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The Influence of Motivations and Social Barriers on Undergraduate Students' Interest in Participating in National Conferences

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Abstract

Participation in extracurricular activities contributes many positive effects on a student's overall collegiate educational experience. One important activity is participation in national conferences. To understand the factors that motivate and inhibit participation in national student focused conferences, a survey was developed and distributed to participants at the National American Collegiate Horseman's Association (ACHA) convention. Results of this study suggest that as personal and employment motivations increase and perceived social barriers decrease, interest in participating in collegiate ACHA events increases ($F_{chg(3, 81)}$=6.14, p<0.01). Personal and employment motivations and social barriers to participation predict 47% of the variability in interest in participating in collegiate events. This creates a need for advisors to construct a welcoming environment that focuses on decreasing social barriers, which in turn can increase participation and the benefits students receive from involvement in collegiate activities.

Introduction

While students receive intensive and complete science-based educations during pursuit of their undergraduate degree, students need to be exposed to available career paths, leadership opportunities and current industry topics from a national perspective (Kuh, 1995). Involvement in student organizations and extracurricular activities presents multiple opportunities for students to participate in these experiences. Studies have shown several reasons why students are drawn to participate in extracurricular activities including increases opportunity for cooperation among students (Abrahamowicz, 1988; Astin, 1996; McNeal, 1995; Trascarella and Terenzini, 1991), facilitates advisor-student relationships (Abrahamowicz, 1988; Campbell and Campbell, 1997; Mahoney, 2000; Posner and Vandell, 1999; Retallick and Pate, 2009), increases skill and leadership building opportunities (Birkenholz and Schumacher, 1994; Ewing et al., 2009; Layfield et al., 2000; Mahoney, 2000;), and helps to create a more positive perception of their courses and overall collegiate experience (Mahoney and Cairns, 1997; Suvedi and Heyboer, 2004). Additionally, Mahoney and Cairns (1997) found that the effect on students and overall participation increased when interest-based organizations were offered to meet students' individual needs. However, a study focused on the level of student involvement demonstrated that student motivation for participation in extracurricular activities changes over the course of their undergraduate career. Initially, students cite social reasons for joining extracurricular activities, but throughout the course of their academic careers they become more vocationally motivated (Randall et al., 2016). Despite the comprehensive list of positive reasons for student participation in collegiate organizations, perceived or realized barriers can still impact student engagement in learning opportunities (Al-Ansari et al., 2016; Jenkinson and Benson, 2010). Barriers can be anything that restrain or obstruct progress. They can be social, economic, time, or support related. If not addressed, perceived barriers can lead to diminished participation in valuable educational activities (Albert and Luzzo, 1999), which will ultimately have a negative effect on student overall educational experience.

The American Collegiate Horseman's Association (ACHA) is a national student-run organization with the goal of unifying collegiate horsemen of all levels and disciplines through the promotions of leadership, education, service, and national affiliations. Each year

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the ACHA holds a National Convention at which all schools affiliated with the organization are invited to attend and experience different aspects of the horse industry and various employment and higher education opportunities available across the country. The National Convention is hosted by a different university each year. Experiencing current events and topics relevant to the needs in the equine industry is an important component of a student's well-rounded education (Walker et al., 2015). The ACHA Convention provides a venue where students can collaborate with other advising equine faculty members and participate in training sessions. These experiences have the opportunity to affect the way students perceive the industry and its needs while emphasizing out of classroom educational opportunities.

To better understand the interaction of student interest and participation with variables like perceived barriers, ecological systems theory, theory of planned behavior, and a general model of motivated learning all underpinned this study (Bronfenbrenner, 1979; Fishbein and Ajzen, 2009; Pintrich and Schunk, 2002). Ecological systems theory proposes that all of an individual's social contexts influence learning, while the theory of planned behavior suggests that social norms, in the form of the pressure an individual feels from significant others, impacts behavior (Bronfenbrenner, 1979; Fishbein and Ajzen, 2009). Together, these theories provide a context for understanding how social systems outside of the immediate (e.g., the student organization) affect students' interest, and ultimate participation, in opportunities like the national ACHA convention. Finally, Pintrich and Schunk's (2002) general model of motivated learning illustrates how these variables interact together through pre-task, during task and post-task phases of learning to reduce the power of perceived barriers. For example, advisor support can encourage participation, particularly when student values and outcome expectations are activated.

