest and creating a dynamic discussion space. While LINK students were required to participate in the LinkedIn assignments as part of their course grade, some did not participate despite the potential grade penalty. Those who did participate sometimes did not actively engage in the discussions and instead simply wrote the answer to a question but did not explore the content further. While critical thinking and problem-solving skills were reflected by some, they were not reflected by the majority. It was interesting to note that even though they were not participating as much as expected, students still vocalized their affinity toward participating through the LinkedIn site. Similar issues were experienced at

Table 1: Likert Responses for LINK Students (n=26) on a Sub-set of the Post-Course Survey Questions.

Questions	Not Effective			Very Effective
	1 f(%)	2 f(%)	3 f(%)	4 f(%)
1. How effective do you think social media can be when used as a teaching tool in higher education?	1 (3.85)	6 (23.08)	14 (53.84)	5 (19.23)
2. How effective do you think social media can be when used as a teaching tool in equine science classes?	0 (0.00)	7 (26.92)	12 (46.16)	7 (26.92)
3. How effective do you think utilizing social media sites, such as LinkedIn, can be in identifying possible career opportunities?	1 (3.85)	8 (30.77)	5 (19.23)	12 (46.16)
4. How effective do you think utilizing social media sites, such as LinkedIn, can be in attaining a career/job?	0 (0.00)	8 (30.77)	7 (26.92)	11 (42.91)
5. How effective do you feel using LinkedIn as a teaching tool was in this class?	4 (15.38)	10 (38.46)	10 (38.46)	2 (7.69)

interested in employment in the field to experience ideas and discussions about topics in various locations both inside and outside the classroom. While this study did not provide statistically significant data about the effect of social media use in the equine science classroom, it did provide encouraging suggestions that it very well could have an impact on student engagement and a deeper learning experience.

the University of the Free State in South Africa, where Facebook was used as a portion of an Information Systems course (Rambe, 2012). They also faced challenges identified as the development of quality educational discussions, fostering student engagement and levels of deep learning (Rambe, 2012).

There is still skepticism around the use of social media in the classroom by agricultural educators (Settle et al, 2011). Even while the majority of agriculture teachers are using some form of social media in the classroom, these educators are the most opposed to non-Facebook networking sites (such as LinkedIn) because of the questionable educational value (Settle et al, 2011). Further research is necessary to gain a better understanding of the use of these types of networking sites to create a more solid knowledge base for educators.

Also, the way stakeholders (in our case, students) use the internet for educational purposes can range widely (Porr et al, 2014). Stakeholders with questions sometimes find the internet unreliable and are unable to sift through the incredible volume of information available to find valuable and valid sources (Porr et al, 2014). To address this issue, the instructor did not allow incorrect information to exist on the LinkedIn discussion posts and required cited references for information provided by students in the discussion posts. There is also a perceived risk for educators, some of whom believe that these new forms of educational transference could end up replacing them in the long run (Porr et al, 2014).

Summary

This study examined the effect of incorporating a social media site as a teaching tool in equine science classes taught at the college-level. The social media site LinkedIn was chosen because of its professionalism and career opportunities. While social media used in educational settings has been researched frequently, its use as a technologically-advanced supplement within equine science classes has not been documented. The equine industry requires access to current knowledge and management techniques as well as ready access to information from all over the world, making social media an ideal choice for use in the industry as a whole. Using social media in equine science education allows students

There is very limited research on the effect of social media implementation into animal/equine science college curriculum and this study functions as a preliminary look into future possibilities. Implementing a social media site into classes with larger student numbers is crucial to attaining a better understanding of the effects of social media as a learning tool within the animal/equine science context. Also, the utilization of a flipped classroom format in addition to the social media tool could affect the outcome of student satisfaction and engagement. The flipped classroom facilitates student interaction with classroom material (lectures, readings, PowerPoint presentations) outside of class time at their individual speed, which allows in-class time to be utilized for more discussion, interaction and synthesis (Baker, 2013). By using the social media portion in a flipped classroom, social media could become a more effective tool by allowing students and instructors to better utilize class time to create the fluid connection between the course material and in-class experience. With more research, alteration and repetition of this study, further information could be gathered about social media and its impact on the equine science classroom in places of higher education.

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Student Blogs and Journals as Assessment Tools For Faculty-Led Study Abroad Trips¹

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Abstract

Two similar study abroad trips were conducted, with one group of students required to post daily blogs in Australia and the other group completing handwritten journals in Argentina. Observations regarding the two writing modalities are described. The correlations between ratings assigned by faculty evaluators based on blog or journal entries of student achievement of student learning objectives (SLO) and scores assessed by the faculty leaders independently of blog or journal entries were inconsistent (-0.40 to 0.82). Consequently, blogs and journal entries may best be used in conjunction with other tools to determine whether students achieved the SLO. Blog and journal entries on day 1 were compared with entries posted on day 10 to determine whether students improved their use of spelling, punctuation and grammar; increased the amount of reflection evident; and showed more enthusiasm. Students on the Australian trip improved in each area ($P \leq 0.041$), with the greatest improvement in enthusiasm ($P < 0.0001$). Students traveling to Argentina showed improvement only in reflection ($P = 0.029$). While student writing improved with blogging, students in Argentina demonstrated declining effort as they composed journal entries.

Key words: blog, learning objectives, social media, student learning, study abroad

Introduction

Colleges and universities across the country are emphasizing study abroad experiences for undergraduate students (Gibson et al., 2012; Zhai and Scheer, 2002) and Kansas State University's (KSU) College of Agriculture (COA) is no exception. The Department of Animal Sciences & Industry (ASI) alone has offered 20 faculty-led study abroad trips since 2008, with seven trips to English-speaking countries. A total

of 349 students have participated in these experiences and most of the trips have been 10 to 18 days in length. The majority of the faculty leaders of these study abroad experiences have required students to write a report or turn in a journal of reflections on experiences and perceptions during the trip.

Requiring students to write about their experiences helps them achieve several objectives, including improving their writing skills and developing the critical thinking skills that lead to cultural competency (Page and Benander, 2011). As times change and technology evolves, students need to expand their proficiencies into online modules, including social media outlets. Although 72% of college students indicate that they communicate most with friends online (Jones, 2002), 89.1% report that they do not have a blog (Rhoades et al., 2008). Students also need to learn to communicate electronically in a professional manner (Leggette et al., 2011). In a faculty-led study abroad trip to Australia in 2012, KSU students were asked to compile a blog about their experience in lieu of writing traditional journals. Upon return, the blogs were evaluated to determine if they reflected whether students achieved the student learning outcomes (SLO) and if specified components of the blogs improved from the beginning to the end of the trip. Similar comparisons were made regarding a faculty-led study abroad trip to Argentina in 2013 during which students completed a handwritten journal. The intent was not to determine which was better (blogging or journal writing), but to document some observations regarding each.

Materials and Methods

All procedures in this study were determined by the KSU Institutional Review Board to be exempt from review.

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Student Blogs and Journals

Pre-trip Preparation for Australia

A 10-day faculty-led study abroad trip to Australia was offered with an emphasis on beef cattle and sheep. Students ($n = 20$) were required to enroll in ASI 660 Study Abroad/Animal Science in the spring of 2012. This course met for 1 hour per week throughout the spring semester. Students learned about Australia, with an emphasis on the sites they would visit. Students were required to research locations and give graded oral presentations to their classmates. Students were also provided basic travel information, which included their flight and travel itineraries, packing suggestions and passport requirements. The SLO for the course were for students to:

1. Gain direct exposure to many facets of the livestock industry in Australia;
2. Gain awareness of the challenges facing people involved in agriculture in Australia, as well as awareness of the international opportunities that exist between the United States (US) and Australia;
3. Develop an appreciation for the differences and similarities between livestock production systems and management practices in the US and Australia;
4. Become familiar with the diversity of Australian culture and customs; and
5. Increase written communication skills while becoming familiar with the social media outlet of blogging.

One unique aspect of this particular trip compared with others in the department was that students were required to blog about their experiences while they were in Australia. To prepare students for this, one class period was devoted to teaching students about blogging and helping them set up their individual blogs. Nineteen students elected to use Blogger.com (Google) and one student created her blog in WordPress. Before departing, students were required to post three blog entries: one of their choosing on the day they created the blog, a chapter summary from a travel guide about Australia and a summary of in-class presentations.

Pre-trip Preparation for Argentina

The pre-trip preparation for Argentina was similar to that for the Australia trip. A 14-day faculty-led study abroad trip was planned to Argentina, with an emphasis on the Argentinian beef and sheep industries. Students ($n = 19$) on this trip were also required to enroll in ASI 660 and met weekly in the semester prior to the trip (Spring 2013) to learn about Argentina, the sites they would see and international travel in general. The SLO for the course were for students to: 1) gain direct exposure to many facets of the livestock industry in Argentina; 2) gain awareness of the challenges facing people involved in agriculture in Argentina, as well as awareness of the international opportunities that exist between the United States (US) and Argentina; 3) develop an appreciation for the differences and similarities between livestock production systems and management practices in the

US and Argentina; and 4) become familiar with the diversity of Argentinian culture and customs. These were identical to the SLO for students participating on the Australian trip, with the exception of SLO 5, which was only provided to students travelling to Australia.

Blogging Down Under

Students departed for their 10-day trip to Australia on May 21, 2012. The trip included educational stops at abattoirs, ranches, feedlots and a university. The itinerary included planned cultural experiences in Melbourne and Sydney and at the Great Barrier Reef. Students were instructed to post at least 1 blog entry each day. Blogs were to be fewer than 500 words and were to include at least 1 photograph. To assist in the mechanics posting blogs, the faculty instructor took 4 iPads on the trip, all with international data service. Students also were allowed to bring their personal laptop or tablet computers. Students were instructed to compose their blogs in the app Pages or Notes, then copy the entry into their blogs to conserve data usage and prevent students from losing entries if they experienced a loss of connectivity. Students were given a copy of the grading rubric for the blogs and were told to write about what they saw, learned and did. They were instructed that personal impressions should be included in their daily blogs, but no further instruction was given regarding the content of the blog entries. Blogs were each worth 10 points: 5 points for quality of content, 1 point for remaining under 500 words, 2 points for including a photograph and 2 points for completion on each respective day. Students were also required to post a final blog entry about their overall impression of the trip and corresponding course, as well as a final analytical review. In total, blog entries were worth 150 of the 650 total points possible in the class.

Due to major problems with data service and limited wireless internet availability in Australia, students were not able to post their blog entries each day as planned. As a result, the instructor viewed student entries in Pages or Notes to ensure that blog entries had been composed on a given day. When connectivity was available, students uploaded their entries into their blogs. Aside from ensuring that they were completed daily, none of the blog entries were graded while the students were in Australia; the faculty instructor read and assigned point values to the blogs after the trip was completed and when connectivity was reestablished.

Daily Journaling in Argentina

Students departed for their 14-day trip to Argentina on May 20, 2013. Prior to departing for Argentina, blank journals were distributed to all students. The trip included educational stops at ranches, feedlots, sheep operations, dairies, a research station and a tea plantation. The itinerary also included planned cultural experiences in Buenos Aires and a visit to Iguazu Falls. Students were instructed to compose a handwritten journal entry each day. Students were encouraged to include their own personal impressions, rather than just a regurgitation

of the daily itinerary. Little specific instruction was given regarding the length of journal entries. Journals were to be graded on specific details of each farm visit. Personal insight regarding culture, travel, cattle and history were to be addressed. Grammar and spelling were to account for $\leq 10\%$ of the overall journal grade. Journal entries accounted for 100 points of the 500 total points available in the class. While in Argentina, journals were not checked to determine if students were completing the journals daily as instructed or waiting several days before completing their entries. Journals were collected at the conclusion of the trip and graded by the instructor.

Data Collection

After completion of the trips, two independent faculty members with no connection to either course, either group of students, nor the trips themselves completed independent evaluations of the blogs and journal entries. Because the trip to Argentina was longer in duration than the trip to Australia, only the journal entries for the first 10 days of the Argentinian trip were evaluated and all 10 daily blogs of the Australian trip were scored. Evaluators read the 10 daily blogs or journal entries for each student and identified which SLO were specifically addressed in each blog (SLO-#days); for example, the evaluators might note that Student A addressed SLO 1 on days 2, 3 and 7, for a total of 3 days. After determining which blogs addressed each SLO, the independent evaluators also assigned an overall score based on how thoroughly each student appeared to have achieved each SLO in the blogs (SLO-quality). These scores ranged from 1, where the SLO was never addressed, to 10, where the student showed great reflection and appreciation for the SLO. Because the same faculty personnel were assigning both of these scores, they were not assumed to be independent. The faculty leader of each trip also assigned a score ranging from 1 to 10 for how well each student achieved each SLO based on his perceptions during the trip without consideration of blog or journal entries (SLO-instructor).

Aside from evaluating blogs and journal entries for attainment of the SLO, blogs and journal entries were also evaluated for the amount of thought and reflection apparent (REFLECT); the level of enthusiasm communicated (ENTHUSE); and proper use of spelling, punctuation and grammar (GRAM). These evaluations were completed by the same 2 independent faculty members and the faculty leader of each study abroad trip. Scores ranged from 1 to 10 for each category. Only blogs written on days 1 and 10 of the trip were evaluated for these criteria, allowing comparisons to be drawn from the beginning of the trip to the end (or day 10, in the case of the Argentinian trip).

Statistical Analysis

All data were analyzed with SAS (SAS Inst. Inc., Cary, NC). To determine whether any of the variables associated with SLO achievement were related to each other and to final percentage earned in the course

(PERC), Pearson correlation coefficients were calculated within trip between SLO-instructor, SLO-#days, SLO-quality and PERC. The change in the scores assessed for REFLECT, ENTHUSE and GRAM was calculated by subtracting day 1 values from those recorded for day 10. A t-test was used on these values to determine if student performance changed on each trip from day 1 to day 10. Correlations also were calculated between PERC and the improvement for REFLECT, ENTHUSE and GRAM to determine whether independent evaluations of student writing would be reflective of PERC.

Results and Discussion

The faculty-led study abroad trips to Australia and Argentina shared many similarities: both included a semester-long preparation course, focused on the cattle and sheep industries, took place in the spring immediately following the end of the semester, required students to write about their experiences, used SLO 1 through 4 and included approximately the same number of students. There were also differences that could not be controlled. One trip occurred in 2012 (Australia) and the other was in 2013 (Argentina); different students participated in each; and the faculty leader for each trip was different. Thus causation for differences noted cannot necessarily be attributed to blogging or journal-writing alone. Thus statistical comparisons were only made within trip and not across trips.

Student Learning Outcomes

For all SLO, the correlations between SLO-instructor and PERC ranged from 0.38 to 0.55 for students participating in the Australian trip (Table 1; $P < 0.10$). This relationship was even stronger for students traveling to Argentina (Table 2; $P < 0.01$). This was not surprising, as both assessments were completed by the faculty leaders of the trips. Because both faculty leaders were familiar with the students, their performances throughout the semester on various assignments and their conduct while abroad, the faculty leaders knew which students were truly engaged in the course. Those students were most likely to receive greater scores on the SLO-instructor assessments and to earn greater percentages in the courses. The other consistent trend for all SLO on both trips was that SLO-#days and SLO-quality were correlated ($P \leq 0.0012$). This also was not surprising, as the more times a student addressed an SLO throughout the 10 days of blogging or journal writing, the more the faculty evaluators associated a particular student with a specific SLO and thus the greater SLO-quality score they were likely to assess. The two scores assessed by the faculty leaders of the trips (SLO-instructor and PERC) were consistently correlated, as were the two scores assessed by the faculty evaluators (SLO-#days and SLO-quality).

When the scores assessed by the faculty evaluators were compared with those assessed by the course instructors, the results were inconsistent. For the

Table 1. Pearson correlation coefficients (with P-values below) for the Australian trip between instructor's assessment of student (n = 20) attainment of each student learning objective (SLO) without regard to blog entries (SLO-instructor), the number of days that students addressed each SLO in their blog entries (SLO-#days), the faculty evaluators' assessment of each student's overall attainment of each SLO based on blog entries (SLO-quality), and each student's final percentage earned in the course (PERC)

Assessment	SLO 1	SLO 2	SLO 3	SLO 4	SLO 5
SLO-instructor and SLO-#days	-0.16 (0.50)	0.32 (0.18)	0.20 (0.39)	-0.40 (0.082)	0.43 (0.056)
SLO-instructor and SLO-quality	-0.063 (0.79)	0.36 (0.12)	0.13 (0.59)	-0.25 (0.28)	0.51 (0.022)
SLO-instructor and PERC	0.55 (0.013)	0.38 (0.096)	0.40 (0.080)	0.39 (0.088)	0.51 (0.022)
SLO-#days and SLO-quality	0.67 (0.0012)	0.82 (< 0.0001)	0.89 (< 0.0001)	0.79 (< 0.0001)	0.92 (< 0.0001)
SLO-#days and PERC	-0.071 (0.77)	0.51 (0.023)	0.14 (0.54)	-0.29 (0.22)	0.17 (0.47)
SLO-quality and PERC	0.11 (0.64)	0.55 (0.012)	0.28 (0.23)	-0.43 (0.062)	0.30 (0.20)

Table 2. Pearson correlation coefficients (with P-values below) for the Argentina trip between instructor's assessment of student (n = 19) attainment of each student learning objective (SLO) without regard to journal entries (SLO-instructor), the number of days that students addressed each SLO in their journal entries (SLO-#days), the faculty evaluators' assessment of each student's overall attainment of each SLO based on journal entries (SLO-quality), and each student's final percentage earned in the course (PERC)

Assessment	SLO 1	SLO 2	SLO 3	SLO 4
SLO-instructor vs. SLO-#days	0.62 (0.0045)	0.27 (0.26)	0.48 (0.04)	0.48 (0.036)
SLO-instructor vs. SLO-quality	0.82 (< 0.0001)	0.32 (0.19)	0.67 (0.0016)	0.62 (0.0046)
SLO-instructor vs. PERC	0.59 (0.0080)	0.67 (0.0017)	0.64 (0.0034)	0.66 (0.0021)
SLO-#days vs. SLO-quality	0.80 (< 0.0001)	0.93 (< 0.0001)	0.91 (< 0.0001)	0.91 (< 0.0001)
SLO-#days vs. PERC	-0.017 (0.94)	0.24 (0.32)	0.0079 (0.97)	0.36 (0.13)
SLO-quality vs. PERC	0.39 (0.10)	0.24 (0.32)	0.27 (0.25)	0.49 (0.031)

Australian trip, the correlation between SLO-instructor and SLO-#days trended toward significance only for SLO 4 and 5 ($P \leq 0.082$), but in the case of SLO 4, the correlation was negative. The correlation between SLO-instructor and SLO-quality was 0.51 for SLO 5 ($P = 0.022$). The correlation between SLO-#days and PERC was significant only for SLO 2 ($P = 0.023$). The correlation between SLO-quality and PERC was significant for SLO 2 ($P = 0.012$) and trended toward significance for SLO 4 ($P = 0.062$), but this correlation was negative. All other correlations for the Australian trip were small and non-significant. These inconsistencies make it difficult to discern clear patterns between the various observations made by the instructor and the assessments made by faculty evaluators based on blogs alone. Because students were not given instructions to write specifically about the various SLO, it is possible that even those who achieved the SLO might not have conveyed that attainment through their individual blog entries. If blogs are to be used to assess student attainment of SLO, it appears that it would be helpful to give students specific guidelines regarding the content of their blog entries to ensure that the SLO are addressed.

Faculty evaluators' and the faculty leader's assessments of student performance were more consistent for the Argentina trip. The faculty evaluators' assess-

ments of SLO-#days were correlated with the faculty leader's SLO-instructor assessments for SLO 1, 3 and 4 ($P \leq 0.04$). The same SLO (1, 3 and 4) were also correlated when SLO-instructor and SLO-quality were compared ($P < 0.005$). In the case of the Argentinian trip, neither of the faculty evaluators' assessments were correlated with the final percentage earned by students in the course. Because the faculty evaluators' assessments were similar to those assigned by the faculty leader in his SLO-instructor evaluations, it is somewhat surprising that the faculty evaluators' assessments were not correlated with PERC for any of the SLO. This is likely due to other factors influencing student grades aside from SLO attainment alone. Students on this trip also were not specifically instructed to address the various SLO in their journal entries, so this cannot account for the differences noted between the two trips. Perhaps when students felt they were writing their entries for the benefit of the instructor, rather than friends and family members reading the blogs at home, they were more likely to address issues related to the course, rather than simply writing about what they thought others would enjoy reading.

Content and Quality of Entries

When the faculty evaluators and faculty leader of the Australian course independently evaluated the blogs, they detected improvement in every category evaluated from day 1 through day 10 (Table 3). Despite the improvement in each of these categories, in most cases, the correlations between these criteria were small and non-significant (Table 4; $P \geq 0.070$). Although others have reported that survey participants think using social media in the college classroom will decrease quality of communication (Settle et al., 2010), we found the opposite to be true. Students must be provided opportunities to practice writing if they are to improve their skills (Haug, 1996) and perhaps realizing — based on comments posted to their blogs — that friends and family were actually reading their entries encouraged students to put more effort into their blogs. The length restriction of the blog entries also may have reduced intimidation felt by students and aided in focusing their thoughts. While some Argentinian journal entries were lengthy on day 1, very few exceeded 500 words by day 10, however, so brevity of entry does not entirely account for differences noted between trips.

The same trend was not apparent with the journal entries submitted by students participating in the Argentinian trip. From day 1 to day 10, there were

not improvements detected in any of the parameters evaluated and the amount of REFLECT declined. As the trip advanced, the journal entries became progressively shorter. Although the students continued to address some SLO, it was quite apparent that the level of effort put into the journal entries was declining for many students by day 10. The journals were not checked daily, but the faculty leader noted that on some days students appeared to be “catching up” on their journals; in other words, rather than writing about their experiences while they were in recent memory, students would wait several days before they composed journal entries. Without feedback from others (instructor, friends, or family), student motivation to write journal entries appeared to wane as the trip progressed. In the case of this trip, some of these criteria were correlated with one another. REFLECT and ENTHUSE, GRAM and ENTHUSE and GRAM and PERC were all correlated. Essentially, those students who continued to put some effort into their journal entries tended to continue to show more proficiency in all these areas than students who had regressed to short, meaningless entries.

One might expect ENTHUSE to be greater at the beginning and wane throughout the trips as students became more tired, but this was not the case for either trip. Although the level of ENTHUSE held steady for those students in Argentina ($P = 0.22$), those in Australia demonstrated an increase in this parameter ($P < 0.0001$), as evaluated by the faculty evaluators and instructor. Some of this difference might be attributed to the fact that the students in Australia were about to return home while the students in Argentina had 4 days remaining in their study abroad experience. While in Australia, students were receiving comments from family members and friends who were reading and enjoying the blogs from home. This feedback may have motivated students to put more effort into their daily entries. Starting a blog can be overwhelming and frustrating to those not familiar with this form of social media, but students likely gained confidence with each blog entry posted. Students also may have been a bit nervous and apprehensive about the trip on day 1, but by day 10 when they had made good friends and not only survived but also enjoyed the trip, their posts likely reflected this increased comfort level. As a result, the quality of entries improved. Page and Benander (2011) reported that students with highly structured reflections showed more recognition, analysis and synthesis. Providing more guidance about the content of blog entries may have further increased the amount of REFLECT and enhanced the use of blogs to evaluate the attainment of SLO.

Students in Australia showed more improvement throughout the trip in REFLECT ($P = 0.0025$) and ENTHUSE ($P = 0.0003$) than students who turned in handwritten journals following the trip to Argentina. These differences could have been associated with the differing trip duration, the differences between travelling to an English-speaking country and a non-English speaking country, or any number of variables.

Table 3. Least squares mean (LSMEAN) for improvement in scores (1 to 10) regarding reflection and thought (REFLECT); enthusiasm (ENTHUSE); and proper usage of grammar, punctuation, and spelling (GRAM) detected by 3 faculty evaluators from d 1 to d 10 in student blogs (Australia) and journal entries (Argentina)

Factor	Australia		Argentina	
	LSMean	P-value	LSMean	P-value
REFLECT	0.65	0.041	-0.86	0.029
ENTHUSE	1.37	< 0.0001	-0.54	0.22
GRAM	0.53	0.0037	0.17	0.54

Table 4. Pearson correlation coefficients (with P-values below) calculated for the relationships between the improvement detected from d 1 to d 10 in student blogs (Australia) or journal entries (Argentina) by faculty evaluators for amount of reflection and thought (REFLECT); enthusiasm (ENTHUSE); and proper usage of grammar, punctuation, and spelling (GRAM), and the final percentage earned in the course (PERC)

Factor	Australia	Argentina
REFLECT and GRAM	-0.41 (0.070)	0.38 (0.11)
REFLECT and ENTHUSE	0.34 (0.14)	0.88 (< 0.0001)
REFLECT and PERC	0.072 (0.76)	-0.066 (0.79)
GRAM and ENTHUSE	-0.074 (0.76)	0.45 (0.05)
GRAM and PERC	-0.043 (0.86)	0.45 (0.05)
ENTHUSE and PERC	-0.049 (0.84)	0.026 (0.91)

While we cannot determine the cause for these differing observations, differences were detected through the use of student written blogs and journal entries, supporting the use of these as assessment tools.