The purpose of this study was to determine if a model exists that explains collegiate ACHA members' interest in participating in national ACHA events. The objectives of the study include the following:

1. To describe ACHA student conference participants' perceived motivators and barriers to and interest in attending national ACHA events.
2. To determine if the addition of the variable social barriers improved the prediction of interest in participating in ACHA beyond that provided by perceived personal and employment motivations.

Methods

This exploratory study used a cross-sectional design to explain collegiate ACHA members' interest in participating in national ACHA events.

Population and Sample

Eighty-nine (n=89) out of 103 (86.4%) students attending the 2015 annual national American Collegiate Horseman's Association convention participated in this project. Of the respondents, 88.6 % were female and 11.4% were male. Most participants were seniors (35.2%) and juniors (28.4%); however, sophomores (19.3%) and freshmen (17%) also participated. Most participants reported living in a rural area (60.5%), while 36% reported living in a suburban location and 3.5 % in an urban environment. Participants were also asked to categorize their involvement in the equine industry. A majority (85.4%) indicated that they participated in the recreational aspects of the industry. A little over half (55.1%) indicated they participated in the competition aspect of the industry, and 50.6% indicated that they were employed in some aspect of the equine industry.

Instrument

Personal motivations for participating in national ACHA events (Personal Motivations). The construct was operationally defined as factors unique to the individual that encourage participation in national ACHA events. One example of an item in this construct was "Attending national ACHA events is important for my personal development." The Personal Motivations subscale consisted of three items adapted from Bunch et al. (2016). The items were adapted by changing the focus from 4-H international experiences to an ACHA and equine industry focus. Psychometric analysis revealed that the items explained 48.6% of the variance in personal motivations for participation in collegiate ACHA events. The items had a 0.85 Cronbach's alpha reliability estimate.

Employment motivations for participating in national ACHA events (Employment Motivations). The construct was operationally defined as career related factors that drive participation in national ACHA events, like "Attending national ACHA events will increase my employability." The Employment Motivations sub-scale consisted of two items adapted from Bunch et al. (2016). The items were adapted by changing the focus from 4-H international experiences to an ACHA and equine industry focus. Psychometric analysis revealed that the items explained 16.8% of the variance in employment motivations for participation in collegiate ACHA events. The items had a 0.71 Cronbach's alpha reliability estimate.

Personal barriers to participating in national ACHA events (Personal Barriers). Individual factors that serve as deterrents to participation in national ACHA events was used as the operational definition of the construct. "I am intimidated by the thought of engaging in a national ACHA activity" is an example of one of the items. The Personal Barriers sub-scale consisted of five items adapted from Bunch et al. (2016). The items were adapted by changing the focus from 4-H international experiences to an ACHA and equine industry focus. Psychometric analysis revealed that the items explained 12.2% of the variance in personal barriers to participation in collegiate ACHA events. The items had a 0.79 Cronbach's alpha reliability estimate.

Academic barriers to participating in national ACHA events (Academic Barriers). Academic factors that served as barriers that hindered participation in ACHA events was used as the operational definition of the construct. "My academic programs do not encourage me to participate in national ACHA opportunities" is one example of an item from the sub-scale. The Academic Barriers sub-scale consisted of four items adapted from Bunch et al. (2016). The items were adapted by changing the focus from 4-H international experiences to an ACHA and equine industry focus. Psychometric analysis revealed that the items explained 6.8% of the variance in academic barriers to participation in collegiate ACHA events. The items had a 0.81 Cronbach's alpha reliability estimate.

Social barriers to participating in national ACHA events (Social Barriers). Social barriers consist of pressures from influential people in a person's life, like parents, peers, mentors, or employers who may discourage participation in ACHA events. The Social Barriers sub-scale consisted of four items adapted from Bunch et al. (2016). The items were adapted by changing the focus from 4-H international experiences to an ACHA and equine industry focus. Psychometric analysis revealed that the items explained 35.5% of the variance in social barriers to participation in collegiate ACHA events. The items had a 0.84 Cronbach's alpha reliability estimate.

Perceived interest in participating in national ACHA events (Interest). The construct was operationally defined as factors affecting a person's perception of the appeal of participating in national ACHA events. The opportunity to network with people sharing similar interests is an example of one factor that influenced interest. The Interest sub-scale consisted of four items developed by the researchers specifically for this study. Psychometric analysis revealed that the items explained 42.1% of the variance. The items had a 0.74 Cronbach's alpha reliability estimate.

Data Collection

A survey was created to assess student perception of the benefits of participating in an equine-focused collegiate association. A paper survey was made available during the 2016 national convention and collected on the last night of convention. The survey included 15 questions, including demographic information such as age, gender, academic classification, and environment in which they lived. Additionally, participants were asked to respond to a variety of questions on a 4-point and 6-point Likert-type scale regarding 1) their involvement in the equine industry, 2) academic expectation confidence, 3) career expectations, 4) interest in attending national convention, 5) motivation for attending national convention, and 6) barriers to attending national convention. The survey procedures were deemed exempt by the Louisiana State University Agricultural Center's Institutional Review Board (IRB).

Data Analysis

Study objective one was descriptive in nature. The three constructs, motivations, barriers, and interest, were interval in nature; thus means and standard deviations were computed. Study objective two sought to determine the contribution of perceived motivations and barriers to interest in participating in collegiate ACHA events. Hierarchical regression was used to control the order of entry of variables in the regression process (Tabachnick and Fidell, 2007). Univariate outliers were assessed by inspection of variable z-scores. The criterion for identification of univariate outliers was $p<0.001$ ($z >\pm3.29$). Multivariate outliers were assessed using a $p<0.001$ criterion for Mahalanobis distance. Since there were five independent variables, the critical value for chi square was 20.5.

Results and Discussion

The purpose of objective one was to describe the motivation and barriers to as well as the interest in attending national ACHA convention. Students had a relatively high interest in attending the National ACHA Convention. Students also self-reported to be motivated by the possibility of employment networking and other personal motivators. Academic and social barriers did not influence students' motivation to attend. However, this result is not surprising due to the highly motivated nature of students involved in topic focused organizations. This can also be due to data collected from a population of students with very similar goals and aspirations. It is possible that groups of students who all have professional career goals would perceive that the benefits of attending a national convention outweigh the potential effects of the associated barriers.

The purpose of objective two was to determine if the addition of the variable barriers to participation in collegiate ACHA events improved the prediction of interest in participation beyond that provided by perceived motivations for participation. Cases with missing data were excluded from the analysis. Two influential univariate outliers were identified and removed from the analysis. No multivariate outliers were detected.

Table 2 displays the unstandardized regression coefficients (B) and intercept, and the standardized regression coefficients (B) after entry of all independent variables. R was significantly different from zero at the end of step one, $R^2=0.39$, and at the end of step two, $R^2=0.50$. $R^2=0.50$ had a 95% confidence limit of 0.31 to 0.59, $F_{(5, 81)}=16.26$, $p<0.05$. The adjusted R^2 value of

Table 1. Means and Standard Deviation for Student Interest, Motivation, and Barriers in Attending National ACHA Convention

Variable	M[1]	SD
Interest	5.20	0.64
Employment Motivation	3.44	0.60
Personal Motivation	3.54	0.55
Personal Barriers	2.00	0.55
Academic Barriers	1.60	0.51
Social Barriers	1.38	0.43

[1]Used a 6-point Likert-type scale (1 = not motivated at all, 2 = slightly unmotivated, 3 = unmotivated, 4 = slightly motivated, 5 = motivated, 6 = very motivated).

Table 2. Hierarchical Multiple Regression for Perceived Interest in Participation in Collegiate ACHA events and Motivation and Barrier Variables

Model	B	SE B	*B*	95% CI
(Constant)	3.86	0.51		
Employment Motivation	0.37	0.10	0.35***	[0.18, 0.56]
Personal Motivation	0.27	0.12	0.23**	[0.04, 0.50]
Personal Barriers	-0.07	0.11	-0.06	[-0.30, 0.15]
Academic Barriers	-0.24	0.14	-0.19	[-0.52, 0.03]
Social Barriers	-0.27	0.14	-0.19*	[-0.54, -0.003]

*p<0.05. ** p<0.01. *** p<0.001

0.47 indicates that approximately 47% of the variability in interest in participating in collegiate ACHA events is predicted by personal and employment motivations and social barriers to participation. The change in F from a simple model of employment and personal motivation predicting interest to both personal and employment motivation and social barriers predicting interest was significant ($F_{chg(3, 81)}$=6.14, p<0.01). As personal and employment motivations increase and perceived social barriers decrease, interest in participating in collegiate ACHA events increases.