Blogging, due to the brief nature of entries, is relatively quick to grade compared with more lengthy written journals. The typed blogs eliminate some challenges associated with deciphering handwritten journal entries. Blogging also provides students an opportunity to practice their writing skills with a live and engaged audience. On the other hand, requiring handwritten journals to be turned in at the conclusion of a study abroad trip eliminates concerns about connectivity and technical difficulties. Perhaps daily feedback regarding journal entries would have encouraged students in Argentina to continue to put forward good effort in completing their journal entries, but this would require more micromanagement on the part of the instructor. Had the instructor not checked blog entries daily on the Australian trip, the quality of student effort may have declined by day 10 and students may have procrastinated composing their blog entries. Because the quality of writing produced by college graduates is a concern (Haug, 1996) and is important to recruiters hiring students (Leggette et al., 2011), blogging may be used as a tool to help students develop writing skills and social media competencies that will be valuable to them beyond their college experience. Requiring handwritten journal entries may accomplish the same objectives, but concurrent faculty feedback might be necessary for students to maintain the effort level required to achieve improvement in these areas.

Summary

Daily blog entries and handwritten journal entries by students participating in faculty-led study abroad trips can be valuable tools in evaluating student attainment of SLO when used in conjunction with a faculty leader's assessment. Blog entries may be better-suited to this purpose if students are specifically instructed to write about their experiences relative to each SLO. Students completing handwritten journal entries might benefit from faculty encouragement during a trip to maintain their level of effort by day 10. Blogging, as measured by these evaluations, appeared to stimulate an improvement in written communication skills of these students, as measured by grammar, punctuation and spelling. The amount of reflection and enthusiasm also increased from day 1 to day 10. Thus, despite significant connectivity problems, posting daily blog entries in this format appeared to be useful in improving student skills and in aiding instructors in assessing student achievement of SLO.

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College of Agriculture Faculty Perceptions of Student Skills, Faculty Competence in Teaching Areas and Barriers to Improving Teaching

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Abstract

Demand for educational reform is echoing across the nation. Diverse job markets in a constantly evolving agricultural industry have created a need for college graduates who possess transferrable competencies such as critical thinking, problem-solving and effective communication skills. Land-grant colleges and universities must revitalize their services if they wish to continue preparing the next generation for innovative agricultural careers. A researcher-designed questionnaire was used to describe University of Idaho College of Agriculture faculty perceptions of valuable graduate skills, perceived levels of competence and importance of teaching areas and barriers to improving teaching. Faculty reported high self-perceptions in traditional areas of teaching such as lecturing and identified student engagement and critical thinking skill development as the most important aspects of teaching. Teaching areas in need of the most professional development included student engagement and improving reading and writing. Barriers to improving teaching included lack of time and resources as well as limited emphasis and recognition of teaching in the promotion and tenure process. Further research is needed to evaluate student learning and skill attainment, improve faculty teaching and address barriers that hinder the promotion of quality undergraduate education.

Introduction

An evolving agricultural industry and the expansion of diverse career opportunities have spurred renewed interest in the quality of undergraduate education within colleges of agriculture. Additionally, the demand for educational reform is echoing across the nation (Arum and Roksa, 2011; Bok, 2006; Boyer,

1990; National Research Council, 2009; Selingo, 2013). *"Urgent change is required in agriculture education... so that the agriculture graduates of tomorrow will have the skills and competencies to meet the needs of a changing workplace and world"* (NRC, 2009, p. 25). Institutions of higher education are faced with unprecedented pressure to deliver students a quality educational experience (Selingo, 2013). Public perception holds that realistic experiences and skills are not reflected in higher education and students are not adequately prepared to meet the demands of advanced agricultural job markets (Campbell, 1998; NRC, 2009).

Fulfilling the educational needs of students is the most important responsibility of higher education institutions (Arum and Roksa, 2011; Bok, 2006; Campbell, 1998; NRC, 2009). College graduates who possess practical competencies such as critical thinking, problem-solving, analytical reasoning and effective communication skills will be met with an array of career opportunities in the many fields of agriculture (NRC, 2009). A growing concern among employers is graduates leaving universities without adequate critical thinking abilities (Whittington et al., 1997). After interviewing a wide range of employers, Selingo (2013) found that while specialized skills are desirable, employers want to hire individuals who can adapt and learn quickly. Students must be prepared to be broad thinkers capable of solving the world's problems rather than technical specialists (Acker, 1999).

In order to improve the quality of undergraduate education in America, teachers must provide their students with opportunities to actively engage in the learning process (Arum and Roksa, 2011; Bok, 2006; Estep et al., 2012; NRC, 2009). Rote memorization and

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passive acquisition of knowledge should be replaced with experiential educational strategies that “teach students how to learn throughout their lives and careers and to present a more systems orientated, holistic view of agriculture” (Acker, 1999, p. 51). Faculty members need to implement active learning opportunities that teach students to think for themselves and challenge them in the effort to develop critical thinking skills and require students to engage in careful reasoning and analysis (Bok, 2006).

In his seminal work *Scholarship Reconsidered: Priorities of the Professoriate* (1990), Ernest L. Boyer questioned the practices of faculty, related to their duties in research and teaching. He described the shift in priority toward research in institutions of higher education at the expense of quality teaching and student learning. The NRC (2009) echoed this concern by admitting that teaching and learning are central to academic institutions, however; faculty are not adequately evaluated or rewarded based on teaching. Increased pressure to publish as a means to gain academic status is causing some professors to devote less time and effort to quality teaching (Arum and Roksa, 2011; Boyer, 1990; Kenny, 1998; NRC, 2009).

In 1998, the Boyer Commission published a report consisting of specific recommendations on how to restructure the undergraduate educational experience in America’s research universities. The report urged research universities to capitalize on their inquiry-based roots and engage students in active rather than passive learning. The Boyer Commission report further called upon the unique character of research universities; “In a setting in which inquiry is prized, every course in an undergraduate curriculum should provide an opportunity for a student to succeed through discovery-based methods” (Kenny, 1998, p. 26). Several research studies aimed at identifying College of Agriculture faculty members’ knowledge of teaching competencies found that participants were most confident in traditional pedagogies such as effective lecturing, preparing teaching materials, graduate advising and clarity in teaching. Lowest levels of knowledge were reported for less traditional competencies such as alternative teaching activities, using cooperative learning and case studies, distance education basics, undergraduate advising and teaching large class sizes (Harder et al., 2009; Stedman et al., 2011; Wardlow and Johnson, 1999).

Harder et al. (2009) computed mean weighted discrepancy scores (MWDS) for a variety of teaching competencies where a positive MWDS indicated the need for training in that area. The results highlighted a need for professional development in: getting students engaged in learning, teaching critical thinking, questioning techniques and active learning strategies. Critical thinking and active learning were specifically identified as two crucial components to quality education (Bok, 2006; Estep et al., 2012; NRC, 2009).

Foster and Pikkert (1991) offered insight as to why professors may struggle with the incorporation of these

particular competencies; they postulated that faculty may not be equipped with the knowledge or resources needed to integrate critical thinking skill development because of the limited preparation in pedagogy and educational concepts.

Purpose/Objectives

The purpose of this quantitative research study was to describe faculty perceptions related to quality indicators of undergraduate education. Survey research was utilized to describe faculty perceptions of valuable graduate skills, perceived levels of competence and importance of teaching areas and barriers to improving teaching within the College of Agriculture at the University of Idaho. The objectives for this research study included:

1. Identify skills deemed important by faculty for graduates to possess.
2. Describe faculty members’ self-reported levels of perceived competence in selected teaching areas.
3. Describe faculty members’ perceived importance of selected teaching areas.
4. Describe the discrepancy between faculty members’ self-reported levels of competence and importance in selected teaching areas.
5. Describe faculty members’ perceived barriers to improving teaching within the college.

Methods

A researcher-designed questionnaire, distributed through SurveyMonkey®, was used to collect the data. The questionnaire consisted of four parts; respondents’ perceived value of graduate skills, respondents’ competence and self-reported level of importance of teaching competencies, barriers to improving teaching and respondent background and demographic information. As the number of faculty members was relatively small and perceptions of a group can vary from person to person, the researchers conducted a census. A list of all faculty members was received from the dean’s office and cross-referenced with departmental directories to ensure accuracy. Prior to the collection of data, exempt certification for human subject participation was acquired from the University of Idaho’s Institutional Review Board (IRB project number 13-009).

The framework of desired skill sets that graduates should possess was provided by the National Research Council’s (2009) national report. Additional specific skills, pertaining to each skill set, were identified through the relevant literature. Participants used a six-point scale (1 = No Value; 6 = Very Strong Value) to rate their perceived level of value for each skill. The Borich (1980) model of needs assessment was used to measure participants’ perceptions related to their competence and perceived importance of 17 selected teaching competencies. “The needs assessment model is essentially a self-evaluating procedure which relies on teachers’ judgments about their own performances” (Borich, 1980, p. 42). These competencies were identified through a review of literature from similar studies (Harder, et al., 2009;

Stedman et al., 2011; Wardlow and Johnson, 1999; Wingenbach, 2002). Participants used a six-point scale (1 = Extremely Little Competence/Importance; 6 = A Great Deal of Competence/Importance) to rate their level of competence and perceived importance of each teaching competency. Face and content validity of the instrument were established by a panel of experts including Agricultural Education faculty and the Associate Dean.

Data collection in Spring 2013 followed the Tailored Design Method (Dillman et al., 2009). Five points of contact were made. A pre-notice letter was mailed to participants, followed by an email notice sent two days later with a link to the questionnaire. Two reminder emails were sent to non-respondents at one week intervals followed by a final paper-mail delivery to conclude data collection. A total of 197 college faculty members were asked to participate in this study. Of those, 116 participants indicated that they did not teach any undergraduate courses and were removed from the frame. Of the 77 faculty in the target frame, 70 completed the questionnaire for a response rate of 90.9%. The researchers determined that non-response error was not a critical threat due to the low number of non-respondents ($n = 7$). Reliability of the instrument was assessed using the Cronbach's alpha internal consistency reliability coefficient. Cronbach's alpha was used to measure homogeneity of the items for graduate skills, competence in teaching ability, importance of teaching areas and barriers to improving teaching with values of $\alpha = 0.89, 0.88, 0.88$ and 0.83 respectively.

Descriptive statistics were used to describe the data. Following the needs assessment model, mean weighted discrepancy scores (MWDS) were calculated using an Excel-based MWDS calculator (Microsoft 2010, v 14.0) created by McKim and Saucier (2011). Discrepancy scores were calculated for each respondent by subtracting his/her perceived level of competence from the perceived level of importance for each teaching competency. Each discrepancy score was then multiplied by the average for perceived importance of that item. The sum of the weighted discrepancy scores were divided by the total number of respondents; thus providing a MWDS for each competency. Positive MWDS signified a need for professional development training.

Results

Faculty responded to demographic items to describe the population and the environment in which they teach. Faculty in this study ranged in age from 31 to 68 years old with an average of 49.23 years of age. Forty-eight respondents (73.8%) were male and 17 were female (26.2%). Of those participating, 64.7% were tenured and 35.3% were untenured. There were 4 lecturers/instructors (6.0%), 4 senior lecturers/instructors (6.0%), 15 assistant professors (22.4%), 18 associate professors (26.9%) and 26 full professors (38.8%). The majority of participants believed they were moderately (42.4%) to well prepared (31.8%) for teaching at the college level.

The average number of credits taught by faculty was 8.61 per school year.

Faculty reported their appointment percentage; teaching accounted for the highest average percent ($M = 39.4, SD = 27.9$). Research accounted for an average of 33.4% of faculty appointments while an average of 12.8% of appointments were dedicated to extension. One participant reported having a 100.0% extension appointment but did teach an undergraduate course thus he/she was included in the study. Service and administration represented 6.0% and 8.3% of faculty appointments, respectively.

To describe the conditions for teaching in the college, faculty were asked to report their perceptions of the value that promotion and tenure committees place on appointment areas. These findings are presented in Table 1. The majority of faculty perceived that research was most valued by promotion and tenure committees ($M = 58.8, SD = 27.1$). The perceived average value of research was 25.4% higher than the actual research appointment average of faculty members ($M = 33.4, SD = 25.3$). The opposite effect was seen for the difference between actual teaching appointment and the perceived value of teaching. According to faculty perceptions, the value of teaching ($M = 25.9, SD = 21.8$) is 13.5% lower than the average faculty appointment ($M = 39.4, SD = 27.9$). The remaining three appointment areas were closer in regard to actual appointment percentage and perceived value.

Table 1. Faculty Appointment Percentage vs Perceived Value by P and T Committees

Item	Actual Percentage		Perceived Percentage	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Teaching	39.4	27.9	25.9	21.8
Research	33.4	25.3	58.8	27.1
Extension	12.8	26.9	8.40	14.7
Service	6.00	8.90	3.00	4.10
Administration	8.30	22.1	3.80	17.8

Note. *M* = Mean, *SD* = Standard Deviation

Participants were asked to describe their interests in research versus teaching. They were also questioned about their perceptions regarding the priorities of their department in terms of research and teaching. These findings are reported in Figure 1. None of the participants indicated that their interests or their department's priority leaned exclusively toward research. Likewise, no participants believed their department prioritized only teaching. However, 4.3% ($n = 3$) of participants confirmed that they were exclusively interested in teaching. Thirty-two percent of participants ($n = 22$) stated that they had equal levels of interest between research and teaching and yet only 14 participants (20.3%) believed that their department prioritized the two equally. Thirteen participants (18.8%) indicated that they were mainly interested in teaching and the same number believed that their department mainly prioritized teaching. The discrepancy between interest and department priority increased for "mainly research" and "slightly leaning toward research." Only eight participants (11.6%)

indicated that their interests leaned slightly toward research whereas 23.2% of respondents (n = 18) believed the same of their department. Twelve participants (17.4%) stated that their interests lied mainly in research compared to 16 respondents (23.2%) that said their department mainly prioritized research.

The first objective of this study was to identify skills deemed important for graduates to possess. Faculty perceived all skills to be valuable. These data are presented in Table 2. Problem-solving skills was seen as the most valuable (M = 5.66, SD = 0.56) skill. Critical thinking (M = 5.59, SD = 0.81) and the ability to communicate effectively in written form (M = 5.59, SD = 0.65) were the next most valuable skills as perceived by faculty. The ability to work in diverse communities (M = 4.71, SD = 1.05) and possessing a multicultural awareness (M = 4.69, SD = 1.05) were less valued compared to the majority of other skills. However, a similar diversity skill, interacting with people of different backgrounds, was deemed more valuable (M = 4.97, SD = 0.99). Only one skill, conflict resolution (M = 4.65, SD = 1.00), received a mode score of 4 (Moderate Value). Managing a budget (M = 4.63, SD = 0.81) was the least valuable skill according to faculty.

The second and third objectives were to describe faculty members' self-perceived level of competence and importance for teaching competencies. The fourth objective was to calculate mean weighted discrepancy scores (MWDS) for each competency to identify professional development needs. The findings for objective two, three and four are presented in Table 3. Participants were asked to rate their competence in a variety of different teaching areas. Faculty were most confident in their lecturing abilities (M = 5.17, SD = 0.79); nearly all faculty (98.5%) felt competent in this area. In addition to lecturing, faculty reported high competence in using assignments that are tied to real-life problems (M = 5.04, SD = 0.97). Faculty felt moderately competent in all remaining teaching areas. Participants were least competent in using web-based technologies for managing courses (M = 3.97, SD = 1.48).

According to participants, getting students engaged in learning was the most important area of teaching (M = 5.40, SD = 0.99). Encouraging critical thinking skill development (M = 5.35, SD = 0.75) and using assignments that are tied to real-life problems (M = 5.31, SD = 0.76) were also perceived as highly important. The remaining competencies were perceived as moderately important. Teaching in multicultural classrooms (M = 3.97, SD = 1.89) and using web-based technologies for managing courses (M = 3.97, SD = 1.27) were perceived as least important among the selected teaching competencies.

Mean Weight discrepancy scores were calculated to identify areas where professional development is

Fig. 1. Ecopedagogy Module Performance: Comparison of Phase 1 (draft) versus Phase 2 (final) Presentations of Student Teachers.

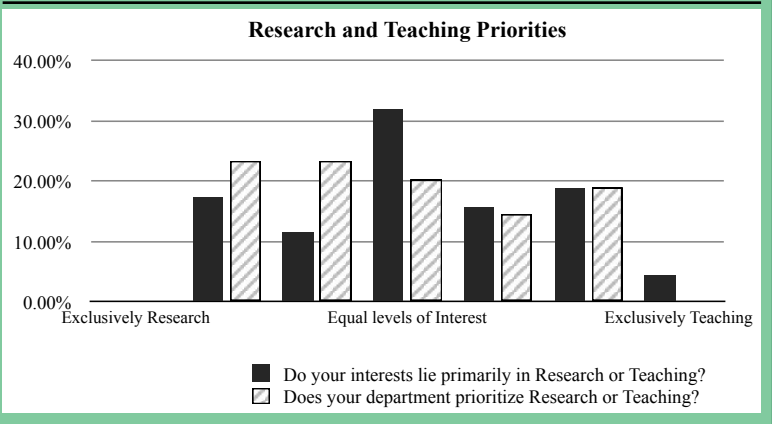


Table 2. Faculty's Perceived Value of Graduate Skills

Item	M	SD	Mo
Possess problem-solving skills	5.66	0.56	6.00
Possess the ability to think critically	5.59	0.81	6.00
Communicate effectively in written form	5.59	0.65	6.00
Communicate effectively in speech	5.51	0.70	6.00
Make ethical decisions	5.40	0.87	6.00
Possess decision-making skills	5.37	0.60	5.00
Engage in evidence-based reasoning	5.36	0.89	6.00
Interpret data and make correct inferences	5.07	0.94	5.00
Work as part of a team	5.06	0.88	5.00
Interact with people of different backgrounds	4.97	0.99	5.00
Manage complex tasks	4.91	0.85	5.00
Work across a variety of disciplines	4.81	0.92	5.00
Have a basic understanding of statistics and probability	4.78	0.88	5.00
Possess leadership abilities	4.76	0.88	5.00
Possess management skills	4.72	0.87	5.00
Work in diverse communities	4.71	1.05	5.00
Possess a multicultural awareness	4.69	1.05	5.00
Possess conflict resolution skills	4.65	1.00	4.00
Manage a budget	4.63	0.81	5.00

Note. M = Mean, SD = Standard Deviation, Mo = Mode, 1 = No Value, 2 = Very Little Value, 3 = Little Value, 4 = Moderate Value, 5 = Strong Value, 6 = Very Strong Value

warranted. Getting students engaged in learning had the highest MWDS (MWDS = 3.87) indicating the highest need for faculty professional development training. Other MWDS above 2.0 included improving student reading/writing (MWDS = 3.08), teaching to a variety of different learning styles of students (MWDS = 2.43) and encouraging critical thinking skill development (MWDS = 2.32). The lowest MWDS were calculated for lecturing (MWDS = -1.89), using technology in teaching (MWDS = -1.51) and creating course syllabi (MWDS = -1.50).

The fifth objective was addressed by asking participants to review a list of barriers and rate the degree to which each one affects their ability to improve their teaching. These data are presented in Table 4. Lack of time (M = 4.71, SD = 1.42) was reported as the largest barrier to improving teaching. Faculty reported that lack of resources (M = 4.12, SD = 1.40), lack of emphasis on teaching in the tenure and promotion process (M = 3.94, SD = 1.51) and lack of recognition or rewards for teaching (M = 3.81, SD = 1.48) also represented major barriers to improving teaching. Participants indicated that the remaining items did not represent strong barriers. The majority of faculty disagreed that lack of education (M = 3.00, SD = 1.50) and lack of training (M = 2.97, SD = 1.37) were barriers.

Sixteen percent of participants agreed that lack of motivation ($M = 2.26$, $SD = 1.20$) served as a barrier. Likewise, 11.5% indicated that their lack of interest to engage in professional development activities ($M = 2.13$, $SD = 1.20$) was a barrier. An open-ended question was provided for participants to reflect on additional barriers that were not included in the questionnaire. Faculty reported limited departmental funding for professors to attend professional development activities as a barrier to improving their teaching. Lack of student preparedness for university level learning was also identified as a barrier. One respondent reflected on the issue with the "pipeline," in which high school students are not being adequately prepared for college thus hindering progress for higher education.

Discussion

Faculty in this study perceive that their teaching is less valued by promotion and tenure than their actual teaching appointment. According to the NRC (2009), a common perception is that "tenure criteria are strongly tilted toward faculty members' research productivity and that too little attention is paid to teaching and service" (p. 60). The participants in this study shared similar views in regard to the discrepancy of value between research and teaching within CALS. While teaching accounted for the largest percent of faculty appointments, an overwhelming perception existed that promotion and tenure committees placed greater value on research productivity. The perceived focus on research was inconsistent with faculty interests. The majority of respondents indicated that their interests leaned slightly toward teaching activities. However, when asked to describe their departments' priorities, participant responses shifted toward research. Deans and decision makers should consider teaching as a part of scholarship; it takes time and effort to create the environment required to facilitate real-world application of content and foster critical thinking in their students. Teaching is scholarly (Boyer, 1990) and faculty who excel in teaching should be rewarded and recognized. Although the impacts of teaching may not be as immediate as those of research, they are no less influential.

Faculty were asked their perceptions regarding the importance of graduates' skills. All skills were deemed important, the most valuable being problem solving, critical thinking and writing. These findings support the National Research Council's report (2009) and indicate that faculty value skills that will make students success-

ful in agricultural careers. It is the responsibility of higher education institutions to prepare the next generation workforce for a demanding future (Bok, 2006; Campbell, 1998; Estep et al., 2012; NRC, 2009). The NRC (2009) recommended that the skills be "integrated throughout a curriculum and other student experiences rather than taught in separate courses" (NRC, 2009, p. 40). Further study should include an analysis of student competence in these skills upon graduation from a degree program and a comparison to the perceptions of employers related to graduate proficiency in these skills. Faculty should purposefully plan where and how students will attain these skills; keeping in mind that valuable skills may be attained in out-of-course experiences such as student organizations, study abroad opportunities and student leadership opportunities.

Higher education has a momentous responsibility when it comes to preparing the nation's future workforce. College students "desperately" (p.184) need real-world experience that will help them connect the concepts from class to everyday problems in their future careers (Selingo, 2013). According to faculty, the most valued skills for graduates to possess included problem-solving skills, critical thinking and communication skills both in speech and written form. While these particular skills stood out as especially valuable, participants considered all the listed skill sets to be moderately important for graduates to possess.

Table 3. Faculty Competence, Importance, and Mean Weight Discrepancy Score of Teaching Areas; ranked by MWDS

Teaching Area	Competence		Importance		MWDS
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Getting students engaged in learning	4.68	0.97	5.40	0.99	3.87
Improving student reading/writing	4.06	1.01	4.76	1.02	3.08
Teaching to a variety of different learning styles of students	4.30	1.16	4.81	1.05	2.43
Encouraging critical thinking skill development	4.91	0.88	5.35	0.75	2.32
Using peer evaluations to improve teaching	4.06	1.25	4.45	1.07	1.76
Discussion-based instruction	4.49	1.31	4.79	1.11	1.55
Using assignments that are tied to real-life problems	5.04	0.97	5.31	0.76	1.28
Hands-on problem-solving activities	4.81	0.97	4.95	1.00	0.73
Questioning techniques	4.52	0.99	4.60	1.06	0.34
Using Web-based technologies for managing courses	3.97	1.48	3.97	1.27	0.18
Cooperative learning (group projects or assignments)	4.44	1.16	4.46	1.25	0.13
Using student evaluations to improve teaching	4.17	1.20	4.21	1.31	0.12
Teaching in lab settings	4.69	1.31	4.67	1.33	-0.41
Teaching in multicultural classrooms	4.19	1.18	3.97	1.89	-0.64
Creating course syllabi	4.78	1.08	4.43	1.14	-1.50
Using technology in teaching	4.51	1.16	4.12	1.33	-1.51
Lecturing	5.17	0.79	4.76	1.01	-1.89

Note. *M* = Mean, *SD* = Standard Deviation, MWDS = Mean Weighted Discrepancy Score, 1 = Very Little Competence/Importance, 6 = A Great Deal of Competence/Importance

Table 4. Barriers to Improving Teaching Reported by Faculty

Item	<i>M</i>	<i>SD</i>	<i>Mo</i>
Lack of time	4.71	1.42	6.00
Lack of resources	4.12	1.40	4.00
Lack of emphasis on teaching in the Tenure and Promotion process	3.94	1.51	4.00
Lack of recognition or rewards for teaching	3.81	1.48	5.00
Lack of knowledge and understanding of alternate teaching approaches	3.29	1.47	4.00
Large class sizes	3.20	1.43	3.00
Student resistance to change	3.20	1.37	3.00
Lack of education relating to teaching	3.00	1.50	3.00
Lack of training related to teaching	2.97	1.37	3.00
Lack of motivation	2.26	1.20	1.00
Lack of interest to engage in professional development	2.13	1.20	1.00

Note. *M* = Mean, *SD* = Standard Deviation, *Mo* = Mode, 1 = Strongly Disagree, 2 = Slightly Disagree, 3 = Disagree, 4 = Agree, 5 = Slightly Agree, 6 = Strongly Agree

The participants reported being most competent in their ability to lecture and use assignments that are tied to real-life problems. Previous researchers found that agricultural and life science faculty were also the most confident in their ability to lecture (Harder et al., 2009; Stedman et al., 2011; Wardlow and Johnson, 1999). Competency areas in which faculty in this study rated themselves as having low competence included using web-based technology for course management, utilizing peer evaluations and improving student reading and writing. Low competence in improving reading and writing raises a concern considering that effective communication was rated as one of most valuable skills that graduates should possess (Arum and Roksa, 2011; Campbell, 1998; NRC, 2009). According to Campbell (1998), a “common concern expressed by employers of our graduates is their lack of proficiency in communications, both written and spoken” (p. 110). The NRC (2009) recommended that instructors encourage better communication skill development by providing students with opportunities to speak and write about a variety of topics in their coursework.

The proficiency of teaching faculty needs to be thoroughly evaluated in order to create an accurate picture of the current status of undergraduate education in colleges of agriculture. An overwhelming majority of faculty in this study reported high levels of competence in the ability to lecture. Faculty members were less confident in their ability to actively engage students in the learning process. Research strongly suggests that lecturing alone is not enough to promote active learning and the development of critical thinking skills (Arum and Roksa, 2011; Bok, 2006; Kenny, 1998; Selingo 2013; Wood, 2003). “Education by inquiry demands collaborative effort; traditional lecturing should not be the dominant mode of instruction in a research university” (Kenny, 1998, p. 25). Professional development opportunities should be offered to faculty related to pedagogical knowledge to help them adopt techniques that will promote active student learning.

Several options to better promote the importance of quality teaching have been suggested: providing incentives to reward quality teaching, creating tenure-track positions dedicated to educational research, focusing on applicants’ teaching abilities during the hiring process and implementing professional development workshops to improve teaching (Boyer, 1990; Estep et al., 2012; Kenny, 1998; NRC, 2009). The Boyer Commission recognized the importance of establishing a better balance between research and teaching excellence. Regardless of the difficulties associated with effectively evaluating teaching productivity at the college level, it is imperative that more attention be paid to teaching considerations during the hiring process and promotion and tenure decisions.

According to Arum and Roksa (2011), the National Survey of Student Engagement recommended several examples of active learning strategies including class presentations, questioning techniques and the

implementation of collaborative work among students both in and outside of class. Encouraging faculty to adopt an experiential approach to teaching could help college of agricultural and life science instructors to become more effective in their teaching (Estep et al., 2012). Further research is recommended to examine the instructional strategies used by professors in their classrooms. A detailed investigation should be conducted that compares skill development of students to the teaching techniques and cognitive discourse used by professors.

Faculty perceived the following teaching competencies as most important: student engagement, critical thinking skill development and using assignments tied to real-life. Competencies ranking low, but still moderately important included using web-based technologies for course management, teaching in multicultural classrooms and using technology in teaching. It is interesting to note the lack of emphasis devoted to technology in education. According to Selingo (2013), online and hybrid courses are becoming a reality for institutions of higher education. While online education won’t replace traditional classrooms anytime soon, it will play a growing role by giving students more options to fit with their own educational goals. Further investigation into whether faculty are prepared for this online movement and whether they are receptive to participate in professional development training designed for technology-based instruction would be beneficial.

In addition to utilizing technology in the classroom, teaching in multicultural settings also received a relatively low importance ranking. In regard to skills needed by graduates, faculty ranked similar diversity skills comparatively low. Possessing a multicultural awareness and the ability to work in diverse communities was ranked nearly last by respondents in terms of value. As Harder et al. (2009) postulated, “Perhaps classes in CALS are culturally homogeneous or possibly CALS faculty do not perceive teaching a class of diverse learners requires specific strategies” (p. 54). Regardless, the NRC (2009) believed in the importance of training students to work and speak across traditional disciplinary and cultural boundaries. Workplaces are constantly evolving and becoming more diverse and in order to succeed in these environments and students should be encouraged to gain multicultural awareness.

The results of the mean weighted discrepancy scores (MWDS) identified several teaching areas in need of professional development training. Faculty rated their level of competence below perceived level of importance for well over half of the competencies. Student engagement in learning, reading and writing improvement, teaching to a variety of learning styles and encouraging critical thinking all received high MWDS signifying areas most in need of training. There is strong evidence to support the use of active engagement in teaching environments as a means to improving student learning (Arum and Roksa, 2011; Bok, 2006; NRC;

2009). It was suggested that active learning results in longer term recollection of subject matter compared to lecture-based instruction (Bok, 2006). Although utilizing web-based technology had a low MWDS, it may bear further study to address faculty competence in these areas as well as why they view it as unimportant. Lecturing was also a competency that may benefit from further investigation. Faculty report a higher level of competence than importance, yielding a negative MWDS. However, the literature is critical of lecturing as a stand-alone pedagogy and caution faculty to use it more sparingly (Bok, 2006; Wood, 2003).

Two areas of concern were identified with regard to barriers that instructors face to improve their teaching. Lack of time and resources were the top-ranked barriers according to participants. The next most common theme included barriers relating to recognition of quality teaching by administrators. Lack of emphasis on teaching in the promotion and tenure process and lack of recognition or rewards for teaching rounded out the top four barriers to improving teaching.

Faculty disagree that interest, motivation and education are barriers to improving training. It appears that the barriers are not created by the faculty, but rather the establishment of higher education. Allowing faculty the time and resources to improve teaching, as well as rewarding quality teaching, are factors that can be influenced by the climate of the teaching faculty and leadership in the college. Evaluating teaching appropriately is critical and recognizing achievements in teaching should move away from a competitive process as the ultimate goal is student achievement. The aim of teaching should be to develop skills and impact student success, leading to an improved agricultural industry.

Summary

College of Agricultural and Life Sciences faculty should take action to improve the quality of undergraduate education by addressing the following concerns. First, faculty claim to appreciate the need for students to acquire transferrable skills throughout college but it is unclear whether students are securing the knowledge and skills they need to be successful. Further research is needed to evaluate student learning; are students leaving college with practical competencies such as critical thinking, problem-solving and effective communication skills? In order to ensure that students develop the skills they need in today's agricultural workforce, College of Agricultural and Life Sciences faculty must address problem areas in their teaching such as student engagement, reading and writing improvement and teaching critical thinking. A follow-up study should be conducted to investigate how to evaluate and improve these areas of teaching. Finally, the barriers to improving teaching identified in this study should be examined further to find possible solutions.

Colleges and universities nationwide are falling short of employer expectations in regard to the preparation of graduates. "More than 90% of employers rate written

communication, critical thinking and problem solving as 'very important' for the job success of new labor market entrants," (Arum and Roksa, 2011, p. 143) and yet only a small percent of graduates are excelling in these areas. If higher education is going to regain public trust, it must embark on a path of reform to restore our education system.

Land-grant institutions were created in response to the desperate needs of society and what society needs now is for higher education to adapt to the demands of a new-age workforce. As Campbell (1998) stated over a decade ago, "The problem is not that these institutions are doing so much wrong but that they have failed to take full account of the changes occurring in the society they serve" (p. 192). In order to implement the changes needed in higher education, it will take a combined effort on behalf of the students, faculty, departments and universities as a whole. The land-grant community needs to commit to a pathway of educational reform by revitalizing their services to increase academic rigor, stimulate higher learning and improve teaching within colleges of agricultural and life sciences.

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Undergraduate Students' Perceptions of Academic Advising

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Abstract

Academic advising is an essential element of a college system that can help students solve their academic problems and succeed in their academic and professional careers. Higher education institutions have used students' assessments to gauge teaching effectiveness and academic advising. The goal of this study was to seek students' input about academic advising and solicit suggestions to improve it. The specific objectives of the study were to conduct a decade-long assessment of students' perspectives of academic advising and to ascertain whether students' perceptions of academic advising differ by their demographic characteristics and academic years. The results of online surveys conducted from 2005 to 2013 show that, overall, the respondents were positive about academic advising services. The newer and female students tended to be more satisfied with academic advising than the older and male students. Respondents indicated the need to improve advising related to participation in volunteer and study abroad programs. Strengths and weaknesses of academic advising specific to the College of Agriculture and Natural Resources (CANR) at Michigan State University are discussed here together with suggestions for improvements.

Introduction

Academic advising is an essential element of a college system. Colleges offer academic advising to inform students about academic requirements, to help students find resources (educational and others) and to familiarize them with college cultures. Academic advising is also considered important for students' professional success. Drake (2011) states that advisors guide students to negotiate the higher education maze, to make effective and thoughtful decisions about their futures, to adapt their life skills to the new academic

world and to cultivate the academic skills and knowledge needed to succeed. Increasing student-faculty contact, encouraging active learning, exchanging prompt feedback and emphasizing time on task are some of the good practices of undergraduate education (Chickering and Gamson, 1987) that could be fostered through good academic advising. Examining how advising service is offered and how useful students perceive and find advising for their academic and professional careers is of interest to colleges, advisors and parents who are interested in their sons' and daughters' success. No one else could assess academic advising better than the firsthand consumers, college students themselves.

Soliciting students' input to improve college education is a common phenomenon. Research shows that students report their activities accurately and their judgments of educational experiences are consistent, reliable and valid (Higgins et al., 2002). Colleges can use students' perceptions of their academic experiences as indicators of college and departmental excellence in teaching and advising (Shrestha, 2009). Several studies show that students' retention in college is directly related to their experience in and satisfaction with academic advising (Noel-Levitz Inc., 2006). Students' dissatisfaction with academic advising, career counseling and job placement services has also been reported (Kotler and Fox, 1995; Saenz and Barrera, 2007). Examining results from an institutional perspective has been the focus of many past studies (Corts et al., 2000). Academic advising and mentoring, however, which make a significant contribution to students' academic and personal development, have not been fully examined.

This study is based on the theories on student development posited by Astin (1984), Tinto (1987) and Terenzini and Pascarella (1991). Astin (1984) argues

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that students' proficiencies (academic and other) depend on how they interact or are involved in college and how often they interact with faculty members. He argues that availability of faculty members, student affairs professionals and resources is essential for students to develop. Tinto (1987) stresses that students come from a variety of socioeconomic backgrounds and they depart college when they do not feel at home at college or find college welcoming to them. Colleges must intentionally help those students integrate socially and intellectually with the culture of the college by creating opportunities for extracurricular activities, informal student interactions and faculty-student interactions. Thus, academic advising to students remains an essential component of college education.

Terenzini and Pascarella (1991) emphasize the need to assess the effect of faculty help and advising in students of various demographic backgrounds. Students' feedback on academic programs will help college administrators, department heads and faculty members design new courses, improve existing course curricula and implement academic programs effectively. Shrestha (2009) studied students' perceptions of advising at MSU with only a few years' data. To understand advising better, a study with a wider data range was deemed necessary. This study was conducted to fill these information gaps.

Objectives

The overall purpose of this study was to assess students' perceptions about and solicit suggestions to improve academic advising in the CANR. The specific objectives were to assess the trends of academic advising in the CANR at MSU over the past nine years and examine students' perspectives of academic advising by their demographics and academic years.

Methods

The undergraduate students in the CANR at MSU were the population of interest for this study. This study used data obtained from online surveys of undergraduates in the CANR conducted from spring 2005 to spring 2013. The MSU Institutional Review Board approved the protocol for the study and deemed it exempt. The survey instrument for this study was developed by the Center for Evaluative Studies at MSU and was reviewed by the academic advisors within the CANR before data collection. The students' perceptions about academic advising were assessed by 10 statements measured on a Likert scale rating where 1 equated to "strongly disagree" and 5 equated to "strongly agree." The statements covered such aspects as advisor accessibility, advisor knowledge and helpfulness, encouragement of students in academic and professional growth and providing timely information for the successful education of students. Statements about academic advising were adapted from the student evaluation of advising form developed by Zimmerman and Mokma (2004). A Cronbach's alpha coefficient

calculated to determine the reliability of the survey instrument pertaining to items for academic advising was 0.93.

There were also open-ended questions in the survey asking students to write about the strengths and the weaknesses of academic advising and make suggestions to address the gaps.

The online survey was sent to all the undergraduate students registered for the spring semester each year from 2005 to 2013 during the last week of March and remained active until the end of April of the same year. Three follow-up reminder emails were sent along with a link to the survey within two weeks after the first survey was sent. As an incentive, survey participants were provided with a two-scoop ice cream coupon to encourage participation. The survey yielded an aggregate response rate of 24% which is typical to Internet survey with college students.

Various statistical procedures were employed to analyze and summarize the data. Besides descriptive statistics (frequency, mean and standard deviation), independent t-tests were calculated to determine the differences in students' perceptions by their gender, ethnicity, residence and residency status. Analysis of variance (ANOVA) (F-test) was used to determine differences between students' perceptions of advising by their academic years. The cut-off point for significance was set at 0.05.

Results

A total of 4,875 CANR undergraduate students – freshmen (15%), sophomores (24%), juniors (42%) and seniors (19%)—participated in the online surveys. Males and females accounted for 35% and 65%, respectively. The majority (86.2%) of the respondents were white. The remaining 13.8% non-white students comprised Hispanics, African Americans, Asian Americans, Native Americans and others. More than half (57.2%) of the respondents were from suburban or urban areas and 42.8% of the respondents were from rural areas. Nine out of 10 respondents were in-state (Michigan) and 9.4% of respondents were out-of-state including international students. In general, respondents in this study were similar to the overall population of CANR students except for gender. The percentage of female students responding to this survey was slightly higher than the proportion of females in the population, so gender differences, if any, may need to be interpreted with caution.

Student Perceptions of Academic Advising

Overall, students reacted positively (4.14 ± 0.96) to the academic advising they received from their respective advisors (Table 1). The students' rating of academic advising in the CANR is above the undergraduates' ratings (3.34) of academic advising at the University of California, Davis (Hunziker, 1991). Nonetheless, there was a marginal drop in ratings of all aspects of academic

Table 1. Responses about Student's Perceptions of Academic Advising.^a

	Year of Survey (N)									
	2005 (225)	2006 (495)	2007 (520)	2008 (779)	2009 (619)	2010 (516)	2011 (549)	2012 (561)	2013 (488)	Nine- year average (4765)
	Mean(SD)									
My major advisor is easily accessible.	4.19 (0.94)	4.22 (0.85)	4.15 (0.99)	4.08 (0.92)	4.10 (0.88)	4.26 (0.87)	4.22 (0.91)	4.32 (0.85)	4.21 (0.92)	4.19 (0.89)
My major advisor gives me accurate information about degree requirements.	4.25 (0.86)	4.19 (0.85)	4.25 (0.83)	4.11 (0.90)	4.13 (0.94)	4.29 (0.81)	4.25 (0.88)	4.32 (0.84)	4.29 (0.88)	4.22 (0.87)
My major advisor helps me with academic problems.	4.10 (0.87)	4.03 (0.89)	4.00 (0.97)	3.94 (0.96)	3.97 (0.97)	4.13 (0.92)	4.09 (0.96)	4.13 (0.92)	4.14 (0.91)	4.05 (0.94)
My major advisor refers me to helpful resources when I need them.	4.08 (0.88)	4.07 (0.87)	3.99 (0.95)	3.96 (0.92)	4.00 (0.95)	4.10 (0.88)	4.11 (0.93)	4.18 (0.87)	4.14 (0.96)	4.06 (0.92)
My major advisor provides timely information on internship opportunities.	3.98 (0.92)	3.98 (0.90)	3.84 (1.02)	3.88 (0.92)	3.97 (0.94)	4.07 (0.92)	4.08 (0.96)	4.14 (0.88)	4.05 (0.96)	4.00 (0.94)
My major advisor encourages me to participate in internships.	4.04 (0.88)	4.00 (0.87)	3.89 (1.03)	3.90 (0.96)	3.94 (0.94)	4.11 (0.89)	4.11 (0.94)	4.22 (0.83)	4.12 (0.90)	4.03 (0.93)
My major advisor encourages me to participate in study abroad.	3.77 (0.92)	3.77 (0.91)	3.70 (1.00)	3.53 (1.02)	3.59 (1.03)	3.72 (1.01)	3.84 (0.97)	3.86 (0.99)	3.85 (0.96)	3.72 (0.99)
My major advisor encourages me to participate in volunteer programs.	3.40 (0.91)	3.59 (0.96)	3.52 (1.04)	3.41 (0.98)	3.43 (0.97)	3.60 (0.98)	3.69 (1.00)	3.77 (0.97)	3.72 (1.0)	3.57 (0.99)
My major advisor shares information on career opportunities.	3.99 (0.92)	3.97 (0.89)	3.88 (1.00)	3.84 (0.98)	3.88 (0.95)	4.01 (0.93)	4.02 (0.97)	4.17 (0.84)	4.05 (0.95)	3.97 (0.94)
Overall, I am satisfied with the academic advising services I have received.	4.21 (0.86)	4.19 (0.88)	4.10 (0.99)	4.00 (1.02)	4.05 (1.00)	4.22 (0.93)	4.14 (0.97)	4.27 (0.87)	4.18 (0.96)	4.14 (0.96)

^aScale: 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, and 5 = strongly agree.

Table 2. Independent t-test Results of Academic Advising by Demographics.

Statements		Male (n=1,638), Female (n=3,058)			White (n=4,032), Non-white (n=393)			Rural (n=2,004), Urban (n=2,688)			In-state (n=4,247), Out-of-state (n=443)			
		M ^a	t value	p value	M ^a	t value	p value	M ^a	t value	p value	M ^a	t value	p value	
My major advisor is easily accessible.	Male	4.16	1.343	0.180	White	4.20	1.685	0.090	Rural	4.20	0.653	0.510	In-state	4.20
	Female	4.20			Non-white	4.13			Urban	4.18			Out-of-state	4.13
My major advisor gives me accurate information about degree requirements.	Male	4.20	1.366	0.170	White	4.23	1.226	0.220	Rural	4.21	1.044	0.300	In-state	4.23
	Female	4.24			Non-white	4.18			Urban	4.24			Out-of-state	4.21
My major advisor helps me with academic problems.	Male	3.98	3.500	0.000	White	4.06	1.446	0.150	Rural	4.05	0.187	0.850	In-state	4.05
	Female	4.08			Non-white	3.98			Urban	4.05			Out-of-state	4.01
My major advisor refers me to helpful resources when I need them.	Male	4.02	2.601	0.010	White	4.07	0.963	0.340	Rural	4.07	0.567	0.570	In-state	4.07
	Female	4.09			Non-white	4.03			Urban	4.06			Out-of-state	4.05
My major advisor provides timely information on internship opportunities.	Male	4.04	2.403	0.020	White	4.00	0.015	0.990	Rural	4.00	0.290	0.770	In-state	4.00
	Female	3.97			Non-white	4.00			Urban	3.99			Out-of-state	3.98
My major advisor encourages me to participate in internships.	Male	4.07	2.379	0.020	White	4.04	1.986	0.050	Rural	4.04	0.433	0.670	In-state	4.03
	Female	4.01			Non-white	3.95			Urban	4.02			Out-of-state	4.00
My major advisor encourages me to participate in study abroad.	Male	3.67	2.650	0.010	White	3.73	1.194	0.230	Rural	3.73	0.257	0.800	In-state	3.71
	Female	3.75			Non-white	3.67			Urban	3.72			Out-of-state	3.82
My major advisor encourages me to participate in volunteer programs.	Male	3.49	4.169	0.000	White	3.56	0.730	0.470	Rural	3.54	1.496	0.140	In-state	3.56
	Female	3.61			Non-white	3.60			Urban	3.59			Out-of-state	3.71
My major advisor shares information on career opportunities.	Male	4.01	2.103	0.040	White	3.97	0.467	0.640	Rural	4.00	1.768	0.080	In-state	3.98
	Female	3.95			Non-white	3.95			Urban	3.95			Out-of-state	3.94
Overall, I am satisfied with the academic advising services I have received.	Male	4.13	0.540	0.590	White	4.15	1.801	0.070	Rural	4.14	0.168	0.870	In-state	4.15
	Female	4.14			Non-white	4.06			Urban	4.14			Out-of-state	4.09

^aScale: 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, and 5 = strongly agree.

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advising services from 2007 to 2009 in the CANR at MSU. The lowest scores were found for statements pertaining to advisors' role to help students to participate in volunteer (3.57 ± 0.99) and study abroad programs (3.72 ± 0.99).

Students' Perceptions of Academic Advising by Demographics

Students' perceptions of academic advising were analyzed by demographic characteristics. Independent t-test results revealed that female students felt more positively than male students about four statements on academic advising—advisors helping with academic problems ($p < 0.001$), advisors referring to helpful resources when needed ($p < 0.05$), advisors encouraging participation in study abroad program ($p < 0.05$) and advisors encouraging participation in volunteer programs ($p < 0.001$) (Table 2). Male students rated interactions with advisors more favorably in providing timely information on internship programs ($p < 0.05$), encouraging participation in those internships ($p < 0.05$) and sharing information on career opportunities ($p < 0.05$) (Table 2).

White students perceived advisors' encouragement to participate in internships more positively ($p = 0.05$) than non-white students did. No differences were found between rural and urban students in their perceptions of academic advising. Out-of-state students' perceptions about advisors' encouragement to participate in study abroad ($p < 0.05$) and volunteer program ($p < 0.001$) were more positive than in-state students' were. Though non-significant, in-state students had a higher overall rating on academic advising.

Students' Perceptions of Academic Advising by Academic Years

Freshmen tended to hold more positive and different perceptions about academic advising services than seniors (Table 3). As students climb the academic ladder, their ratings of academic advising tend to decline. Freshmen rated academic advising higher than seniors on each of the following statements: my advisor gives me accurate information about degree requirements ($p < 0.01$), my major advisor helps me with academic problems ($p < 0.01$), my major advisor encourages me to participate in study abroad ($p < 0.001$) and, overall, I am satisfied with the academic advising services I have received ($p < 0.01$). Although non-significant, seniors' rating of advisors providing timely information on internship opportunities was the highest (4.04 ± 1.0). Juniors and seniors shared similar reactions to academic advisors' encouragement of participation in internships (4.05 for each).

Discussion

College of Agriculture and Natural Resources (CANR) undergraduate students are generally satisfied with the academic advising services they received from the college over the past nine years, but they wanted more support and encouragement from their major advisors about participation in study abroad and volunteer programs. Except for advisors providing accurate information about degree requirements, however, perceptions to all other advising services saw a marginal decline from 2007 to 2009, though students' perceptions of academic advising were still positive. The perceptions improved again from 2010. What exactly led to the decline in perceptions of advising is not clear, though this could have been a reflection of the change in academic administration in the college within this period.

Among the four demographic traits tested, residence (urban, rural) was the only trait where students had the same overall perception ratings to academic advising. Regardless of residence, students maintained similar attitudes toward academic advising services.

Table 3. Responses on Students' Perceptions of Academic Advising by Academic Year.