Summary

The benefits of student participation in extracurricular activities have been documented in a variety of studies (Abrahamowicz, 1988; Astin, 1996; Birkenholz and Schumacher, 1994; Campbell and Campbell, 1997; Ewing et al., 2009; Layfield et al., 2000; Mahoney, 2000; McNeal, 1995; Posner and Vandell, 1999; Retallick and Pate, 2009; Trascarella and Terenzini, 1991). When students increase participation in extracurricular activities, like the national conference reported here, they may benefit from advisors who focus on reducing perceived social barriers to participation. Social barriers refer to the people who express disapproval of a person's actions. In this study, the impact of parents and peers on discouraging participation was explored. Advisors may help create a more inclusive environment, helping students to benefit from new experiences. In this study, social barriers are off-set by the perceived importance of activities that may enhance employability. Therefore, offering activities that allow participants to gain valuable experience, to increase skillsets, and to enhance their resumes is important to promote increased participation. Another tactic to reduce the negative effect of social barriers is to focus on experiences that increase personal development and life experience. For example, the ACHA has been successful in retaining participants by offering networking opportunities within the industry and among peers from other states, by providing hands on educational opportunities in topics that are unique to the host location, and by offering opportunities to practice leadership techniques through interviewing industry professionals, running business meetings, and leading group sessions (Walker et al., 2015). Floerchinger (1998) reported that participation in student associations has shown 1) increased retention, 2) enhanced personal skills, 3) positive influence on leadership, communication, teamwork, organization, decision making and planning skills, 4) greater satisfaction with their college experience, 5) useful job procurement skills and experience, and 6) lasting views on volunteering and community service. Future research should consider if participation in national organizations like the ACHA produces the same benefits.

Literature Cited

Abrahamowicz, D. 1988. College involvement, perceptions and satisfaction: A study of membership in student organizations. Journal of College Student Development 29: 233-238.

Al-Ansari, A., F. Al-Harbi, W. AbdelAziz, M. AbdelSalam, M.M. El Tantawi and I. ElRafae. 2016. Factors affecting student participation in extra-curricular activities: A comparison between two Middle Eastern dental schools. The Saudi Dental Journal 28: 36-43.

Albert, K.A. and D.A. Luzzo. 1999. The role of perceived barriers in career development: A social cognitive perspective. Journal of Counseling and Development 77: 431-436.

Astin, A.W. 1996. Involvement in learning revisited: Lessons we have learned. Journal of College Student Development 37: 123-134.

Birkenholz, R.J. and L.G. Schumacher. 1994. Leadership skills of college of agricultural graduates. Journal of Agricultural Education 354: 1-8.

Bronfenbrenner, U. 1979. The ecology of human development: Experiments by nature and design. Cambridge, MA: Harvard University Press.

Bunch, J., M. Cater and S. Danjean. 2016. 4-H members' motivating factors for and deterrents to participation in an international experience program: Development of the 4-H international experience program questionnaire. Manuscript submitted for publication.

Campbell, T.A. and D.E. Campbell. 1997. Faculty/student mentor program: Effects on academic performance and retention. Research in Higher Education 38: 727-742.

Ewing, J.C., J.A. Bruce and K.G. Rickets. 2009. Effective leadership development for undergraduates: How important is active participation in collegiate organizations? Journal of Leadership Education 7: 118-131.

Fishbein, M. and I. Ajzen. 2009. Predicting and changing behavior: The reasoned action approach. New York: Taylor & Francis.

Floerchinger, D.S. 1998. Student involvement can be stressful: Implications and interventions. Campus Activities Programming 216: 60-63.

Jenkinson, K.A. and A.C. Benson. 2010. Barriers to providing physical education and physical activity in Victorian state secondary schools. Australian Journal of Teacher Education 35: 1-17.

Kuh, G.D. 1995. The other curriculum: Out-of-class experiences associated with student learning and personal development. Journal of Higher Education 66: 123-155.

Layfield, K.D., R.B. Radhakrishna and R.J. Andreasen. 2000. Self-perceived leadership skills of students in leadership programs in agricultural courses. Journal of Southern Agriculture Education Research 501: 62-68.

Mahoney, J. 2000. School extracurricular activity participation as a moderation in the development of antisocial patterns. Child Development 712: 502-516.

Mahoney, J. and R. Cairns. 1997. Do extracurricular activities protect against early school dropout? Developmental Psychology 332: 241-253.

McNeal, R. 1995. Extracurricular activities and high school dropouts. Sociology of Education 68: 62-81.

Pintrich, P. and D. Schunk. 2002. Motivation in education: Theory, research, and applications 2nd ed. Upper Saddle River, NJ: Merrill/Prentice Hall.