Statements	Academic status (N):		Mean	F value	p value
	freshman (735), sophomore (1,129), junior (1985), senior (907)				
My major advisor is easily accessible.	Freshman		4.23	1.208	0.305
	Sophomore		4.20		
	Junior		4.19		
	Senior		4.15		
My major advisor gives me accurate information about degree requirements.	Freshman		4.33	5.010	0.002**
	Sophomore		4.23		
	Junior		4.21		
	Senior		4.17		
My major advisor helps me with academic problems.	Freshman		4.15	3.975	0.008**
	Sophomore		4.05		
	Junior		4.03		
	Senior		3.99		
My major advisor refers me to helpful resources when I need them.	Freshman		4.12	2.286	0.077
	Sophomore		4.08		
	Junior		4.05		
	Senior		4.01		
My major advisor provides timely information on internship opportunities.	Freshman		3.96	1.058	0.366
	Sophomore		3.98		
	Junior		4.00		
	Senior		4.04		
My major advisor encourages me to participate in internships.	Freshman		3.97	1.873	0.132
	Sophomore		4.01		
	Junior		4.05		
	Senior		4.05		
My major advisor encourages me to participate in study abroad.	Freshman		3.85	9.865	0.000***
	Sophomore		3.76		
	Junior		3.70		
	Senior		3.60		
My major advisor encourages me to participate in volunteer programs.	Freshman		3.61	2.594	0.051
	Sophomore		3.57		
	Junior		3.59		
	Senior		3.49		
My major advisor shares information on career opportunities.	Freshman		3.93	0.410	0.746
	Sophomore		3.98		
	Junior		3.97		
	Senior		3.97		
Overall, I am satisfied with the academic advising services I have received.	Freshman		4.21	4.393	0.004**
	Sophomore		4.17		
	Junior		4.13		
	Senior		4.05		

** and *** significant at $p = 0.01$ and 0.001 , respectively, using one-way ANOVA test.

Male students rated academic advising lower than female students and most of the differences, except for two statements, were statistically significant. This finding supports Russel et al.'s (2008) stand that students' perceptions of advising differ by gender. Our finding is also consistent with that of Sax et al. (2005), who reported more frequent and positive interactions between female students and faculty members. Our results differ from those of Afshar and Dhiman (2008), however, who reported that female students' ratings on academic advising were lower than those of their male cohorts.

In the MSU study, younger students tended to be more positive about academic advising than older students and there were more young female students than male students in the CANR. This could be the reason for higher ratings of advising by female students.

White students perceived academic advising more positively than non-white students. This finding is not consistent with Strayhorn (2008), who found that African American high achievers were more satisfied with academic advising experiences than white students.

Students who live close by their families and friends while at college -- for example, in-state students -- may opt out of study abroad (Li et al., 2013) because the perceived costs of attending study abroad outweigh the perceived benefits. Students' understanding of volunteer programs could be similar. Colleges need to make extra efforts to encourage these students to join study abroad and volunteering programs. These could be the reasons that in-state students' ratings were lower to study abroad and volunteering programs.

Though the difference was not significant, in-state students felt more positive toward all advising services except those about study abroad and volunteering. It is possible that in-state students are more knowledgeable about the college, the college cultures and the courses than out-of-state students and they are more affirmative about the academic advising. Students coming from out-of-state and from out-of-country have to overcome several challenges. It is a huge transition for students to start college life in a completely new country or a new state. Some students may even experience sociocultural shock and the biophysical environment may be strange and unwelcoming for others. It takes time for them to adjust to the college culture. Advising services offered by colleges to freshmen and especially to out-of-state/international students become crucial for their smooth transition to college life. Orientations through student organizations also can be invaluable to new students to help them learn about and get acquainted with the college systems.

Students' perceptions of advising about participation in study abroad improved over the years, from 3.77 in 2005 to 3.85 in 2013. The higher ratings on study abroad may be attributed to MSU's good reputation for study abroad programs. The rating on volunteer programs also improved, from 3.40 in 2005 to 3.72 in 2013. Ratings on study abroad and volunteering were lower throughout

the study period than ratings on other variables, however. These findings suggest that the CANR needs to organize more informational meetings and provide more support for study abroad and volunteer programs.

Freshmen were more positive about academic advising than seniors and these findings are consistent with those of Afshar and Dhiman (2008) and Hester (2008). However, our findings contradict those of Russel et al. (2008), who reported no differences in perceived satisfaction with academic advising by class levels. Soria (2012) reported that the satisfaction of freshmen with college staff/advisors is positively predictive of their retention in college. High quality academic advising negatively influences students' attrition (Metzner, 1989). Positive ratings of academic advising by freshmen indicate a reduced attrition vis-a-vis increased retention of students in the college.

To examine the academic advising services in the CANR further, students were asked to write about strengths and weaknesses of academic advising and make suggestions to improve this service. Some of the strengths of academic advising that students mentioned are good communication between advisors and advisees, advisors were accessible, advisors were flexible and advising helped students get internship opportunities and prepared them to get jobs after graduation. Students felt the need for advisors to have up-to-date information to share with students.

One student wrote: "...they [CANR departments] have a very strong, supportive and eager to help faculty and advising program.... The advising program is also very helpful, they are constantly sending out emails about job offerings and internships." Other respondents wrote: "She [advisor] was willing to be flexible to allow me to take certain classes that I was interested in and was always very encouraging."; "He [advisor] is so helpful and really gets to know his students so that he can direct them correctly in course selection and internships. He has really helped me find out what I want to do after graduation...." Some students expressed strengths of academic advising, such as: "The adviser ... is extremely helpful to the students and always makes sure that we have all the information she gets about internships, scholarships, etc..."; "The advisors are very helpful.... They also give a lot of advice and information regarding internship opportunities. They work hard to help ensure you are ready for a career after college and that you have a job." These experiences of students support the concept that effective academic advising helps students connect with the people (Swanson, 2006), become involved in research, find internships and secure jobs after graduation. Along the same line, a freshman wrote: "I am just a freshman here and I already have an internship with one of the largest companies in the world, you can't get that anywhere else. The connections I have gained and will gain before graduation will help me when I enter the workforce here in about 3 years. The strengths of this College are the ability to get involved with hands-on research that actually has an impact, the

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ability to gain connections in the field and the experience level of those teaching our courses."

Some of the weaknesses of academic advising that students mentioned included: advisors are unorganized, they do not have up-to-date information, advisors are very busy, advisors do not communicate well to students and advisors are unwelcoming and non-responsive. Few students shared dissatisfactions with academic advising, such as, *"Sometimes...the advisers are burnt-out from their classroom responsibilities and do not have any desire or energy to put towards advising students and building relationships with them...some advisors would much rather handle things over e-mail than meet face to face... this leads to communication errors and misinterpreted questions/answers."* Other weaknesses students mentioned are: *"There has been countless times where I have sent emails regarding classes and have gotten no response. This is not just her fault; every time I meet with her in person, her phone and computer are blowing up with calls. It's not fair to her or the students to spread advising so thinly. I have not met a satisfactory adviser at MSU in the past four years ... has come as close to it as anyone will, but if she continues to be spread so thinly, students will continue with less guidance than needed."* Two problems mentioned here are unwillingness of the advisor himself/herself and unpreparedness of the college to effectively mobilize its human resources. This highlights the role of college management in academic advising.

Respondents offered a number of suggestions to improve advising: promoting effective teaching and advising in college, having more than one advisor available for each degree program, reaching the freshmen more and helping them with their problems, more communication between students and advisors and effective delivery of messages, use of e-mails and websites in communication and regular evaluation of academic advising services.

Summary

Undergraduates were positive about academic advising and the ratings on all academic advising services have been improving. However, respondents differed in their perception of advising by gender, residence and academic year, with female, in-state and freshmen students feeling more positive about advising. Respondents also indicated that advisors needed to be organized and communicate more frequently with the students. Further, they felt a need for better advising about study abroad and volunteer programs, which could help them prepare for jobs. These results lead to the following recommendations.

First, colleges should strengthen the advising services promoting study abroad programs. Academic advisors could articulate the benefits of participating in study abroad program and provide information on various programs. They could offer orientation programs providing information about the types of study abroad programs offered, possible sources of funding for study abroad

and the programs with the best fit for their academic majors.

Second, volunteering enriches students' job exposure and work skills and so helps students attain their career goals. Volunteering can also enhance networking with employers and other stakeholders. Low ratings on advising about opportunities for volunteering suggest that college management may need to explore ways to promote volunteerism. It may help find organizations that accept student volunteers and encourage students to connect with these organizations.

Third, colleges should explore further to understand why males, non-white students and seniors were less positive about advising. Advisors may need to schedule additional follow-up meetings with these students to ensure adequate academic advice. To remain current with the students' advising needs and improve advising, colleges may need to evaluate their advising services periodically. Fourth, advisors should be interested in and committed to understanding their advisees' needs and be prepared to advise students accordingly. We urge colleges to recognize and sustain advising services of their faculty members. Colleges can solicit advisors' inputs about and suggestions to improve academic advising. Increased communication between students and advisors would also bolster advising.

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Evaluation of Undergraduate Equine Related Internship Experience by Students and Employers¹

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Abstract

Internships are one mechanism industry and educational institutions combine efforts to assist young adults in preparing for professional careers. To ensure internships served their intended purpose, student's perceived value of their internship experience was evaluated; employers evaluated the interns as well. University of Nebraska-Lincoln Animal Science undergraduate majors are highly encouraged but not required to complete an internship. Between 2007 and 2012, 18 students enrolled in an equine related internship. The type of equine operation ranged from horse training (n=7), equine focused veterinary clinics (n=6) and equine extension (n=5). Most students strongly agreed the learning plan and journal were beneficial and provided a structured, detailed, planned internship with specific goals and expectations. In a post-internship survey, students ranked highest: they learned new information (4.68 + 0.67), it was a beneficial experience (4.57 + 0.77) and new techniques/methods were learned (4.53 + 1.08). Also, they strongly agreed the experience provided them the opportunity to explore a potential career (4.61 + 0.70) and they had increased first-hand knowledge of careers available in their area of interest (4.11 + 1.13). Finally, supervisors rated all students very high on all competencies related to workplace abilities, interpersonal skills and professional conduct.

Introduction

The mission of the Animal Science undergraduate program at the University of Nebraska is to educate qualified, motivated students in the animal sciences which are equipped to succeed in professional animal agriculture careers. Academic programs strive to prepare graduates for continued personal and professional growth through life-long learning. They also aim to provide undergraduates experiences and training to develop interpersonal skills so they may become leaders in their various communities. University faculty collaborate with industry through internships to help prepare students for successful careers. Internship

experiences have been shown to provide students experiential learning opportunities to apply concepts, knowledge and skills gained through their undergraduate academic program to real world situations as they connect theory with application to the industry (Peffer, 2012). These experiences provide students invaluable opportunities for career exploration and exposure to various aspects of the industry.

The demographics of agricultural undergraduate students have changed over the past 20 to 25 years to include a greater number of students from urban and suburban backgrounds (Dyer, et al. 1996; McNamara, 2009; Scofield, 1995) who have diverse levels of experience (Lawrence, 1987; Pratt-Phillips and Schmitt, 2010). Also, many animal science departments have indicated an increase in students interested in companion animals and horses (Scofield, 1995; Moore et al. 2008; Peffer, 2011). With these changes and students lack of hands-on experience, internships are an even more valuable tool to enhance student's practical experiences and experiential learning. Even though a student's previous equine experience has been shown to have a minimal impact on their performance in introductory equine lecture classes (Pratt-Phillips and Schmitt, 2010), it is still critical for students to gain hands-on experience and technical skills to be marketable and credible in the equine industry. Furthermore, it has been recommended that students need exposure to real life experiences through off-campus equine internships to enhance their marketability in the equine industry (Jorgan and Herring, 2007). In an evaluation of a two-year equine degree program, Long and Morgan (2010) concluded that for students to be successful in equine industry careers, they needed hands-on experiences to enable them to apply course work to their careers.

To ensure internships served their intended purpose, this paper was prepared to determine student's perceived value of their internship experience as well as employer's evaluation of the interns.

¹This study was deemed exempt by the University of Nebraska Institutional Review Board.

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Methods

Animal Science majors at the University of Nebraska-Lincoln (UNL) are highly encouraged to complete an internship, but are not required. The UNL Animal Science internship program is highly flexible and students may participate in an internship experience during any semester. The number of credit hours earned is dependent upon the number of hours/weeks the student is engaged in the internship. Students can earn between 1 credit hour (3 weeks on site) or up to 6 credits for 60 weeks. Animal Science faculty are identified to mentor internship students in their areas of expertise. Students are ultimately responsible for identifying and locating their internship, however resources are available to locate internships which include UNL Animal Science website, Husker Hire Link, faculty advisors and previous industry contacts.

To receive credit for an internship, the student must 1) identify a faculty member as the instructor; 2) complete an Animal Science Contract form; 3) enroll in the internship course (ASCI 395); and 4) successfully complete all assignments as identified in the Animal Science Contract form. Each individual faculty instructor determines the means of assessment of each internship and basis for grade assignment. Consultation with an academic advisor and completion of an internship contract (<http://animalscience.unl.edu/ANSCUndergraduateFormsDirectory>) is required for each student. The contract identifies the supervisor, number of credits to be earned and includes a learning plan which is customized to the specific internship. Included in the learning plan are specific goals, objectives, a general description of the internship and specific requirements which must be completed such as a journal, oral presentation and summary paper. This learning plan provides the framework for the scope and intellectual growth expected of the student from the experience. The contract and learning plan are to be made available to the internship supervisor.

Students participating in equine related internships for course credit are required to 1) maintain a journal; 2) present a follow-up oral presentation; and 3) complete an evaluation. Throughout their internship experience, equine related internship students are expected to maintain a journal and document their daily duties, plus highlight special situations that occur. At the conclusion of the internship, a detailed report reflecting on their experience and value of the experience is submitted. Furthermore, an oral presentation followed by questions and answers is conducted for all students who participated in an equine related internship. Satisfactory completion of the report and presentation are required to earn academic credit for the internship.

At the conclusion of the internship, all equine students were asked to complete a paper-based survey to evaluate their experience and preparedness. The survey was designed using a 5 point Likert-type scale (5 = strongly agreed to 1 = undecided) with questions designed to assess students perceived benefits of the

learning plan, what they gained from the experience, how prepared they were, skills gained, etc. Additionally questions were directed on the specific type of internship the student had participated in such as extension, industry, teaching or research. In addition, students were provided the opportunity to respond to "open ended" questions related to how they became interested in the position, courses which benefited them, would they recommend this to others, how to improve the experience and did it meet their expectations.

A similar paper-based survey tool was developed for employers/supervisors to evaluate students at the conclusion of the internship. The survey was mailed to each employer and was designed to provide feedback by employers on the students professionalism, work habits, quality of work, strengths and weaknesses and if they were prepared for the position using a similar 5-point Likert-type scale (5 = excellent to 1 = poor). Also employers were provided the opportunity to respond to "open ended" questions related to if they would re-hire students, how the experience could be improved and did the students meet their expectations. Descriptive statistics were compiled for the results of both the student intern and employer surveys.

Results and Discussion

All University of Nebraska Animal Science students must enroll in 4 hours of "experiential learning" credit which can be earned in a variety of classes such as judging teams, teaching assistants, extension assistants, research assistants, study tours and internships. Between 2007 and 2012, 18 students enrolled in some type of equine related internship. The type of equine operation ranged from horse training (n=7), equine focused veterinary clinics (n=6) and equine extension (n=5). The average number of credit hours enrolled in was 2.33 and they ranged between one to four credits. All interns completed a contract and 100% indicated the responsibilities and requirements were clearly identified. Nearly all interns, 94.4% (n = 17/18) completed a written report and 72.2% (n = 13/18) gave an oral presentation at the conclusion of their internship. There were 5 students who participated in extension type internships which were under the direct guidance of UNL Animal Science faculty who worked daily with the interns. Thus, due to the nature of the internship and direct faculty supervision it was decided both the oral presentation and/or learning plan were not required to determine the final evaluation and grade.

It is the responsibility of the intern to communicate with their supervisor the designated requirements for them to earn academic credit when on the internship. Supervisors were asked to indicate if a student had 1) completed the learning plan; 2) kept a journal; 3) completed a post-internship paper; and 4) given an oral presentation. Of the 13 supervisors who responded to the evaluation survey, 69.2% (n = 9/13) indicated there were aware the intern had completed a learning plan. Furthermore, 84.6% (n = 11/13) indicated the students

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had completed a post-internship report, 83.3% (n = 10/12) were aware the students completed an oral presentation on their experience and 71.4% (n = 10/13) knew the students were required to maintain a journal throughout the internship.

Communication between supervisor and intern is vital to maintaining the educational aspect of internships. The goal of an internship is for the students to learn and grow and not to be just another “employee.” In response by employers on how to improve the experience, most indicated a greater understanding of the expectations of the employer and requested more feedback on what the students gained from the experience.

For the internship to capitalize on the learning potential and move beyond doing a “job”, internship programs require structure that ensures the work experience is combined with intentional learning that is both self-directed and self-reflective (Katula and Threnhauser, 1999; Ryan and Cassidy, 1996). The development of a customized, specific learning plan is key to ensuring this intentional learning for students (VonDras and Miller, 2002). It was reported by DeVuyst (2006) that developing specific learning objectives encourages more active participation in learning, assists students in clarifying individual goals and increases experiential learning. Also, the concluding oral presentation and final report guide the student reflection of the experience. Students identify the technical and social skills they used and/or acquired, previous academic knowledge that contributed to their success, plus areas they feel were inadequately prepared for (Peffer, 2012).

Most students strongly agreed the learning plan was a useful tool and it was beneficial in outlining what was expected of them during the experience (Table 1). Furthermore, students felt it was beneficial to maintain a journal throughout the duration of the internship (mean score = 4.68/5.0). These responses are in agreement with previously reported reflective internship surveys (Heinemann, et al., 1991; Ciofalo, 1989). These authors noted the importance of having a well-structured, detailed, planned internship with specific goals and objectives based on pedagogy of experiential learning. Also, Sterns, et al. (2005) indicated the importance of specifically identifying the role of the intern and outlining duties and responsibilities which challenge and engage the intern.

At the conclusion of the internship, students were asked to complete an overall self-reflective survey on what they gained from the experience, how prepared they felt they were for the internship and the benefits to career exploration derived from

the internship (Table 2). In regards to overall benefits of the internship, the highest mean scores were related to new information learned (4.68 + 0.67), the internship being a beneficial experience (4.57 + 0.77) and learning new techniques/methods (4.53 + 1.08). However, the scores for how much they learned ranged from 5 (strongly agree) to 1 (undecided) indicating much variation between the internship experiences of the students. This broad range of scores may be related to the diverse background of the student interns and their amount of previous experience. Nearly half of the students employed at equine veterinary clinics and horse training facilities would be considered to have had a moderate to high level of hands-on horse experience whereas the other students would be characterized to have had minimal previous industry experience. Also, interns strongly agreed the experience provided them the opportunity to explore a specific career (4.61 + 0.70) and gain an increased understanding of various potential careers related to their interests (4.11 + 1.13). These results indicate the overall educational impact for students participating in an internship. Similarly, others have reported various tangible benefits for students that successfully completed internships such as higher starting salaries (Gault et al., 2000), greater job satisfaction (Divine et al., 2007; Gault et al., 2000), more post-graduation employment opportunities (Divine et al., 2007) and increased occupational related skills (Divine et al., 2007). Furthermore, other internship studies have indicated the experience to be highly valuable to students when making career decisions and the potential for full-time employment (Peffer, 2012).

These data indicate the internship experiences for equine students have been successful and effective and have added value to student’s educational experience. Furthermore, these internships have provided a link between theory and practice as indicated by students agreeing their academic program helped them

Table 1. Student Responses Regarding the Value of the Internship Assessment Tools (n=18)^z

	Mean ^y	Standard Deviation	Minimum	Maximum
The journal was beneficial throughout the experience period	4.42	0.74	3.0	5.0
The learning plan was a useful tool	4.40	0.74	3.0	5.0
The learning plan was beneficial outlining the expectations for the experience	4.33	0.82	3.0	5.0

^zSurvey responses listed in descending order of mean score.

^yScale used: 5=Strongly Agree, 4=Moderately Agree, 3=Agree, 2=Disagree, 1=Undecided, 0=Does Not Apply

Table 2. Student Responses Regarding the Internship Learning Objectives (n=18)^z

	Mean ^y	Standard Deviation	Minimum	Maximum
Much new information was obtained	4.68	0.67	3.0	5.0
This experience provided me greater career exploration	4.61	0.70	3.0	5.0
This was a very beneficial experience	4.58	0.77	3.0	5.0
New techniques/methods were learned	4.53	1.08	1.0	5.0
I chose this experience to broaden my experiences beyond what traditional courses can offer	4.53	1.03	1.0	5.0
I have a greater understanding of potential careers in this area	4.11	1.14	1.0	5.0
My academic program helped prepare for this experience	3.83	0.86	2.0	5.0
The instructor/coordinator helped prepare me for this experience	3.50	0.82	2.0	5.0
I was poorly prepared for this experience	2.00	0.00	2.0	2.0

^zSurvey responses listed in descending order of mean score.

^yScale used: 5=Strongly Agree, 4=Moderately Agree, 3=Agree, 2=Disagree, 1=Undecided, 0=Does Not Apply

prepare for the internships (3.83 + 0.86) and they chose the experience to broaden themselves beyond traditional courses (4.53 + 1.03). Thus, the experience has provided experiential learning opportunities for students to apply concepts, knowledge and skills gained in their academic program to real world situations. Also, nearly all indicated their equine related internships were paid positions. It has been reported that students with greater technical skills and those perceived to be highly motivated often received higher internship salaries (Bennett-Wimbush and Amstutz, 2011).

Students that participated in off-campus equine industry internships (veterinary clinics, horse trainers, etc.) derived many benefits from their experiences (Table 3). Most indicated new skills were obtained (4.65 + 0.99), they could relate what they learned in their academic program to the industry (4.47 + 0.72) and they had the necessary skills required for the internship (4.29 + 0.92). Additionally, most indicated greater communication skills were developed (4.41 + 0.87). The equine industry internship students varied greatly in their previous experience. It could be speculated their diverse backgrounds had an influence on the benefits derived from the internship. Previous reports of equine related internships indicate they provide opportunities to gain experience and exposure to alternative industry practices, techniques and resources (Bennett-Wimbush and Amstutz, 2011). Similarly, Sterns, et al. (2005) reported the major benefits of a legislative internship were the application of course material to real-life experience, networking with various parties and acquiring new skills. Other interns have indicated increased maturity as they often work away from home and learn to live and work independently (Kirwan, et al., 2002).

Students who participated in equine extension internships were involved with multifaceted extension planning and implantation of workshops, contests and other equine events. They took leaderships and responsibility for planning events, developing resources and dealing with various issues as they arise. All students who participated in equine extension internships indicated a much greater understanding of the role of extension in providing education to horse enthusiasts (Table 4). Furthermore 100% strongly agreed their level of understanding of extension's role and delivery means was greatly increased through the internship. It was intended that the increased first-hand experience obtained during the internship encourages students to seek extension type

positions. Of the 5 interns responding to this survey, 4 did seek extension related positions following graduation. Similarly, undergraduate students participating in an extension forestry educational program unanimously agreed the internship was meaningful and they were highly interested in careers related to the environmental education and extension (Kirwan, et al., 2002).

Employers were asked to evaluate the interns on a variety of competencies related to workplace abilities, interpersonal skills and professional conduct (Table 5). Students were rated very high on all areas evaluated with ability to follow directions (4.89 + 0.32) and dependability (4.84 + 0.37) being the highest. Employer comments were very positive on all students and 100% indicated they would hire the student again and the students met with their expectations. Furthermore, all supervisors indicated the students were prepared to be successful in the internship.

Previous studies have reported both supervisor and student intern ratings between 4.2 and 4.8 on the 5-point Likert scale, with students consistently rating their performance higher than their supervisors rating (McDonough et al., 2009). However, Bennett-Wimbush

Table 3. Student Responses Regarding the Value of Equine the Industry Internships (n=13)^z

	Mean ^y	Standard Deviation	Minimum	Maximum
I learned new skills that will enhance my future career	4.65	0.99	1.00	5.00
I can better relate information in courses to the industry	4.47	0.72	3.00	5.00
I had the skills necessary to be successful in this experience	4.29	0.92	2.00	5.00
I developed greater communication skills during this experience	4.4	0.872	3.00	5.00

^zSurvey responses listed in descending order of mean score.

^yScale used: 5=Strongly Agree, 4=Moderately Agree, 3=Agree, 2=Disagree, 1=Undecided, 0=Does Not Apply

Table 4. Student Responses Regarding the Value of Equine Extension Internships (n=5)^z

	Mean ^y	Standard Deviation	Minimum	Maximum
I have greater understanding of the leadership role of cooperative extension in providing education for youth and adults in the community	5.0	0.00	5.0	5.0
I developed an appreciation for how the state and county aspects of extension work together	5.0	0.00	5.0	5.0
I was responsible for planning extension programs/events	5.0	0.00	5.0	5.0
I helped conduct extension programs/events	5.0	0.00	5.0	5.0
I improved my communication skills during this experience	4.50	0.71	4.0	5.0
I assisted in the evaluation of extension programs/events	4.50	0.71	4.0	5.0

^zSurvey responses listed in descending order of mean score.

^yScale used: 5=Strongly Agree, 4=Moderately Agree, 3=Agree, 2=Disagree, 1=Undecided, 0=Does Not Apply

Table 5. Employer/Supervisor Responses Regarding Workplace Competencies of Student Interns (n=18)^z

	Mean ^y	Standard Deviation	Minimum	Maximum
Ability to follow instructions	4.89	0.32	4.0	5.0
Dependability	4.84	0.37	4.0	5.0
Willingness to learn	4.74	0.45	4.0	5.0
Efficiency	4.72	0.46	4.0	5.0
Completeness of work	4.72	0.46	4.0	5.0
Completed duties/tasks in a timely manner	4.72	0.46	4.0	5.0
Work ethic	4.68	0.48	4.0	5.0
Quality of work	4.67	0.48	4.0	5.0
Openness to try new things	4.67	0.48	4.0	5.0
Creativity	4.60	0.60	3.0	5.0
Innovation	4.44	0.73	3.0	5.0

^zSurvey responses listed in descending order of mean score.

^yScale used: 5=Strongly Agree, 4=Moderately Agree, 3=Agree, 2=Disagree, 1=Undecided, 0=Does Not Apply

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and Amstutz (2011) reported supervisors consistently rated student interns very highly in the areas of cooperation, supervisor acceptance, willingness to learn and acceptance by customers. Jogan and Hering (2007) indicated employers' ranked the most important qualities of potential employees as positive work ethic, honesty and selected hands-on skills. The excellent evaluation of interns in this study is similar to those of previous studies and indicates employers are very supportive of internship programs. Interns are an inexpensive means to train and evaluate potential future employees. They are affordable employees which are available seasonally and employers can encourage career minded, young professionals to enter a specific job market (Bennett-Wimbush and Amstutz, 2011). Callanan and Benzi (2004) assessed the completion of undergraduate internships and employment rates at graduation and found internships to be one of the most valuable experiences related to early career success. According to the National Association of Colleges and Universities (2014), the rate of full-time offers made to interns and co-op students has steadily increased with nearly 60% offers made in 2014. Furthermore, they reported former interns of an employer were more likely to remain with that company between 1 and 5 years.

Summary

The value of internships has been documented through numerous studies, yet, they appear to be even more important due to changing demographics and background of today's agricultural undergraduate students. Agricultural programs have an increasing number of non-rural students who desire careers in the equine industry. Additionally, employers have indicated a strong preference for students with "hands-on"/practical experience. Thus, students should be encouraged to participate in an internship to improve their marketability in the equine industry. This study further solidifies the benefits and needs for increased emphasis on students to participate in an internship experience.

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Flipping the College Classroom for Enhanced Student Learning¹

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Abstract

The “flipped” classroom has received a great deal of attention in recent years. The major idea behind the flipped classroom is to move lectures to outside of class time and move learning exercises and assessment into the classroom. Many teachers who have experienced this shift in instructional style have found that the flipped classroom is a change in mindset more than a change in methodology. The rapidly growing literature provides evidence that many teachers of flipped classrooms believed the experience to be exalting, with positive student learning and engagement outcomes. The primary goal in flipping the classroom for a first-year, introductory course in Principles of Agricultural Economics was to maximize student outcomes by better utilizing the face-to-face time with students. The design and implementation of the flipped classroom was a highly rewarding and educational experience for the instructor and resulted in higher levels of student learning and satisfaction. Flipped courses allow teachers to provide individualized attention to at-risk students and students who need motivation or academic skills.

Introduction

The flipped classroom refers to a model of teaching where the traditional lectures are viewed outside of class on a video. Class time is spent on inquiry-based learning: team-based assignments, quizzes and exams. The idea draws on concepts that include: (1) active learning, (2) student engagement, (3) hybrid course design and (4) course podcasting (Educause, 2012). The flipped model, popularized by Sal Khan of the Khan Academy, is getting a large amount of attention in recent years (Ani, 2012; The Economist, 2011; Gobry, 2012; and Talbert, 2012b). Tucker (2012) confirms that, “flipping is rapidly moving into the mainstream” (p. 83). Berrett (2012) reports that the increase in interest in flipping is driven by several trends, including technological innovation, an increase in the demand for accountability for measurable student learning outcomes and budget pressures that provide an incentive to make large traditional lectures more

productive. Some evidence suggests that the flipped classroom can result in improved student learning outcomes (Bergmann and Sams, 2012b; 2014; Strayer, 2012).

Bergmann et al., (2011) define the flipped classroom as: “(1) a means to increase the interaction and personalize contact time between students and teachers and (2) an environment where students take responsibility for their own learning.” Wilson (2013) flipped her undergraduate statistics course with two motivations. First, she desired to move the course closer to a “significant learning experience,” (p. 193) as defined by Fink (2013) and second, she desired to make changes that increased student interest, engagement and retention based on the ideas of how to teach “generation next,” as popularized by Taylor (2010, 2011).

Tucker (2012) emphasizes that there is no single model for flipping and the core idea is to flip the typical instructional approach: “*With teacher-created videos and interactive lessons, instruction that used to occur in class is now accessed at home, in advance of class. Class becomes the place to work through problems, advance concepts and engage in collaborative learning*” (Tucker, 2012, p. 82).

The major attribute of a flipped classroom is that the teacher can spend more individualized attention on each student and provide more interactive experiences for enrolled students. This often translates into better student-teacher rapport and relationships. When students are placed in teams, students teach each other, a powerful way of learning new material, since students can often explain the concepts to each other in a style more conducive to learning.

Wilson (2013) defines a flipped classroom as “...moving the typical ‘transmission of knowledge’ component of a class (i.e. lectures) to outside of the classroom and move the ‘application of knowledge’ (i.e. homework) into the classroom,” (p. 194) and goes on to argue that given the current state of information availability in the digital age, “...professors are no

¹This paper was developed from an invited presentation on the same topic at the teaching conference, Simple Strategies for Student Success. Kansas State University, Manhattan Kansas, February 1, 2013.

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longer the only (or even the best) source for [the type of information typically included in a traditional classroom lecture]. However, it can be argued that professors remain the best source for guiding students in how to understand and apply information, particularly newly acquired information” (Wilson, 2013, p. 194)

The primary goal in flipping the classroom in an introductory course in Principles of Agricultural Economics was to maximize student learning outcomes by better utilizing the face-to-face interactions during class time with students. The design and implementation of the flipped classroom was highly rewarding and educational for the instructor and as will be shown below, appears to have resulted in higher levels of student learning and satisfaction. Flipped courses have implications for retention, since pass rates are higher, engagement is greater and teachers can spend individualized attention on at-risk students and students who need motivation or academic skills (Bergmann and Sams, 2012b; 2014; Strayer, 2012).

Methods

Since 2012, the College of Agriculture at Kansas State University has experienced all-time record enrollments. Although impossible to know the exact cause, enrollment growth is likely due to the boom in the agricultural economy and the recession in the overall (nonagricultural) economy. As a result, courses are full with waiting lists. To deal with this issue, the Department of Agricultural Economics opened an “overload” course for AGEC 120, Principles of Agricultural Economics and Agribusiness for the Fall 2012 semester. The course was opened after the large lecture course was filled with 202 students. The overload course also quickly filled to a classroom capacity of 39 students. After hearing of “flipping” for the past several years, I decided to give it a try, after teaching this introductory course in the large lecture format for nearly 20 years. The motivation for the change followed Bergmann and Sams (2012a), who “... reasoned that the best use of class time centered on engaging students in enriching activities and hands-on experiences” (p. 25). This report summarizes the differences in course format and results between the large lecture course (nine courses during 2001-2008) and the flipped course format (one course in 2012). The courses were all taught by the same instructor. Courses taught by other instructors were not included, since they had not used the “flipped” course format. All courses were included that had both grades and student evaluations available.

The course characteristics for both the traditional lecture course and the flipped course appear in Table 1. One major difference between the two course formats was class size. The traditional class had 150-200 students per course and the flipped course had 39 students enrolled. The smaller course size allowed for the flipped course format to be successful. Wilson (2013) reflects that the flipped course format, “...might be more difficult to implement with a large class” (p. 198). It is

important to emphasize that many of the results of the flipped classroom reported here were due to the ability to teach a small class size, as discussed in Barkley (2001). In both traditional and flipped course formats, the content was identical and used the same textbook. The book was updated and revised over time, but the content was largely identical. The level of difficulty was identical. Table 1 summarizes the major differences between course formats. In the lecture course, lectures were conducted during class and covered the material in the book. In the flipped course, lectures were recorded and made available to students on the course homepage on the internet. Recording the videos was a useful exercise for the instructor. Tucker (2012) concluded that “...crafting a great four- to six-minute video lesson poses a tremendous instructional challenge: how to explain a concept in a clear, concise, bite-sized chunk” (p. 82). One major benefit to the instructor of flipping a course is to rethink course content by briefly summarizing lectures into videos.

Table 1. Characteristics of Lecture-Based and Flipped Course in AGEC 120

	Lecture-Based Course	Flipped Course
Enrollment	• 150-200 students	• 39 students
In Class	• Lecture on book	• Inquiry-based learning • Team essay assignments
Out of Class	• Read book • Weekly Assignments	• Videos • Read book
Assessment	• 4 Multiple-choice Exams	• Weekly Quizzes • Biweekly Oral Team Exams • Biweekly Essay Individual Exams

Perhaps the largest difference between course formats is the quantity and quality of assessment. In the traditional lecture course, assessment was confined to four multiple choice exams: three midterms and one comprehensive final exam. Students enrolled in the flipped classroom experienced frequent assessment and had an assignment due each day of class. On Mondays, a quiz was given based on the video lectures. Wednesdays were lab days, with teams of four students working in collaboration to complete a lab based on the lecture material. Similarly, Wilson (2013) assigned each student into a “learning group” for group homework assignments and in-class activities. She concluded, “Subjectively, I have witnessed much more interaction among students before and after the class since creating these learning groups” (p. 195). Teamwork skills are often requested by industry recruiters and are developed in the flipped classroom through small group assignments and examinations. Fridays were exam days, with an oral team exam given every other week and an individual essay exam on every other Friday. The essay exams covered two weeks of material, including what had been covered in the team oral exams in the week before.

At the beginning of the semester, students experienced a transitional period to get used to the frequency of the assessment and the demands of doing work every day. After a few weeks, students appeared pleased that the course requirements forced them to keep up, do the work and learn the material. The flipped

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format was also challenging for the instructor, as reported by Tucker (2012): "...there is no magic: course redesign is 'a hard job'" (p. 83). Horn (2013) summarized one of the major adjustments for the teacher: "*Classroom time is no longer spent taking in raw content, a largely passive process... The classroom becomes an interactive environment that engages students more directly in their education*" (p. 78).

Results and Discussion

To give up classroom lectures and have unique and high expectations for students was at first stressful for the instructor and the students. Berrett (2012) reports that a flipped class, "...demands that faculty members be good at answering students' questions on the spot, even when their misconceptions are not yet clear because they are still processing the information." However, the course soon became exhilarating: student learning was high and consistent! Attendance was nearly perfect throughout the entire semester and I learned a great deal about each student. Motivation was individualized, based on each student's personality, ability and academic maturity. Eric Mazur of Harvard University explains that, "*We put a lot of emphasis on the transfer of information. Simply transmitting information should not be the focus of teaching; helping students to assimilate that information should*" (quoted in Berrett, 2012).

Perhaps the most important result of the flipped class was the personalized instruction. I got to know every student and was able to identify and assist struggling students throughout the semester. Wilson (2013) provided statistical evidence that the student evaluations of her course and student performance increased dramatically when her course was "flipped." One reason is that "Students perceive the instructor as approachable and available to help them when needed" (Wilson, 2013, p. 197). The ability to provide personalized instruction is due in part to small class size, but also due to the ability to use class time for personal instruction, discussion and evaluation.

One unexpected result of the flipped course was that it addressed differences in student learning styles. Both videos and the book were available and covered the same material. When students were asked in both informal and formal polls, they were approximately evenly split between those who watched the videos and those who read the book. Of course, the best students did both and benefitted from two modes of learning. Providing both videos and books enhanced learning by targeting differences in learning style across students.

Robert Talbert (2012a) adopted the flipped approach in his math class and found that it was, "sort of magical." Talbert enthused: "*It gave them time, space and a social network in class to encounter difficult tasks and complete them. It freed up huge amounts of time outside of class to work... and I think that students get that it benefits them in these ways.*" The grades of the flipped course are compared to the traditional lecture course

Table 2. Summary of Flipped and Lecture Course Grades: AGEC 120, 2001-2012

Course Grade	Flipped		Lecture	
	Number	(percent)	Number	(percent)
A	14	(0.36)	244	(0.16)
B	21	(0.54)	433	(0.29)
C	4	(.10)	453	(0.30)
D	0	(0)	227	(0.15)
F	0	(0)	155	(0.10)
Incomplete	0	(0)	3	(0)

Notes: Lecture course taught 9 times: Fall 2006-2008; Spring 2001, 2003 -2007. Based on availability of grades and student evaluations.

Table 3. Summary of Flipped and Lecture Course Student Evaluations: AGEC 120, 2001-2012

Characteristic	Flipped	Lecture
	Fall 2012	2001-2008
Number of Students	39	150-200
Interested in Teaching	4.9	4.7
Well Prepared	4.9	4.7
Available for Help	4.9	4.7
Teacher Effectiveness	4.9	4.4
Amount Learned	4.8	4.2
Overall Course Rating	4.6	4.2
Percent Recommend Course to Others	100	93

Rating Scale: 5=Very High, 4=High, 3=Medium, 2=Low, 1=Very Low.

Notes: Lecture course taught 9 times: Fall 2006-2008; Spring 2001, 2003 -2007. Based on availability of grades and student evaluations.

in Table 2. Higher grades perhaps reflect more student involvement in the course, more personalized interaction with the instructor and more effort due to the frequency of assessment. Wilson (2013) concluded that "*Overall course grades were 9.99 points higher in the first two sections taught using the new method than in the two previous sections*" (p. 197) Since exams were taken by individual students, she concluded that, "*Improvement in exam scores thus reflects improvement in individual student knowledge*" (Wilson, 2013, p. 197).

This anecdotal case study is of one instructor's experience with a "flipped" course. In what follows, data from student evaluations are provided. It must be emphasized that these data are merely suggestive; no intent is made to provide statistical analysis. The numbers presented are descriptive only. Student reactions to the flipped format relative to the traditional course are reported in Table 3. The flipped course increased student evaluations. However, the lecture-based course evaluations are for nine courses, compared to only one flipped course. A more rigorous evaluation and comparison could be undertaken with more data. A flipped course requires that each student come to class prepared particularly in a team-based course. If a student has a poor performance on the Monday quiz, teammates know that the lab on Wednesday will not go as well. Collaborative assignments demonstrated that, in many cases, peers can motivate students better than teachers. If you have high expectations and standards, students will meet them... and even like them in some cases.

There are, however, potential challenges to the flipped teaching practice. Wilson (2013) reports that, "*Some students perceive the lack of lecture and the*

increased expectation for personal responsibility for one's own learning outside of class time as unfair or unreasonable" (p. 198). Berrett (2012) agrees: "Students cannot passively receive material in class, which is one reason some students dislike flipping." Horn (2013) also found that flipping "...doesn't tackle the root causes of the lack of motivation that persists among many low-achieving students." My experience was that a continuous flow of information about the motivation behind the new procedures worked well to reduce some early dissatisfaction with the course. A willingness to quickly and carefully respond to student questions and challenges seemed to help, together with flexibility to admit problems and correct issues when they arose. "The most effective flipped classroom practitioners are very thoughtful about their teaching practice... they're constantly modifying and tweaking their classes" (Bergmann and Sams, 2012a, p. 25).

Summary

The increased grade distribution provides the connection between the flipped course format and retention. If students were successful in their first semester, they are more likely to persist. Vincent Tinto, an expert in retention in higher education, stated, "It is evident that the first year, indeed the first semester, is critical to the student's eventual persistence until degree completion" (page 451, 1988).

The flipped classroom allowed for a close, supportive relationship between students and teachers. Tinto (1999) reports, "Students will get more involved in learning, spend more time learning and in turn learn more when they are placed in supportive educational settings that hold high expectations for their success, provide frequent feedback about their learning and require them to share learning with others" (p. 4). This quote captures the core characteristics of a flipped classroom.

A great deal of research suggests that the most important determinant of retention is student learning. According to Tinto, "Most importantly, students are more likely to persist and graduate in settings that foster learning. Learning has always been the key to student retention. Students who learn are students who stay" (page 3, 1999).

A first experience with a flipped classroom suggests that flipping could enhance learning and student engagement. The connection to retention is clear and direct, since the most important aspect of retention is... teaching and learning! The development and integration of new teaching methods into the classroom is beneficial. Successful adoption of new methods includes a great deal of thought, experimentation, trial and error, stress and failure. It is through this discovery process that progress is made and teaching and learning advance.

The design and implementation of the flipped classroom was a highly rewarding and educational experience for the instructor and resulted in higher levels of student learning and satisfaction. Flipped courses have implications for retention, since pass rates are

higher, engagement is greater and teachers can spend individualized attention on at-risk students and students who need motivation or academic skills.

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A Model to Augment Critical Thinking and Create Knowledge through Writing in the Agricultural Social Sciences

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Abstract

Effective writing instruction is essential to the development of a competent and diverse 21st century workforce in the agricultural social sciences. Writing instruction can be illustrated using a model framework that describes its relationships, elements and characteristics. Therefore, the purpose of this study was to use a mixed-method research design to develop a model to augment critical thinking and create knowledge through writing in the agricultural social sciences. Writing instruction in the agricultural social sciences is effective if the writing process is supported by students' confidence, cognitive processes and content knowledge, which are influenced by students' discourse knowledge and social context. The illustrative model is a model of reality because it is a graphical representation of physical relationships between concepts. It presents writing in the agricultural social sciences as a complex integrated system—each element has a relationship with other elements within the system—that requires the layered writing process to be embedded in context-specific knowledge domains, cognitive processes and societal influences. This model has the potential to guide practice and provide a foundation for scientific discovery, but more research is needed to understand the interactivity, interdependence and interrelationships among its elements.

Introduction

The writing research base has grown and become diversified since its seedling stage in the late 1960s (Alamargot and Chanquoy, 2001; Nystrand, 2006). However, heterogeneity of writing models is a problem even though diversified writing models provide the profession with the opportunity to progress toward the development of writing theory (Alamargot and Chanquoy, 2001). Writing models and theories started as general and descriptive. Yet, they have become more functional by defining and describing specific sub processes

of writing and their relationships to the more complex process of writing (Alamargot and Chanquoy, 2001). Models provide writing researchers with an analytical definition of writing and the writing process and help them focus on specific elements of writing while visualizing the larger complex system (Alamargot and Chanquoy, 2001). Models, grounded in research, are still needed by not only researchers to further the research base of writing but also practitioners who rely on researchers to discover new ways to teach writing (Pritchard and Honeycutt, 2006) in a variety of disciplines.

Teaching writing in agriculture is important (Jackson, 1972) because it helps students think critically, gather and comprehend information and gain content knowledge (Cobia, 1986). When integrated into the course content, writing becomes an outlet for students to learn content-related material (Aaron, 1996) and a form of knowledge assessment (Ryan and Campa, 2000). Nilsson and Fulton (2002) stated that writing assignments were the most used form of evaluation in agriculture capstone courses and the most important outcome measure was communication skills. Instruction related to the development of scientific and technical writing skills within the disciplines is needed because too many courses include writing as a component and not as a way to develop content knowledge (Howard et al., 2006). Using writing as a way to learn helps students engage in course material, breakdown complex ideas and constructs (Ryan and Campa, 2000) and increase their intellectual capacity, helping them transition from college students to employees more efficiently (Epstein, 1999).

Effective writing instruction is essential to the development of a competent and diverse 21st century workforce in the agricultural social sciences (Aaron, 1996; Cobia, 1986; Coorts, 1987; Jackson, 1972; Walker, 2011). Because employers, alumni, faculty and students

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ranked communication as a preferred soft skill (Crawford et al., 2011), improving students' ability to communicate is among the top seven needs of curriculum in agriculture (Coorts, 1987). Employers seek employees who have technical agriculture knowledge and the ability to creatively and effectively disseminate information; therefore, students need skills in technical agriculture, communications, data collection and time management (Walker, 2011).

Writing instruction in the agricultural social sciences can be illustrated using a model framework, described by Hayes (2006) and Phillips (1996) as a framework that contains the ideas, relationships and elements researchers believe guide a specific area of inquiry. Kitchel and Ball (2014) said that conceptual models are used in agricultural education as "visual diagram[s] or description[s] indicating relationships between or among variables" (p. 190) because models describe phenomena but do not predict it (Shoemaker et al., 2004). Scientists can develop theoretical frameworks, structure hypothesis, select variables, choose research designs and develop instruments using an underlying model (Phillips, 1996), which can be categorized as "models 'of reality' or 'models 'for' reality'" (Geertz, 1973, p. 93). A model of reality is a "what is" or conceptual model — a graphical representation of physical relationships between concepts (Geertz, 1973). Whereas, a model for reality is a "how-to" or procedural model—a description of a process or task and how to complete the task (Geertz, 1973).

Models should present a subject in a way that it has never been presented before by opening a door to new light (Hayes and Flower, 1980b). "*As a profession grows...—value assumptions are redefined, knowledge is extended and skill is perfected—but it is the acquisition of knowledge and the organizing of it into meaningful patterns[,] which enriches professional practice*" (McKay, 1969, p. 393). Models are the foundation of research and should be constantly investigated (Phillips, 1996) because research guides practice and the adaption and modification of the original model framework (Hayes, 2006; Phillips, 1996).

Like many professions, a model of writing grounded in research is needed in the agricultural social sciences because writing programs are discipline, institution and industry specific and one model of writing cannot function in all settings (Fulwiler and Young, 1990). Therefore, the purpose of this study was to use a mixed-method research design to develop a model to augment critical thinking and create knowledge through writing in the social sciences of agriculture. One research question and two objectives guided this study:

1. What writing elements contribute to a model of writing in the agricultural social sciences?
 - 1.1. Synthesize data previously collected using a review of literature, stakeholder interviews and a Q sort.
 - 1.2. Develop a model of writing that augments critical thinking and creates knowledge.

Method

The method used in this study was part of the reporting for a larger dissertation research project, A model to augment critical thinking and create knowledge through writing in the social sciences of agriculture (Leggette, 2013). The Texas A&M University Institutional Review Board approved the study protocol and all participants provided informed consent prior to participating in the study.

A model to augment critical thinking and create knowledge through writing in the agricultural social sciences grew out of the idea that certain writing elements augment students' ability to become critical thinkers and knowledge creators. The model "of" reality (Geertz, 1973) was developed using a mixed-method research design because multiple paradigms of research methods are important in understanding social complexities (Greene and Caracelli, 1997). Methods are "carriers of different paradigm elements that—when combined—enable us to see our data in enriched and new ways" (Riggin, 1997, p. 87). In mixed-method component designs, methods are combined at interpretation and conclusion with three specific designs: triangulation, complementarily and expansion. This mixed-method study was designed to establish triangulation using a combination of inquiry paradigms, which serves as a way to "minimize study biases that derive from inherent design weaknesses" (Caracelli and Greene, 1997, p. 23).

Model development began with problem identification, which was followed by using consistent stories from contextual experts as the basis for model development (Ford and Sterman, 1998; Morecroft, 1985; Morecroft and van der Heijden, 1992). The model of writing in the agricultural social sciences provides a framework for effective writing instruction that augments critical thinking and creates knowledge. The mixed-method study was completed in three phases and the data were collected between February 2012 and April 2013. Each phase was analyzed independently and built on the prior collected data. In addition, the data collected during phase one and two were reviewed, analyzed and reported as one study that guided the model development in phase three. The phase two findings that contributed to the model are reported by phase and not by individual participant.

The first phase of the study was a qualitative review and evaluation of writing theories and conceptual models using the pragmatic and methodical theory evaluation criteria proposed by Dudley-Brown in 1997. The Google Scholar, Texas A&M University library and WorldCat.org search revealed three theories and seven conceptual models. Additionally, a qualitative coding (Saldaña, 2013) template as well as personal experiences teaching and researching writing were used to document the description, inclusion and exclusion evaluation criteria and typical exemplars for each of Dudley-Brown's (1997) criterion.

The second phase of the study included semi-structured interviews, focus groups and Q-sorts with

teams of experts who had a wide range of expertise, providing researchers with varying perspectives to guide the model development process (Morecroft, 1985; Morecroft and van der Heijden, 1992). Developing models is the pooling of knowledge into a framework that can be applied to a scenario and used to interpret real events (Morecroft and van der Heijden, 1992). To develop conceptual models, a researcher must use “elicitation, articulation and description of knowledge ... [of] system experts” (Ford and Sterman, 1998, p. 310).

Eight semi-structured interviews (Lindolf and Taylor, 2011) with faculty who taught a writing-intensive course during fall 2011 or spring 2012 were used to define the role of writing in the agricultural social sciences (noted as Phase 2.1 in the results). Faculty were identified using a simple random sample (Wiersma and Jurs, 2005) of the purposive sample. Interview questions were developed based on the concerns of writing instructors and researchers, a review of literature and the theoretical paradigms and conceptual models of writing identified in phase one of the study.

Student focus groups (Krueger and Casey, 2000) were conducted to understand students’ experiences in and attitudes about writing-intensive courses in the agricultural social sciences (noted as Phase 2.2 in the results). Students were identified using a purposive sample. Fifteen students participated in three focus groups. Focus group questions were developed based on phase one of the study and the interviews with faculty. The questions were modified after each focus group if needed.

Q sorts were conducted with faculty, students and current and former administrators in the College of Agriculture and Life Sciences (noted as Phase 2.3 in the results). Q methodology bridges the gap between the qualitative and quantitative research paradigms to measure subjectivity (Tuler et al., 2005). Three faculty members, four students and three administrators sorted 37 specific statements related to writing factors that augment critical thinking and create knowledge in the agricultural social sciences. Data collected from phase one of the study, the interviews and the focus groups were used to develop the Q-sort statements.

The conceptual model was developed during phase three of the study. After conducting phases one and two, key components of and factors related to writing were documented to facilitate the model development. Each phase of data collection was revisited to determine what elements and concepts should be included in the model. Each Q-sort statement was not incorporated into the writing model because

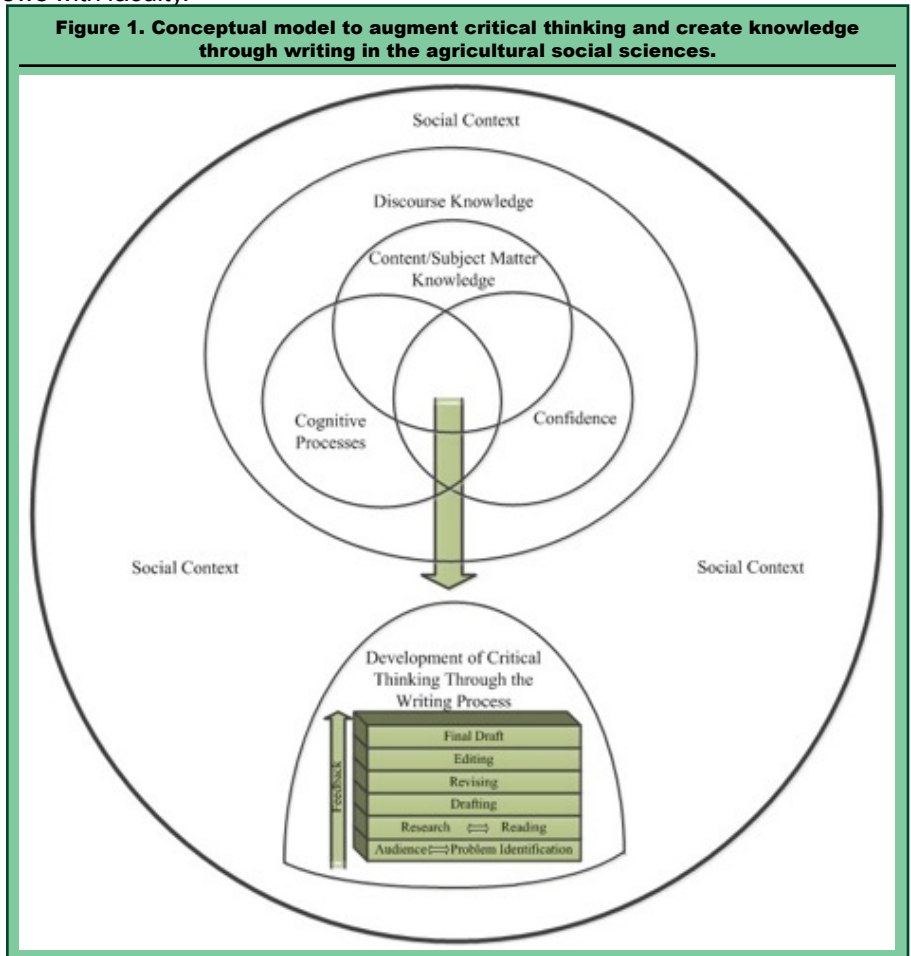
of conflicting research. Additionally, common statements and themes were condensed and restructured for the best possible presentation. A diagram was constructed based on the field work and the interviews “to illustrate the connections ... and to interpret the system’s likely behavior” (Morecroft, 1985, p. 14). The condensed statements and themes were placed into a graphical representation, as suggested by Morecroft (1985), to portray the writing elements that augment critical thinking and create knowledge in the agricultural social sciences.

Results and Discussion

Writing is often shaped and carried out in a complex environment guided by the attitudes and feelings of not only the writer but also the society and people who surround him or her (Flower, 1994). In 2009, the National Council of Teachers of English stated that a new model of writing needed to include social awareness and audience because “neither social nor cognitive theory makes genuine sense without the other” (Flower, 1994, p. 33). The conceptual model to augment critical thinking and create knowledge through writing in the agricultural social sciences (see Figure 1) introduced here postulates that students in the agricultural social sciences develop critical thinking skills and learn through writing if certain elements are present.

This writing model has two characteristics that set it apart from other models: the encompassing influence

Figure 1. Conceptual model to augment critical thinking and create knowledge through writing in the agricultural social sciences.



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of the agricultural social context and the depiction of the writing process as a layered process that occurs as a result of students' ability to think critically while developing a product using a research-based foundation. The writing process depicted as the center of the model draws on the layering concept because focus group participants (Phase 2.2) claimed "writing is a layering process" that requires students to develop and build on information as part of constructing text. The writing process is only as strong as students' social context and their ability to lay an empirically sound foundation that supports the process.

The first layer is audience and problem identification (National Council of Teachers of English, 2009). The interpretation principle of critical thinking is developed in the first layer of the writing process because students must interpret and understand the problem while they are identifying their target audience. Focus group participants (Phase 2.2) emphasized that students must "understand the topic from all points of view and see the topic through the eyes of their readers" before moving onto the second layer of the process. Target audiences within the agricultural social sciences include agricultural researchers, practitioners and consumers. Therefore, students must be prepared to interpret the needs of diverse audiences, which forces students to "understand a side they have never experienced" (Phase 2.2). Although sometimes students may interpret the audience before interpreting the problem, the two are situated at the base of the layering process because an effective writer interprets the target audience and the problem using empirically sound evidence (Phase 2.2).

The second layer is conducting research related to the audience and problem identified as part of the first layer in the writing process. Students develop the ability to analyze information and enhance their critical thinking skills while analyzing the facts and information they found by researching the problem (Phase 2.3). To create and transform new knowledge, students must spend time researching and reading (Phases 2.1, 2.2; Bereiter and Scardamalia, 1987; Ryan and Campa, 2000). Writing is understanding how concepts are connected and explaining that connection to an audience identified in the first layer of the writing process (Orr, 1996). Agricultural social science students serve as the dissemination channel between the industry and the public (Phase 2.1). Therefore, they should gather information from a variety of sources and disseminate the information to larger populations (Walker, 2011). During the research layer, students begin to understand the intricate pieces of the topic and how those pieces become parts of a larger whole. Students should use the knowledge they have about the audience and problem and combine it with the knowledge they gained during the research process to transform knowledge in the draft product (Bereiter and Scardamalia, 1987; Ryan and Campa, 2000).

The third layer is drafting (National Council of Teachers in English, 2009). Drafting includes producing mul-

iple drafts to gain practice writing, to develop skills in condensing and refining information for a specific audience and to enhance critical thinking skills by making inferences and explaining facts based on research (Phases 2.2, 2.3). Alamargot and Chanquoy (2001) postulated that delimiting and adapting text and developing and presenting ideas in text are important parts of the writing process. However, surface-level writers typically produce one draft and do not spend substantial time in the preparing, thinking and revising stages of the writing process (Lingwall and Kuehn, 2013). To become deep writers who engage in reflection and revision, students must spend time moving between the third and fourth layer of the writing process (Phase 2.1)

The fourth layer is revising, which is a layer that beginning writers often fail to work through because they do not know how to properly revise text (Epstein, 1999; Maimon et al., 2007; Vilardi, 1986). Revising, however, is instrumental in students' ability to evaluate meaning of the text they produce (Phases 2.1, 2.2). As students evaluate meaning, they enhance their critical thinking and reasoning skills. Extensive revising, however, is a characteristic of knowledge crafters, which is the expertise level of writing and often takes 20 years of maturation, instruction and training to achieve (Kellogg, 2008). Therefore, students in the agricultural social sciences should have "instruction and training in revising multiple times during the process to better develop and present text" (Phases 2.1, 2.2, 2.3). Because revision is more than cosmetics, students should attend to the reader's perspective; review the paper and its parts; and add, delete and move text as needed during the revision process (Epstein, 1999; Maimon et al., 2007; Vilardi, 1986).

The fifth layer of the writing process is editing. The editing process is tedious because writers must polish the product (e.g., shorten sentences, delete empty words, delete extraneous material) and make final changes before publication (Maimon et al., 2007; Vilardi, 1986). As students in the agricultural social sciences edit their product, they are enhancing their critical thinking skills by evaluating their work using grammar and mechanics rules. However, focus group participants (Phase 2.2) said that many students in the agricultural social sciences are "not fluent in basic grammar and mechanics" and too often instructors spend class time "teaching the basics of writing." If the content is not presented using proper grammar and mechanics, "the written word is not effective" even though the product contains factual information (Phase 2.1). Therefore, effective writers have writing process knowledge, industry and discipline knowledge and writing conventions and editing knowledge (Beaufort, 1999).

The sixth and final layer of the writing process is the final draft. Although writing is a continual process and a product can always be refined (Phases 2.1, 2.2), the final draft should be complete, present a well-developed message to its audience and meet the content, mechanics and style requirements set forth

by the defined audience. After students submit the final product, they should engage in self-regulation by spending time reflecting on the writing process. Deep writers spend time reflecting and identifying ways to enhance their writing in the future (Lingwall and Kuehn, 2013).

An important piece of the model is the rich, timely feedback that guides the writing process (Phases 2.1, 2.2, 2.3; Hayes and Devitt, 2008; National Council of Teachers in English, 2009). Roberts-Nkrumah (2005) found that “writing is thinking and that it is a process” (p.22) that must be completed in the presence of feedback. Dunsford (2006) explained that students made more revisions if they received oral feedback than if they received written feedback.

Formal feedback has three sources: instructor, peer and self (Phases 2.1, 2.2, 2.3). Instructor feedback should be provided at each stage of the writing process. Students become effective writers by being guided through the process (Phases 2.1, 2.2) not “by continuously writing and making the same mistakes” (Phase 2.3). For example, students should complete small assignments in class that lead to larger more, in-depth writing assignments because instructors can provide incremental feedback at each layer of the writing process (Phase 2.1). “Teacher comment influences student revision choices[,] and the more directive the teacher comment, the better chance the students will revise their texts successfully” (Dunsford, 2006, p. 17). In contrast, peer feedback does not increase students’ ability to think critically and create knowledge because “poor writers do not help poor writers become more effective writers” (Phase 2.3). To become effective writers, students must be “guided by writers who can write themselves” (Phase 2.3). In addition, students should become critical assessors of their own writing to provide them with a deeper learning experience (Leggette et al., 2013)

Students in the agricultural social sciences demonstrate critical thinking through the writing process because they must work through the process to solve a problem and deliver the solution in written form (Phase 2.3). The objective of critical thinking is “to assess the truth of statements, the validity of an argument, or the soundness of a proposal and come to a judgment” (Henderson, 1972, p. 46). Critical thinking is demonstrated during the writing process at varying levels because students have the opportunity to interpret, analyze, infer, explain, evaluate and self-regulate, which Stedman (2015) noted as instrumental in the critical thinking process. Critical thinking skills can be improved through writing assignments that promote the use of students’ logical thought processes and problem solving skills (Hayes and Devitt, 2008; Schmidt et al., 2002; Strachan, 2008; Tapper, 2004). Tapper (2004) believed that clear thinking often leads to clear writing. For students to identify an audience, identify a problem, conduct research, produce multiple drafts, revise thoroughly and critically, edit for writing mechanics and produce a final draft, they

must be able to think critically, apply old knowledge to new situations and transform new knowledge (Phases 2.1, 2.2).

The three elements that surround the writing process embedded in critical thinking are content knowledge (Phase 2.2; Beaufort, 1999), cognitive processes (Deane et al., 2008; Hayes, 1996; Hayes and Flower, 1980a; Kellogg, 1996) and confidence (Phase 2.1). Content knowledge is important in understanding and communicating about the topic. Employers seek employees who not only have technical agriculture knowledge but also have the ability to creatively and effectively communicate agriculture information using simple language (Walker, 2011). Before communicating about a problem, students must identify and research the problem during the first and second layer of the writing process (Phases 2.2, 2.3). Without understanding the topic, students in the agricultural social sciences cannot disseminate technical agricultural information to a larger, more specific audience (Phase 2.2).

Cognitive processes, as defined by Deane et al. (2008), are domain knowledge, working memory, informal/verbal reasoning, linguistic skills and social evaluative skills. Domain knowledge provides support in the “planning stage (when the writer must decide how to structure the text) and in reading (when the reviewers or the reader must decide how the material is in fact organized)” (Deane et al., 2008, p. 19). Domain knowledge can increase writing quality because the writer’s familiarity with the topic of the story connects with the working memory and together they are a key component of the writing process (Deane et al., 2008). “Writing performance depends critically upon being able to recall relevant knowledge and manipulate it in working memory” (Deane et al., 2008, p. 20). Prior knowledge relevant to the topic as well as working memory affect the quality of students’ writing (Deane et al., 2008) because writing is more than putting words on paper. It is “setting goals, formulating problems, evaluating decisions and planning in the light of prior goals and decisions” (Bereiter and Scardamalia, 1987, p. 363). Writing, therefore, is instrumental in students’ decision making abilities and their capacity to solve problems (Phase 2.3).

Furthermore, students’ confidence is an important part in students’ ability to write and think critically (Phase 2.1). Students’ competence is guided by their confidence in their abilities to perform complex writing tasks. Bereiter and Scardamalia (1987) recommended that instructors “involve students in investigations of their own strategies and knowledge because ... students should see it as their responsibility to help each other develop their knowledge” (p. 363). Part of developing is struggling to transform knowledge and gaining experience by working through problems associated with writing (Phase 2.1; Bereiter and Scardamalia, 1987). Often times, students lack confidence in their ability to write and in their position as an expert on a given topic (Phase 2.1). For students to become effective writers, they must

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develop confidence in themselves and competence in their abilities (Phase 2.1).

Content knowledge (Phase 2.2; Beaufort, 1999), cognitive processes (Deane et al., 2008; Hayes, 1996; Hayes and Flower, 1980a; Kellogg, 1996) and confidence (Phase 2.1) are situated within discourse knowledge. The discourse community defines the types of writings that occur within the boundaries of the environment (Beaufort, 1999). It is a common misconception that writing is a general skill that can be used across disciplines and professions without some level of adaptation and modification (Beaufort, 1999). However, "discourse communities exhibit a particular network of communicative channels, oral and written, whose interplay affects the purposes and meanings of the written texts produced within the community" (Beaufort, 1999, pp. 18–19). A discourse community could be different for two writing tasks in the same discipline because the discourse community is defined by the audience (Beaufort, 1999), which is why it is important that students clearly and correctly identify their audience at the beginning of the writing process (Phase 2.2). A mistake at the beginning of the process could have negative impacts throughout the duration of the assignment. Therefore, students in the agricultural social sciences should understand how to communicate within their content area as well as how to communicate within the larger agricultural industry (Phase 2.1).

The elements within the conceptual model to augment critical thinking and create knowledge through writing in the social sciences of agriculture are intertwined and linked together by the social context of the writing environment (Phase 2.3). Writers internally and externally negotiate meaning. In the presence of negotiated meaning, individuals are freethinkers ready to share a unique understanding and conceptualization of information (Flower, 1994). Social context is a key in the development of writing proficiency (Phase 2.3; Deane et al., 2008). Socio-culture stresses that "community practices deeply influence what sort of writing tasks will be undertaken, how they will be structured and how they will be received" (Deane et al., 2008, p. 13). Therefore, the elements of writing in this model are joined together in an overarching social context because of its impact on students' development, presentation and understanding of text.

The illustrative conceptual model to augment critical thinking and create knowledge through writing in the agricultural social sciences is a model "of" reality (Geertz, 1973) because it is a graphical representation of physical relationships between concepts. It presents writing as a "complex integrated system" (Phase 2.3) that requires the layered writing process, which is built on a strong foundation of knowing and understanding the audience and topic, to be embedded in context-specific knowledge domains (Beaufort, 1999), cognitive processes (Deane et al., 2008; Hayes, 1996; Hayes and Flower, 1980a; Kellogg, 1996) and societal influences (Flower, 1994). The writing process is not independent of the system (Phase 2.2). The writing process must

be carried out within the complex system if students in the agricultural social sciences are to become effective writers, critical thinkers and knowledge creators.

Because text is developed during the writing process, the layered elements are the core of the complex system. Each layer of the writing process is present in all contexts, but the extent that the layer is present depends on the student's ability to think critically and on the context, situation and audience. Writing assignments, without regard to the level of complexity, could not be completed if the structured layering process was not part of the system. Therefore, the usefulness of the model is dependent on the presence and strength of the writing process. Additionally, although the writing process is the core of the complex system, it cannot stand alone. For students to reach a deep, elaborative level of writing, their writing process must be interactive with, be interdependent on and have an interrelationship with their confidence, cognitive processes, content knowledge, discourse knowledge and social context.

Each element contributes to the writing process and critical thinking, demonstrated through the layers of the writing process, and is co-dependent on the other elements. The importance of each element, however, is defined by the context, situation and audience of the writing assignment. As students move through the writing process, they draw from their cognitive processes, confidence levels, content knowledge, discourse knowledge and societal influences. Students may draw from the elements simultaneously or not at all during each layer of the writing process. If each element of the model is not present, however, the text that students produce may not be deep, elaborative level writing.

More research (e.g., structural equation modeling and/or discriminate function analysis), however, is necessary to understand the interactivity, interdependence and interrelationship among the model's elements. The areas of overlap within the model need to be investigated to determine their impact on the writing system. Moreover, more research should be conducted on how and to what extent each element impacts the writing process. The writing process layers are universal and widely applied but their importance in the process and impact on the system may be dependent on the context, situation and audience. Therefore, more research should be conducted to investigate how context, situation and audience impact the writing process layers and define the elements' degree of function within the model.

Summary

Writing has become an age-old communication medium that many scholars have investigated. However, writing is such a broad line of inquiry that researchers are still years away from understanding writing and knowing how to facilitate writing instruction, especially in the context of agriculture. Some would argue that writing is more about content development while others would argue that writing is more about grammar and mechanics. Yet, writing is not about content development or about

grammar and mechanics. Writing is a way for students in the agricultural social sciences to think critically, create knowledge and connect concepts.

Writing instruction is an important component of a higher education in agricultural sciences and natural resources. The agricultural industry is comprised of multiple disciplines and discourse communities and each one has a set of beliefs, values and opinions. Often times, students learn how to write for one discourse community instead of learning how to transfer their writing skills from one discourse community and writing task to another discourse community and writing task. Because writing is a way for students to become critical thinkers and knowledge creators, writing instruction should be intentionally implemented according to a conceptual model and should not occur haphazardly. Using this conceptual model as a basis for course modification will help students write to learn and understand across multiple disciplines and discourse communities and not just write to write.

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In-Class Experiment Assesses Empathy for International Hunger and Poverty

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Abstract

Most of the world's poor work in agriculture. In addition, food expenditures comprise a substantial portion of the budget of those living in extreme poverty. As the future leaders in the agricultural industry, it is critical for students to appreciate the challenges of hunger and poverty internationally. We describe the use of an in-class experiment where students were randomly selected to receive different survey instruments with different background information that elicit their willingness to give to reduce international hunger and poverty. The first survey provided a picture of a young girl and her story about struggling with hunger and poverty. The second survey provided statistics on hunger and poverty, and the third survey provided no background information. Results were reported to the class indicating that students presented with an identifiable victim were more willing to give, providing the students an opportunity to reflect on their own response and how they may have responded in the alternative scenario. We found that 85% of the students agreed that the experiment helped them better understand what motivates people to participate in reducing international hunger and poverty.

Introduction

Agriculture plays a critical role in improving the livelihoods of a large portion of the world's population that faces the challenges of hunger and poverty. The latest report by the FAO (2013) indicates that 868 million people (roughly 12% of global population) suffer from undernourishment, with continued micronutrient deficiencies affecting around 2 billion people (roughly 29% of global population). Childhood malnutrition remains the cause of death for more than 2.5 million children every year and more than 100 million children under the age of five are underweight. Agriculture plays a critical role not only because increasing production reduces the price of food for the urban poor who spend a majority of their income on food, but also for the rural poor whose primary source of employment is agriculture.

In fact, agriculture is the primary source of employment in the economies of many low-income countries and research shows that agricultural productivity growth results in substantial reductions in poverty. For example, Christiaensen et al. (2011) estimate that GDP (Gross Domestic Product) growth in agriculture results in greater reductions in poverty than an equal amount of GDP growth in other sectors of the economy. The Green Revolution is also often cited as an important driver of historical poverty reduction (Hazell and Ramasamy, 1991). Given the role of agriculture in the reduction of hunger and poverty, it is important for students in agriculture to appreciate the role they play in global food security.

Several previous studies have revealed a need to increase the exposure of students in agriculture to a global perspective (Brooks et al, 2006; Colyer, 1993; Henson and Noel, 1989; King and Martin, 1994; Mason et al., 1994; Place et al., 2004). The NACTA Journal devoted an entire special issue in September 2013 (volume 57, no. 3a) to the topic of globalization and the implications for teaching and learning. Most previous studies motivate the internalization of curricula on the basis that undergraduate careers are increasingly connected to global markets, and rightly so. Our emphasis is to help students recognize the potential role that they have in improving the livelihoods of the global poor. Many papers in the special issue of the NACTA Journal discuss the creation of effective study abroad programs (e.g., Barkley and Barkley, 2013; Sherk, 2013), but others discuss incorporating international issues into course content (e.g., Higgins, et al., 2013; Morgan and King, 2013). In this paper, we describe an in-class experiment designed to help give students a global perspective on hunger and poverty.

One prerequisite to students recognizing their potential in reducing global hunger and poverty is for them to empathize with the condition of the global poor. Some current research suggests a void in U.S. college

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students' ability to express empathy, which refers to the "tendency to react to other people's observed experiences" (Konrath et al. 2011, p. 2). These authors examined empathy changes from 1979 to 2009 in undergraduate college students at conventional 4-year institutions in the United States. They found a significant decline in empathy after 2000. Some speculate that this reduction in empathy towards others is attributed to the environmental upbringing of a generation of students whom some consider the most self-concerned, competitive, confident, and individualistic cohort in recent history (Konrath et al., 2011; Twenge, 2006; Twenge et al, 2008; Mallan, 2009). Personal experience teaching undergraduates about global poverty also revealed a lack of empathy, where some students—though certainly not all—suggest the topic is not relevant to their lives.

We constructed an in-class experiment designed to assess and develop empathy in college students toward issues in international hunger and poverty and analyzed the effectiveness of the experiment. Replications of this experiment in agricultural classrooms – or in any course incorporating international poverty issues – can serve as a valuable instructional tool allowing students to become more self-aware of the factors that contribute to their empathy towards others affected by hunger and poverty.

Methods

The experiment was conducted in a course with 124 enrolled students at Kansas State University. The course is titled "Contemporary Issues in Global Food and Agricultural Systems" and is mostly comprised of students in the College of Agriculture. The course is required of all students majoring in Agribusiness or Agricultural Economics but several non-majors were also enrolled. A wide range of topics are covered in the course from global supply and demand for food, environmental and natural resources, international trade, and international development.

Prior to the section of the course on international development, students were informed that they could receive extra credit for completing an online survey. The experiment consisted of three separate surveys similar in design to those of Small et al. (2007) and made available to students online via Qualtrics software. The students were divided among the three survey instruments based on the first letter of their last name. Students were informed that their responses were anonymous, but that aggregate results would be reported in class. Although students received extra credit for completing the survey, their names could not be linked to particular survey responses.

The first page of all three surveys involved a series of demographic questions (surveys are available from the authors upon request). The second page of questions presented a hypothetical scenario aimed at revealing students' empathy toward international poverty and hunger. We proxy the empathy of students by their willingness to donate time or money or support policies that fund international agricultural development.

For example, Barraza and Zak (2009) found a strong correlation between empathy, generosity to strangers and donations to charity. Future versions of the experiment could include an empathy scale component such as that used by Davis (1983) as an alternative measure of empathy. On the second page of questions, students were given different information depending on which survey they received as discussed below. The third page of questions included open-ended questions to assess their motivations and current generosity toward reducing international hunger and poverty.

The survey design in our experiment was inspired by Small et al. (2007)—though they did not conduct their experiments in a classroom setting for educational purposes. Students in the first survey group, referred to as the "Rokia group", were presented with an identifiable victim, Rokia, a 7 year old girl from Mali, Africa. The students were informed that "Rokia is desperately poor, and faces a threat of severe hunger or even starvation. Her life will be changed for the better as a result of your financial gift." A fictional picture of Rokia was also included. The language used to describe Rokia was taken directly from Small et al. (2007). Following the information about Rokia, students were asked the following three questions:

1. How much money would you be willing to donate today? Any money that you donate will go to Rokia.
2. How much time would you be willing to donate to a food drive that would directly benefit Rokia and her community?
3. Would you support a U.S. policy that invests in agricultural research in Sub-Saharan Africa to increase agricultural production and reduce hunger? The policy would cost the average taxpayer \$5.

For the first question, students could select \$0, \$1, \$2, \$3, \$4, or \$5. For the second question, students could select 0, 0.5, 1, 2, or 3 hours. For the third question, students could select yes or no.

The second group, referred to as the "statistical group," was provided with a statistical description of numerous hunger and poverty issues in Sub-Saharan Africa with no mention of the girl Rokia. Students were then asked the following questions:

1. How much money would you be willing to donate today to help reduce hunger in Sub-Saharan Africa?
2. How much time would you be willing to donate to a food drive that would directly benefit communities in Sub-Saharan Africa?
3. Would you support a U.S. policy that invests in agricultural research in Sub-Saharan Africa to increase agricultural production and reduce hunger? The policy would cost the average taxpayer \$5.

The key difference in the wording of the donation questions for the statistical survey group was that the

donations would benefit Sub-Saharan Africa in general, rather than directly benefitting Rokia and her community.

The final group, referred to as the “control group,” was given questions identical to those posed to the statistical group; however, it was not paired with any accompanying information about poverty or hunger.

Preceding this line of questioning was an explicit “Cheap Talk Script” indicating that people tend to overstate their generosity when posed with a hypothetical situation versus an actual donation request.

The Cheap Talk Script

We are now going to ask how much you would donate in a hypothetical scenario. The experience from previous surveys is that people often state a higher willingness to donate than what one is actually willing to donate to this cause. Accordingly, it is important that you make each of your upcoming selections like you would if you were actually facing these exact choices in real life, i.e., noting that a donation means that you would have less money available for other purchases.

Cheap talk scripts were originally proposed by Cummings and Taylor (1999) to reduce the hypothetical bias of people who indicate a larger value for a good when presented with a hypothetical scenario than when they actually have to pay for the good. Tonsor and Shupp (2011) find a similar cheap talk script to be effective in an online experiment.

After the students completed the survey, the results were analyzed using Ordinary Least Squares (OLS) regression. We estimated three separate regressions where we model the following responses as different dependent variables in each regression: (i) amount of money willing to donate, (ii) amount of time willing to donate, and (iii) a binary variable equal to 1 if the student would vote yes for the policy and 0 otherwise. The regressions each take the form

$$y_i = \beta_0 + \beta_1 Rokia_i + \beta_2 Stats_i + \beta_3 Female_i + \beta_4 Rural_i + \beta_5 Travel_i + \epsilon_i,$$

where y_i denotes the response of student i , $Rokia_i$ equals 1 if the student was in the Rokia group and 0 otherwise, $Stats_i$ equals 1 if the student was in the statistical group, $Female_i$ equals 1 if the student was a female, $Rural_i$ equals 1 if the student was from a rural background, and $Travel_i$ equals 1 if the student had experienced some international travel for non-vacation purposes.

The purpose of the regressions was to statistically test if students responded differently depending on which survey they received. For example, the β_1 coefficient represents the average additional willingness to give (or the additional probability of voting yes) of students in the Rokia group compared to students in the control group. The regression is also useful as a way of summarizing how willingness to give is associated with different demographic characteristics. It is not necessary to include the demographic control variables in the regression to obtain a causal estimate of the effect of

the different survey instruments since the students were randomly assigned to the survey groups. Including the demographic control variables did, however, improve efficiency and provided interesting results to see how these characteristics are correlated with willingness to give.

A 50 minute course period was used to present the results to the students after they had all completed the survey. Students were informed at this time that three different surveys had been distributed and the different surveys were shown to the students. At this point, students were smiling recognizing exactly how the results were likely to differ and were engaged in the exercise. The difference in responses between the survey groups were displayed graphically and regression results were also displayed with particular emphasis on the different responses by demographic characteristics. Students were periodically asked to reflect within small groups during the presentation of the results.

Following the in-class discussion of the experiment, we distributed a survey to assess the students’ perception of the effectiveness of the experiment in increasing student awareness and uncovering personal appreciation of international hunger and poverty issues.

Results

All of the surveys were completed and returned. Table 1 provides summary statistics of a few key demographic characteristics of the class. Females comprised 41% of the students, and 69% of all students report growing up in a rural environment. Students were also asked to indicate the nature of any travel abroad. About 27% of the students had traveled abroad for non-vacation purposes. In response to their political affiliation, 62% of the students indicated that they consider themselves conservative, 30% as moderate, 5% as liberal, and 3% as another political affiliation. We chose not to include the political affiliation as a control variable in the regression since we suspected that it may be difficult to separately identify the effect of rural versus political affiliation on willingness to give. Other demographic characteristics were also collected in the survey but seemed to have minimal effect on willingness to give so they were omitted to simplify the analysis.

Figure 1 shows the average willingness to give across the survey groups. On average, students in the Rokia group were willing to donate \$3.60, while students in the statistical and control groups were only willing to donate \$2.70. Not surprisingly, the results suggest that an identifiable victim elicits stronger empathy than the response to sta-

	Percent of Responses
Female	41%
Geographic Background	
Urban	6%
Suburban	25%
Rural	68%
International Travel	
Non-vacation purposes	26%
Vacation purposes	20%
None	60%
Political Affiliation	
Liberal	4%
Moderate	30%
Conservative	61%
Other	3%

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tistical information. Interestingly, statistical information elicits no stronger empathy than providing no information at all.

Similar findings were revealed for students' willingness to donate their time and willingness to vote for a policy to fund international agricultural development. Students in the Rokia group were willing to donate 1.7 hours, while students in the statistical and control groups were only willing to donate 1.4 hours (see figure 2). The probability of students voting for the policy to fund international agricultural development was 0.9 for

the Rokia group, 0.65 for the statistical group, and 0.77 for the control group (Figure 3).

Most students were willing to vote for the policy that would cost the average taxpayer \$5, but few students were willing to donate \$5. There are several potential explanations for this discrepancy. Students may not consider themselves the "average taxpayer" and assume that taxpayers with higher incomes would bear the primary burden. Alternatively, students may perceive reducing global hunger and poverty as a public good such that their own donation provides small private satisfaction but a policy to essentially force a large group to donate provides substantial private satisfaction knowing that a larger reduction in hunger and poverty is possible.

Another interesting observation from the results is that students were more willing to vote for the policy when presented with the identifiable victim even though the policy was not targeted at benefiting Rokia or her community whereas the donations were phrased as specifically benefiting Rokia and her community. So it appears that the primary mechanism of increasing willingness to give is through creating empathy for those suffering from hunger and extreme poverty through an identifiable victim rather than through a desire to identify the beneficiary of giving.

Table 2 displays the regression results. The effect of the Rokia group on willingness to donate money and vote for the policy was statistically significant at the 10% level indicating that the sample size of 124 is large enough to obtain fairly precise estimates. The effects of most of the demographic variables were not statistically significant, but the sign of the coefficients often conform to prior expectations. Females were more likely to donate money and time – regardless of which survey they received – consistent with the literature that finds females are more empathetic (e.g., see Davis 1983). Females, however, were less likely to vote for the policy but none of the coefficients for the female binary variable were statistically significant. Students from a rural background were less likely to donate money and were less likely to vote yes for the policy and the reduced likelihood of voting for the policy was statistically significant. Some students indicated that they were unwilling to vote for the policy to fund international agricultural development because they felt it would not be in the interest of agricultural producers in the United States.

Another interesting result is that non-vacation international travel was associated with greater willingness to give and vote for the policy, with a statistically significant effect on willingness to donate time. This suggests that study abroad opportunities may be an important method to develop empathy. Self-selection bias, however, may be a concern with this estimate – more empathetic students travel abroad. But one student wrote the following comment that indicates the effect for them was causal: "I spent some time in Africa recently, and that experience showed me just how much people

Figure 1. Average Willingness to Donate Money for each Survey Group

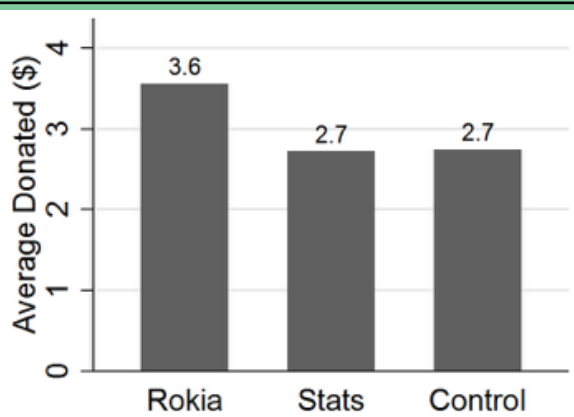


Figure 2. Average Willingness to Donate Time for each Survey Group

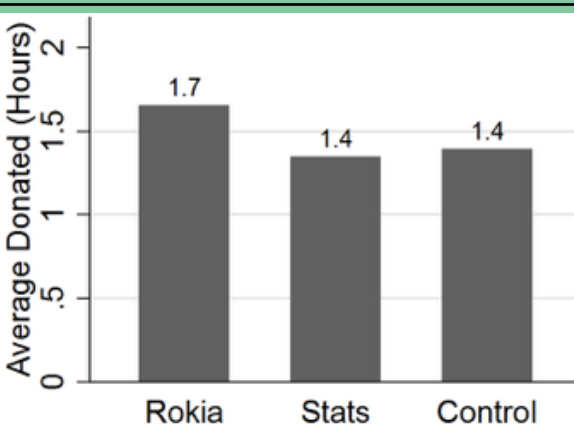


Figure 3: Probability of Voting Yes for a Policy to Fund International Agricultural Research for each Survey Group

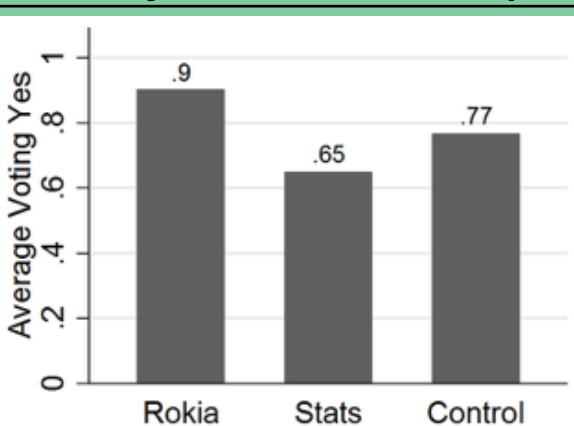


Table 2. Regression Results

Variable	Dependent Variable		
	Money Donated	Time Donated	Vote Yes
Rokia	0.79* (0.427)	0.24 (0.218)	0.13* (0.079)
Stats	0.016 (0.451)	0.02 (0.229)	-0.14 (0.099)
Female	0.34 (0.365)	0.31 (0.188)	-0.12 (0.080)
Rural	-0.25 (0.394)	0.03 (0.200)	-0.13* (0.074)
Non-Vacation	0.18	0.40*	0.13
International Travel	(0.464)	(0.228)	(0.083)
Intercept	2.74** (.495)	1.15** (0.235)	0.89** (0.083)
	0.054	0.071	0.106
Observations	124	124	124

* and ** denote significance at P = 0.1 and 0.05 levels, respectively.
Standard errors are in parentheses.

there need help. They are truly hungry in a way that we cannot understand. Prior to this experience, I probably would not have donated.” This student recognized that they previously lacked empathy – “in a way that we cannot understand” – but felt that the personal experience had changed his or her perspective.

At the end of the survey, we asked students to describe why they chose to give or not to give. Common responses of students in the statistical and control groups for why they chose not to give were that they did not have enough money, that there are already enough problems in the United States to deal with, that it would hurt U.S. agricultural interests, that it is not our responsibility, or that it was not affecting their own life. But in the Rokia group, the only reason that students stated they chose not to give was because they did not have enough money or not enough information on how the money would be used. When students were presented with the identifiable victim, they were unwilling to try to distance themselves from responsibility of an international concern. We ended the presentation of results in class by placing the fictional picture of Rokia on the screen again along with the statement, “Don’t forget that there is always a person behind the statistic.”

Following the experiment, students were asked a series of questions to assess the effectiveness of the experiment (Table 3). The majority of students agreed (73%), or strongly agreed (12%) that the experiment gave them a better understanding of what motivates people to be willing to assist in reducing international poverty. Roughly half of the students agreed or strongly agreed that the experiment had made them more likely to consider using their own resources to reduce international poverty and increased their interest in agricultural issues surrounding global poverty. A large majority of the students (88%) felt that it valuable for future students to participate in the experiment.

Summary

We propose the use of an in-class experiment to assess and develop empathy of students towards international hunger and poverty. One important result from the experiment is that instructors need to consider methods that help students make personal connections with international hunger and poverty in order to motivate student interest in the topic. Presenting statistics is simply not sufficient. Another important outcome is that the experiment can easily be replicated in other classrooms to effectively help students reflect on what impacts empathy towards those suffering from international hunger and poverty.

We do not conclude from the experiment that it is useless to expose students to statistics on global hunger and poverty. Rather, we suggest that statistics also be accompanied by stories, personal experiences, or videos that students can connect with more easily. A related implication is that university study abroad programs may want to make a particular effort to provide travel opportunities to low income countries. It could also be interesting in future work to determine if students are more responsive to different types of statistical information.

We think it is best for other instructors to actually conduct the experiment within their own classes, rather than simply presenting the results from our survey or results from Small et al. (2007). The experiment was effective primarily because students were able to reflect on their own response to the survey and considered how they may have responded differently if the framing had been different. Creating this opportunity for personal reflection may help students recognize that any lack of empathy may be due to the fact that they have not personally experienced hunger or extreme poverty and likely do not have a relationship with a person experiencing hunger or extreme poverty. Replications of the experiment could likely maintain the effectiveness of the experiment while reducing the time expended by eliminating the demographic questions and the regression analysis.

Given that agriculture plays a key role in the livelihoods of the global population that faces hunger and poverty, we think it is important for agricultural students to be aware and empathetic of the issues the global poor face. We found that this in-class experiment was effective in providing a platform for students to reflect on

Table 3: Post-experiment Survey Responses

Survey Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Blank
This exercise has given me a better understanding of what motivates people to be willing to assist in reducing international poverty.	11 (12%)	69 (73%)	14 (15%)	1 (1%)	0 (0%)	0 (0%)
After this exercise I am more likely to consider the value of using my own resources and talents to help reduce international poverty in the future.	5 (5%)	45 (47%)	40 (42%)	4 (4%)	1 (1%)	0 (0%)
This exercise has increased my interest in agricultural issues surrounding international poverty.	11 (12%)	39 (41%)	33 (35%)	8 (8%)	2 (2%)	2 (2%)
	Yes	No				Blank
I feel that it would be valuable for future students to participate in the Rokia Experiment.	84 (88%)	6 (6%)				5 (5%)

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how they perceive global hunger and poverty and the factors that impact their perception. This represents a valuable activity for the future leaders of the food and agricultural sector.

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EFFECTIVE WRITING: AG ALUMNI SAY IT'S ESSENTIAL!

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Introduction

Often, instructors in the College of Agriculture experience difficulties as they attempt to convince students that writing effectively is important. Too frequently students believe that once outside the college classroom, they will not need to write. They therefore take little heed of skills taught in required writing courses, resent writing assignments given in agriculture classes, and fail to enroll in technical writing courses available to them. Sensing students' disregard of writing skills, instructors increase attempts to convince them that the ability to write effectively is essential to success in many agricultural careers. But we lack specific information to support this generalization, and we therefore frequently fail to motivate students to improve writing skills.

In August of 1971 the English Counseling Service of the University of Illinois College of Agriculture surveyed graduates' use of writing skills in agricultural careers. A five page questionnaire was mailed to 660 graduates of the College of Agriculture randomly selected from a list of all graduates from 1923 to 1968. The specific purpose of the study was to ascertain kinds of writing tasks College of Agriculture graduates regularly engage in, the number of hours they devote to writing during an average work week, the value of writing experiences offered in U. of I. courses, and other information useful in motivating students to improve writing skills. Also, the information was sought for use in developing communications curricula for agricultural students.

Forty-four percent of the questionnaires mailed were completed and returned. Questionnaires not completed can be accounted for, in part, by the fact that addresses were in some cases incorrect, several of the recent graduates were overseas on military assignments, and older graduates were retired and therefore decided the questionnaire was not applicable for them. Graduates no longer working in agriculturally related careers also considered the questionnaire not applicable. Still others were deceased.

Findings

The 292 graduates responding to the questionnaire ranged in age from 25 to 72, an average age of 44. Thirty-nine percent of those responding were in professional or technical positions, 38 percent in managerial or official positions, and 17 percent in farming. The remaining 6 percent included craftsmen, housewives, and non-farm laborers. Forty percent were employed by private agencies, 34 percent by governmental agencies, and 21 percent self-employed. Most of those self-employed were farmers.

Respondents were asked, "Do you think the ability to write well is important to persons entering your profession?" Ninety-five percent of those responding to the questionnaire answered "yes." The 5 percent (N=15) who answered "no" included 9 self-employed farmers, 4 persons in managerial positions, 1 craftsman, and 1 non-farm laborer.

Respondents were also asked to indicate the amount of time they spend writing each week. Twenty-four percent indicated that they spend an average of 1 to 2 hours each week writing, and an additional 23 percent spend 3 to 5 hours each week. Another 20 percent spend 6 to 10 hours writing in an average week, 11 percent spend 11 to 15 hours, and 13 percent spend over 16 hours per week. Only 9 percent indicated they do no writing at all. A breakdown of these groups by occupation and employer indicates that 54 percent of those persons who spend 16 hours or more of each week writing are in managerial positions whereas the overwhelming majority (21 out of 26 or 81 percent) of those who do no writing in an average week are in nonmanagerial positions.

Respondents indicated that their writing tasks are varied. Business letters, documented reports, plans of work, and inter-office memoranda require the most time of the greatest portion of the respondents. Other writing tasks include monthly reports, advertisements, technical reports, budget reports, speeches, newsreleases and other journalistic writing, legal documents and miscellaneous reports. Thirty-three percent of the respondents

spend from 15 minutes to 1 hour a week writing business letters. Plans of work also occupy 29 percent of the respondents from 15 minutes to an hour each week, whereas 17 percent spend over an hour each week writing plans of work. Speeches and office memos each involve 29 percent of the respondents between fifteen minutes and one hour per week, and an additional 16 percent spend over one hour per week writing speeches and memos. Thirty-one percent of the respondents spend up to one hour in an average week writing progress reports. The mean number of hours spent by respondents in writing was 7.1 hours.

Over half of the respondents indicated that writing courses they took while at the U. of I. were useful to them. Thirty-five percent also learned useful writing skills in agriculture courses which required lab reports, research papers, and other writing assignments.

Respondents holding managerial positions were asked the following question: "In general, how would you rate the skills in written communication of those persons who apply for positions in your company?" A rating scale of "Very good," "Good," "Don't know," and "Very poor" was provided. Twenty-eight percent of the managers rated applicants' skills as "Poor" or "Very poor" and 37 percent rated them as "Good" or "Very good." The remaining 35 percent could not rate applicants' writing skills.

Many respondents added unsolicited comments to the questionnaire. One 1928 graduate wrote,

I think speech and writing are more important in any line of work than most undergraduates realize. You can make more hay by being able to stand on your feet and talk when called upon, than by being the most able person in your profession if inarticulate.

His remark sums up the attitude of most of the respondents who added personal notes. Several commented that writing skills are closely related to success in agricultural careers. A 1948 graduate noted, "Busy executives demand concise, well-organized technical reports, and justifiably so." Others expressed regret that they had not enrolled in technical writing, report writing, or research reporting courses while students. One noted that "Any skill that will improve an individual's capacity to write simply and briefly would be of great benefit." As a footnote to his comments on the value of speech and writing courses which he took at the U.

of I., a 1961 graduate wrote "These courses would have been more useful had I known their importance and studied." Another graduate stressed that students should realize that a few years after graduation they may be working in an area only remotely connected with what they studied in college. But because writing is important in any career, he recommends thorough preparation for all students.

Conclusion

Overall, the survey shows that effective writing is essential for most graduates of the College of Agriculture; the sheer number of hours that most graduates spend writing is convincing evidence of its significance. It also suggests that in particular graduates who plan to enter managerial positions and "go to the top" will find effective writing an essential.

Findings in the survey have important implications for agriculture faculty and administrators, too. Today a variety of pressures on university administrators and classroom teachers may adversely affect the writing skills of our graduates. Many colleges and universities are reducing the number of writing courses required of students regardless of their writing skills. Budgetary cutbacks which necessitate larger class enrollments limit the time an instructor can devote to evaluation of student writing. Students, particularly those who do not write well, argue that writing assignments are "irrelevant" to agricultural coursework. But the findings from this questionnaire suggest that we do our students no favor if we yield to these various pressures and reduce composition requirements for all students, whether qualified or not, or omit writing assignments from agriculture courses. Our students will be writing once they leave the university. We therefore will be most helpful to them if we provide meaningful writing experiences, familiarizing them with the variety of writing tasks they will face in agricultural careers and helping them perfect writing skills.

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Designing Quality Student Reports in an Agroecosystems Analysis Course

Introduction

One integrative requirement of a week-long summer Agroecosystems Analysis course hosted by four universities from three states is a final student team document (Wiedenhoeft et al, 2003). After visiting farms and interviewing farmers in the Upper Midwest, teams of three to four students prepare an initial oral presentation for instructors and peers in the learning community, followed by a final written analysis addressing the sustainability of each farm. After extensive group interaction to plan their written reports, the teams return home and communicate electronically for the next month to craft a final written team document. In their written reports the groups explain their methods of evaluation, discuss their results, and present their conclusions about the sustainability of each farm. Although they are free to choose their own parameters, the groups often assess sustainability in terms of productivity, economics, environmental impacts and social viability for farms, families and communities (Rickerl and Francis, 2004).

Methods

For each of the last 16 years, approximately 28 students and four instructors have stayed for a week at Dordt College in Sioux Center, Iowa and traveled out each day to visit eight or nine farms and one or two prairies. Pre-course readings describing alternative models of analysis are used to provide students with some background knowledge (Bland, 2007; Hamiti and Wydler, 2014; Conway, 1990; Olson, 1998). After arriving on campus students are assigned to teams based on gender, university, major of study and life experiences. During the first class session students are encouraged to discuss the merits of each of the models. After the discussion each team determines the model or combination of models they will use to analyze the sustainability of a farm system. They often struggle initially with the “open-ended” method of analysis, i.e. no one universal model and how to include multiple components of the model are recommended by instructors. Additionally, some students struggle with the responsibility of deciding what is important and how to collect information and analyze results in the absence of a clear road map to explain exactly how they are to accomplish the task (Francis et al., 2009). This type of case study has no pre-determined “right” answer. Working in teams students utilize information from the farmers and observations made during the visits to

identify the key issues of sustainability for each farm. Final project reports are evaluated by the four instructors in order to achieve consensus on grades and generate comments that are sent to each of the teams to enhance their learning experience.

Over the years we have noticed some patterns in the reports. We have summarized these by identifying 1) favorable sections, types of analysis, and supporting information, and 2) common shortcomings in the reports. This compilation could be of value to future teams in the summer Agroecosystems Analysis course or other student team activities where time is limited and teams need to reach consensus on what is most important to include in a report. The observations of teachers in this set of reports were reinforced by experiences reading reports over the past 16 years from the teams of students.

Favorable Components

Agroecosystems analysis reports generally are well organized, often linear in pattern with a description of the models employed and definitions of key terms. They cover all the farms visited, as per instructions, and seek to cover the four dimensions listed above: production, economics, environment, and social. Some of the common observations of the positive qualities of reports include:

Some reports demonstrate excellent writing and editing, use of spellcheck, and articulate descriptions of farms and the students’ observations; often the observations are quite complete, even when analyses and evaluation are deficient.

Reports sometimes include a brief history of the region, types of farms, crops and systems, and an overall context that sets the stage for the team’s interviews, data collection and analysis, and evaluation within the context of the watershed and region.

Several reports demonstrate creative modifications and combinations of parts of previously-used models from the literature, as presented in the pre-course readings and introduced with examples on the first day of class. Often the combined models are robust and appropriate, although their implementation is highly variable.

Teams often describe the successes and weaknesses of using their particular model, a higher order idea that helps them as well as readers put the results and conclusions into context; this step suggests to teachers additional areas to emphasize in the future.

Teaching Tips/Notes

Some reports include creative and illustrative models and diagrams that visually support the text and provide a quick guide to understanding an overview of the analysis; tables are also useful to provide a quick overview of results and add to a report's value and clarity.

Conclusions to reports generally are useful as an overview of the analyses and comparisons, although student teams at times do not take full advantage of this section to pull together all of the valuable information that has been assembled and processed. Probably this is the weakest section.

Some reports incorporate additional ideas from the learning community that were gleaned from exercises during the oral presentations; this is seen as a way of validating or extending the work of the team to capture more ideas and observations from their classmates.

Sections and Components that Need Improvement

All of us who write reports or manuscripts can improve what we do. It is especially evident that students preparing team documents for the agroecosystems analysis course could improve their final reports and thus their grades by looking carefully at the following observations:

Some of the reports did not include a title and/or a list of authors, thus introducing confusion at the outset.

A number of reports suffered from poor use of English, lack of careful editing, or other lack of attention to organization and detail; tables of contents and clearly labeled sections of the reports make them more accessible and understandable to readers.

Many reports used terms such as "efficiency" or "sustainability" without providing a clear definition of what was meant in their specific reports. Because these words often have multiple meanings depending on context and the system components used and how they are measured, precise definitions are essential.

At times a model is defined and used to evaluate the farms, however, in some cases the utilization is inconsistent causing confusion for the reader; this internal inconsistency may have been the result of multiple authors and a lack of careful editing after assembling the pieces.

Reports often state a number of conclusions without supporting evidence from observations on the farm, information from a farmer interview, or literature citation; this makes for weak statements that could be much improved with some documentation.

Lack of diagrams or figures in a report often leads to a lengthy, repetitive, and boring presentation that is not compelling to the reader; figures can be used to illustrate key components and/or interactions on a farm in the analysis.

Lack of tables often leads to repetitive written summaries of data, e.g. ratings of several indicators, farm by farm, becomes tedious and difficult to grasp, when a simple summary table of the same indicators across farms could be quickly viewed and understood.

Since this is an Agroecosystems Analysis course that is based to great extent on biological and ecological dimensions of the farms, precise mechanistic and engineering-type diagrams showing simple cause and effect relationships may be less appropriate than those that illustrate interactions, complexity, and multiple factors that impact the sustainable workings of a farm.

Ignoring references to the literature suggests that this dimension was not useful to the team in conducting their analysis and evaluation, and including these adds to credibility and completeness.

Using General Observations to Improve Reports

Reviewing the above observations of positive and negative aspects of the reports would be useful for future teams in agroecosystems analysis or in classes where teams are required to develop a written presentation after agreeing on the method of analysis of information and a format for reporting. These observations by instructors represent a careful reading and evaluation of multiple reports, as well as accumulated experience from many years teaching the same course. Teams could first decide on methods and then quickly decide on appropriate sections for a report. The most efficient teams often divide the tasks among members so that it is clear who will do what and when. Once there is agreement and the data and observations are organized and presented in writing or in figures and tables, the entire team can do editing and critique of the document using the above observations as a checklist to emphasize what is positive and fill in the 'potholes' that almost invariably appear in an initial draft of a team document. We hope this reflection on class documents from a summer travel class will be useful to future students and to instructors who provide guidance for such class exercises.

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Submitted by:

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Preparing Job Operation Sheets (JOS) for Laboratory Instruction

Introduction

Having a hands-on laboratory section component to a college course can be both a blessing and a curse. The difference can be what resources are in the instructor's teaching tool box. Providing your students with an opportunity to apply knowledge (cognitive domain of learning) absorbed in the lecture classroom can make the difference between the light bulb turning on in the mind of the student — a sign that they “get it”— and a student who is “lost” because they struggle to make a connection between what they already know (previous knowledge) and what they need to know (new knowledge). The application-stage of learning (psychomotor domain of learning), also referred to as skill development, engages the student to involve multiple senses (sight, sound, smell, and touch) as they complete a task, and the option to reflect on their learning experiences. When the “a-ha” moment is achieved, and student learning is successful, this can have a positively effect on the affective domain of learning (value). This is the “blessing” of the laboratory component. The curse of the hands-on laboratory section component can include extended planning, time to prepare and setup each laboratory meeting, facilitation and supervision of the lab, student engagement, and student safety, responding to individual student needs, assignment assessment and activity closure. If there is no graduate assistance or a preceptor to aid in grading, the supervision and management of the laboratory section can be a daunting task, especially if the instructor attempts to provide one-on-one supervision while other students are requesting assistance.

Job Operation Sheets (JOS)

The Job Operation Sheet (JOS) is a document provided to the student following the demonstration of a performance skill in the laboratory and precedes the student engaging in the directed task. An example is the student is to perform a task such as lighting and adjusting the flame on an oxyacetylene cutting outfit. Following the *Three-Step Demonstration* (see *Effective Demonstrations Teaching Tip*, June 2011), the students are tasked to complete the performance skill at their work station. The JOS for lighting and adjusting the flame on the oxyacetylene cutting outfit are distributed to the students. Information found in a JOS includes a description of the skill or activity, Performance Objective, a list of Tools/Materials, and the Steps of Completion. The JOS contains the steps of procedure for completing the skill or activity and includes key points for the student to consider. These may be safety precautions, or visible signs the student needs to take notice that effect the successful completion of the skill or task. A column for a photograph (easy to incorporate with digital pictures from cell phones), illustration, diagram, or text reference for additional information is a third component of the JOS. A well-constructed JOS will serve as a guide for the instructor performing the *Three-Step Demonstration* to the group of students.

Steps to Complete

The first step to developing the JOS sheet is to identify a suggested sequence for completion:

1. Identify the skill or task to complete.
2. List the performance objectives.
3. Describe and list the tools, equipment and materials needed for the student to complete the task.
4. List the Steps to complete task.
5. Identify and include Key Points (how to do it, such as safety points) at each Step.
6. Include pictures, diagrams, or illustrations for clarity.
7. List reference sources for additional information.
8. Create a self-evaluation scoring rubric for students to complete and submit with the completed skill.

Next, attempt to complete the task following the sequence you developed. A useful exercise is to write the steps of making a peanut butter & jelly sandwich and attempting to complete the task by following your sequence of steps.

JOS Template

The following is a suggested format for a JOS.

Teaching Tips/Notes

JOB OPERATION SHEET UNIT: JOB OR EXERCISE: _____	
<u>TOOLS & EQUIPMENT</u>	<u>MATERIALS REQUIRED</u> <u>REFERENCES</u>
<u>WHAT TO DO (STEPS)</u>	<u>HOW TO DO IT (KEY POINTS)</u>

The format for the JOS can be adjusted to fit the needs of the instructor. Distribute to the students at the completion of the Three-Step Demonstration, when students are to begin work. A well-constructed JOS will provide enough information to minimize students asking questions about steps of the procedure. Attach a scoring rubric for each skill or activity. List the scoring criteria and point values for how you will weigh the scoring of the completed task. Include a column for students to complete a self-assessment of their work next to a column for the instructor's column. Be sure to include safety practices to follow, including wearing safety glasses and any other personal protective equipment (PPE)!

Submitted by:
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Lead with Your History, be Balanced, and Stamp out Ignorance

Over the course of numerous years, I have shared my thoughts on a variety of academic (teaching/learning/advising/career) issues. My thoughts on the squeeze for funding at all levels [1,2,7], use of computers/cell phones in class [3], journal impact factors and citation analysis [4,5,6], optimizing work environments [8,13], job placement and alumni relations [9,14,15], advising graduate students [10,11], and measuring academic success [12] all (basically) relate to obtaining/keeping academic balance over the course of one's career [16,17,18,19]. However, when getting closer to retirement, one's goals and efforts [20] change. It has come to that point for me. I recently submitted my letter of retirement [effective in early 2016]. So, what kind of clever things might I say/share about that?

Never being one to "look back," it seems difficult to do so now. Greater than 30 years ago, students seemed more eager to be in class than they do today. Moreover,

way back when--they seemed to be more apt to come and discuss issues with instructors (face-to-face) in their office.....rather than solicit items (faceless) via electronic means. It used to be that one could write a challenging exam and a student's grade would stand, instead of being challenged to department and upper administration. Also, administrators used to stand-up for faculty, who were in the teaching trenches, in all matters. However, it seems that today-students are more entitled, vocal, less disciplined and more likely to disrupt classrooms than to learn within one. Even with the change in students, administrators and easing university policies-- I have loved my time as a teacher, guidance counselor, mentor, coordinator, advisor, and (in some ways) role model.

All of this will be gone, when I retire. Or....will it? I will have had some impact on a goodly number of students/ alumni, who [some already have] will become producers, administrators, teachers, medical professionals and (yes) politicians [to name a few]. Can I live with that? Can I live without the day-to-day grind of driving for 45 minutes each way-sometimes in terrible weather? Can I live without the after hour phone calls; hundreds of emails per day; or hours of grading, writing, discussing and thinking about work? Yes-- I can. It will be easy, as I can (instead) remember the great number of positives obtained from academic work of all kinds [21-26]. Others may now take over, do a better job, and make their mark. My advice to them would be as it always has been: "Lead with your history, be balanced [27] and stamp out ignorance." This has worked well for me for over 30 years. Perhaps, it could work for others for the next 30 years...

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2015 NACTA Conference Report



2015 NACTA Annual Conference

The 2015 NACTA Conference was held at The University of Georgia – Athens, June 16 – 20, where over 300 people attended oral presentations, poster presentations, workshops and the annual business meeting. The theme for this year's conference was "Teaching On My Mind." The NACTA Executive Committee and membership express their appreciation to Dr. Jean Bertrand and the local planning committee of another very successful conference.

During the NACTA Awards presentation on Friday, June 19, awards were presented for NACTA Journal articles, Judging and Student Service, Graduate Student Teaching, Educators, Teaching Scholars, Teaching Award of Excellence, Murray Brown Leadership, and Distinguished Educator. Also, during the NACTA Awards presentation, William Nelson, President of CHS Foundation, announced a \$300,000.00 grant for NACTA to be used over the next three years to increase members and to develop sustainability.

The annual business meeting minutes and the NACTA Secretary's and Treasurer's reports follow.

NACTA Business Meeting Minutes, Thursday, June 19, 2015, 12:30pm

University of Georgia-Magnolia Ballroom

The Business meeting was held at the end of the Thursday noon luncheon. There were approximately 210 in attendance.

President Bonnie Walters called the meeting to order. First time NACTA Conference attendees were recognized. NACTA Executive Committee members were introduced. Thank You to Jean Bertrand, Conference Host Chairman, University of Georgia. Thank you to first-time presenters at the conference.

Reports presented:

Secretary/Treasurer – Marilyn Parker

- Amount in NACTA checking account – approximately \$59,000; memberships major factor in keeping NACTA financially viable
- We can use GoPayment for NACTA membership payments
- Approximately 200 members revolve in/out of NACTA each year
- 108 Institutions
- 6 new life memberships; Thank you to all Life members
- Encouraged NACTA members to vote for officers; used SurveyMonkey this year and had better response

- Encouraged Teaching Award of Merit Certificates – 58 this year (72 last year)
- Montana State University contributed \$7421 to the NACTA Foundation from the conference
- Silent auction book sale contributed \$2317 (\$1257 from Bob Gough's donated books)
- \$5000 received first week of June 2014 from CHS for help with creating the Awards Program booklet and the Abstract booklet for the Montana State University 2014 NACTA conference participants
- Appreciation for Karen Earwood and Miriah Pace in varied aspects of NACTA work

Journal Editor Report – Rick Parker

- Manuscripts have doubled since 2006 – 12-14 published each issue
- 60 members on Editorial Board
- 270 Abstracts submitted for conference this year; author guidelines on website
- 4 Websites/Pages maintained; Facebook has 705 "likes" up from 575 last year
- For 2014 – 17 Teaching Tips submitted; 4 Book Reviews
- All posters entered into the contest this year
- Teaching Tips/Notes are on the website
- Proposal from JSTOR

Membership Chairman -

Ron Hanson / Jeannette Moore

- We have 30 NACTA ambassadors for regions: Eastern-4; Central-7; Western-7; and Southern-12; appreciation for those who have volunteered
- Information paper on the luncheon table is to encourage NACTA memberships

Unfinished Business – Bonnie Walters

- Shirt store – continuing to set up

New Business

- The date for awards and abstract submissions will be moved up one month to accommodate University of Hawaii conference preparations

Election Results

- President-elect – Tracy Dougher, Montana State University
- Eastern Region Director-elect – John Ewing, Penn State University
- Southern Region Director-elect – Nick Fuhrman, University of Georgia
- Western Region Director-elect – Ingelia White, Windward Community College, HI

Committee Chair Appointments

- Teacher Recognition Committee – Wendy Warner (NCSU), will be the new Chair replacing Nick Fuhrman

NACTA Business Meeting recessed for Foundation Meeting

NACTA Foundation meeting report

- Amount moved from the Foundation to the Checking account for awards - \$5250; accountant fees \$1883
- Miscellaneous donations of \$300 from long time NACTA members
- After many discussions and a period of time, the NACTA Executive Committee made a decision to move the NACTA Development funds from the University of Wisconsin, Platteville Foundation and place into the NACTA Savings account until it was decided where to invest the funds. Jeff Hattey, NACTA Foundation Vice-Chair, wrote the letter of request to the UW Platteville coordinator, Kim Govier, and the funds were mailed by check and deposited into the DL Evans NACTA savings account on 10-27-14. The check was for \$119,730.11
- Amount in savings account at DL Evans, Rupert, Idaho - \$141,711 (includes previous savings and monies from University of Wisconsin-Platteville)
- Motion to approve report passed.

NACTA Business Meeting reconvened

Presentation from University of Hawaii – Charly Kinoshita, host Committee Chair for 2016 Conference

Business Meeting adjourned at 1:30 pm.

During the Business Meeting the Secretary's and Treasurer's Reports were given. A motion to accept these reports was made, seconded and passed.

Secretary's Report

General

- Membership records maintained in Microsoft Excel
- Records include contact information (no phone numbers), payment type, membership code/region, unique membership number (no credit card numbers are kept on file)
- Administrative side of the NACTA website provides tools to make better use of the data
- We have used MailChimp for e-Newsletters for information and reminders

Memberships – New and Renewals

- Emails sent to individuals in the fall; two reminders are sent after that time
- Payment taken by check, credit card (VISA or Mastercard) by PayPal (online), fax or mail, or by calling the secretary. Intuit Quickbooks is being

implemented as well with *GoPayment* being used with iPads.

- Members continue to take advantage of the 3-year membership option
- New members receive a "Welcome to NACTA" letter through email and their name is given to the regional director. Regional directors also send a letter of welcome
- Membership listings can be requested by regional directors; individual listings for a particular school can be/are requested for membership reminders or recruiting

Membership –

- Institutions – 108 (includes one new institution/four did not renew)
- Individuals – 650 (approximately – includes Institutional Active, Active, Life Members, Emeritus, and Graduate Students)
- Libraries – 45
- Life Members – 151 (includes 6 new)
- Turnover in memberships continues to be approximately 200 per year

Universities/Colleges –

- Institutions receive an email with an invoice for renewal in the fall; reminders are sent again in February and April
- New institutions: Ball State University, Indiana, for Judging Conference
- Those institutions which pay for individual memberships (1-3 year memberships), or either a one-time payment, or a yearly renewal: Purdue University, University of Illinois, University of Florida, Penn State University, Virginia Tech, Sam Houston State University
- Colleges not renewed: Auburn University, Auburn, AL, Berea College, KY, Southeast Missouri State University, Cape Girardeau, MO, Wilmington College, OH, Kwantlen Polytechnic University, Surrey, BC

Note: If you are aware of changes in deans of schools, please let the secretary know

Canada / Foreign Members, Institutions, Libraries (numbers included in above count)

- Canadian members – 10 / Foreign members – 3
- Institutions – 5
- Libraries – 2 Canadian / 3 Foreign

Teaching Award of Merit / Graduate Student Certificates

- Member institutions receive notification by email when they renew and another reminder in February or March for the certificates (we are willing to 'overnight' a certificate)
- Total 58 certificates awarded this year (46 Faculty and 12 Graduate students) which is down from last

2015 NACTA Conference Report

year (72 total last year)

- Mix of NACTA member and non-member
- Continued importance and awareness of this award to institutions

Online Voting

- Approximately 190 votes were cast for the officer elections
- We used Survey Monkey for the voting this year and there was double who participated.
- *Action Item:* Encouraging new memberships and retaining memberships is an ongoing theme. Why did 200 members not renew for 2015?

The NACTA Secretary appreciates the additional help of Karen Earwood and Miriah Pace with the varied aspects and responsibilities of the NACTA work.

Submitted by:
Marilyn Parker
Secretary
June 2015

Treasurer's Report

Membership dues

- Major factor in keeping NACTA financially viable
- Critical to maintain current membership levels or increase
- Dues increase in June 2007 has been beneficial
- Three-year membership payment option is working well
- Those paying the life membership through the \$200 per year plan is working well
- Membership dues paid through PayPal or QuickBooks /Intuit has saved on credit card fees

Profit and loss statement

- Created by QuickBooks
- The accounting firm of Deagle & Ames in Twin Falls, Idaho conducted a compilation of the financial records of NACTA to verify the records and accounting process
- This report is for the NACTA checking and savings account and maintained at DL Evans Bank in Rupert, Idaho
- Detailed Profit & Loss statement is available for any NACTA member
- Beginning Assets: \$59,766 / Ending Assets: \$56,621 – Loss of \$3,154
- Currently in PayPal (6-13-15) \$1,400 that has not been transferred to the NACTA account

Income sources (additional)

- Montana State University – \$7421 was deposited into the Foundation Savings account, November 2014
- Silent Auction Books sales at the conference through books donated by Cheryl Moore- Gough on behalf of Bob Gough and by Cengage; these monies support the EB Knight, Jack Everly, and Bob Gough Teaching Tips awards; total amount received \$2317 (\$1257 from Bob Gough books- Cheryl was acknowledged at the Banquet and NACTA was happy to send a Thank You to her)
- Royalties from ProQuest and Gale (Cengage) double from last year
- \$4000 received through Kirby Barrick for the USDA Teaching Workshop; deposited into the Foundation Savings account October 2014

Donations

- CHS donation of \$5000 received the first week of June 2014 for the development and printing of the Awards Banquet Program booklet and Abstract booklet (Volume 58 Supplement 1) for all Montana State University conference participants

Expenses

- Administrative help has doubled for help with the Journal, website/Facebook upkeep, conference preparation, membership maintenance (individuals, institutions, libraries)
- Accountant help was more due to Foundation work which will not be as much next year (the work specifically for the Foundation was paid from the Foundation Savings account)

Bank Balance

- Bank statement for the checking account ending May 2015 is \$59,427. (PDF of Disbursements attached separately)

Submitted by:
Marilyn Parker
NACTA Secretary/Treasurer
June 2015

NORTH AMERICAN COLLEGES & TEACHERS OF AGRICULTURE, INC.
 STATEMENTS OF ACTIVITIES
 FOR THE YEARS ENDED MAY 31, 2015 AND MAY 31, 2014

	<u>May 31, 2015</u>	<u>May 31, 2014</u>
<u>Revenue, Gain and Support</u>		
Membership dues	\$ 66,952	\$ 62,216
Royalties income	2,035	1,068
Foundation awards	5,250	3,500
Position announcements	100	100
Grants and contributions	5,000	-
Conference income	2,369	4,661
Miscellaneous income	85	1,976
	<u>81,791</u>	<u>73,521</u>
<u>Expenses</u>		
Awards	5,300	4,100
Bank charges	538	20
Conference expense	9,364	10,263
Credit card fees	493	1,010
Honorariums	24,006	20,244
Insurance	150	150
Journal expense	12,556	10,749
Miscellaneous expense	8	79
Office expense	94	193
Membership refunds	50	-
Postage	927	1,849
Professional fees	2,957	1,155
Telephone	114	-
Meetings	657	544
Foundation dues	2,935	2,205
Administration	10,314	5,117
Supplies	1,699	1,010
Travel	8,743	3,439
Website expense	4,040	3,650
	<u>84,945</u>	<u>65,777</u>
Total Expenses	<u>84,945</u>	<u>65,777</u>
Increase (Decrease) in Net Assets	(3,154)	7,744
Net Assets - Beginning	<u>59,766</u>	<u>52,022</u>
Net Assets - Ending	<u>\$ 56,612</u>	<u>\$ 59,766</u>

See Accountants' Compilation Report.

DEAGLE, AMES & CO.
 CERTIFIED PUBLIC ACCOUNTANTS



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, NACTA Educator Award, NACTA Teaching Scholar Award, NACTA-John Deere Award, Teaching Award of Excellence, Distinguished Educator, Graduate Student Teacher Awards and NACTA Judging and Student Service.

**To become a member register online at
<http://www.nactateachers.org/online-membershipapplication-renewal.html>
 or complete and mail in the following form.**

Membership Categories (check one):

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



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 1-208-957-7001

Name on Card: _____

Card Number: _____

Expiration (month/date): _____

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

Send your completed form to:
Marilyn B. Parker
NACTA Secretary/Treasurer
151 West 100 South
Rupert, ID 83350

**For more information visit the NACTA website:
www.nactateachers.org
 or email nactasec@pmt.org**

NACTA Committee Members

2014-2015*

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Kirby Barrick, University of Florida
Michelle Burrows, University of Nevada, Reno
W. Stephen Damron, Oklahoma State University
Sam Doak, Virginia Tech
Kevin Donnelly, Kansas State University
Will Farmer, North Carolina State University
Harry Field, Oklahoma State University
Jean Gleichsner, Fort Hays State University, KS
Kelsey Hall, TX Tech University
Lynn Hamilton, California Polytechnic State University
Alan Hansen, University of Illinois
Ronald J. Hanson, University of Nebraska-Lincoln
Cindy Haynes, Iowa State University
Jennifer Henke, University of California
Robin Peiter Horstmeier, University of Kentucky
Dann Husmann, University of Nebraska-Lincoln
Donald M. Johnson, University of Arkansas
David Jones, North Carolina State University
Prasanta Kalita, University of Illinois
Angela Kent, University of Illinois
Thomas Kuzmic, Oklahoma State University
Mickey Latour, Southern Illinois University
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