Posner, J. and D. Vandell. 1999. After-school activities and the development of low-income urban children: A longitudinal study. Developmental Psychology 353: 868-879.

Pracz, A. 2011. Extracurricular activities in college are just as important as academics. http://northernstar.info/opinion/columnists/article_27e82362-76d0-11e0-1bc9-001a4bcf687. September 2016.

Randall, M.E., R.W. Podell, W.D. Hyman, M.L Borner and S. Putnam. 2016. Extracurricular activities: Why do students participate and what do students gain? https://www.bowdoin.edu/news/archives/images/Extracurricular%20Activities%20Abstract.pdf. September 10, 2016.

Retallick, M.S. and M.L. Pate. 2009. Undergraduate student mentoring: What do students think? NACTA Journal 531: 24-31.

Tabachnick, B. and L. Fidell. 2007. Using multivariate statistics. Boston, MA: Pearson Education, Inc.

Terenzini, P.T. and R.D. Reason. 2005. Parsing the first year of college: A conceptual framework for student organizations in college of agriculture. Paper presented at the meeting of the Association for the Study of Higher Education. Philadelphia, PA.

Walker, N., J. Leatherwood, R. Brooks, C. Smith, S. TenBroeck, K. Vernon, K. Waite, M. Volgesang, B. Egan, E. Berg and J. Miller. 2015. National American Collegiate Horsemen's Association Convention: An effective equine educational venue. Journal of Equine Veterinary Science 35: 453-454.

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Abstract

Student enrollment in colleges of agriculture is stagnant. A shortage of qualified candidates adequately prepared via a rigorous curriculum, standards, and assessment practices exists, further increasing the lack of alignment between secondary and higher education. Dual enrollment courses can increase college preparation for future graduates and help students succeed. Dual enrollment allows high school students to take courses while dually enrolled in corresponding college work. The Concerns Based Adoption Model frameworks for levels of use and stages of concern guided this study. The dual enrollment program was found to have a positive impact on students taking more rigorous courses and gaining a more in-depth knowledge of agriculture. Administrators indicated this program helped in establishing higher standards in coursework, enhancing campus prestige and the reputation of the agriculture program. Administrators saw that the program benefited in preparing students for what college is "really like". Research focused on the pedagogical approaches of how dual enrollment offerings benefit the creation of future high quality dual credit courses.

Introduction

It is a commonly held feeling among educators that a lack of alignment in curriculum, standards, and assessments between high school and higher education exists (Bailey et al., 2002; Barnett and Hughes, 2010). Annually, almost 60% of first-year college students discover that, while fully eligible to attend college, they are not academically ready for postsecondary studies (National Center for Public Policy and Higher Education and Southern Regional Education Board, 2010). This problem is exacerbated in minorities and students from low socioeconomic backgrounds (Balfanz and Legters, 2004). To be successful in college, secondary students must have appropriate academic content preparation, learn academic behaviors, cognitive strategies such as analytic thinking, and be able to understand college culture (Zeidenburg and Bailey, 2009). This has in turn affected the agriculture industry as there continues to be a shortage of qualified graduates for jobs within the United States (Goecker et al., 2010). One reason for this shortage could be contributed to stagnation of student enrollment in agricultural majors (National Student Clearinghouse, 2017).

A program which can help to increase college preparation for future graduates is the agriculture dual enrollment program. While dual enrollment/dual credit courses have been in use for many years, agriculturally based dual enrollment programs are not as prevalent, especially at the university level in comparison to the junior college level. Dual enrollment courses allow high school students to enroll synchronously in their usual high school courses and a corresponding college course (Estación et al., 2011). Courses can be offered as face-to-face/online hybrid (i.e., blended learning) where students participate in lab activities through their high school courses, but complete assessments (e.g., tests and quizzes) online from the university instructor.

[1]The Eastern New Mexico University Institutional Review Board approved the study protocol and consent was obtained from all participants prior to their involvement in this study.

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Previous studies have shown that administrator support of dual enrollment is key to success of the program (Adelman, 2006; Farrace, 2008). In Michigan, state school administrators have worked with legislators to ease the road to college course attainment through dual enrollment (Cavanagh, 2011). In Colorado, administrator support for dual enrollment rose after community colleges started offering courses via distance through interactive video chat (Gertge, 2004). School leaders at rural schools have been quick to adopt dual enrollment courses, primarily because coordinating boards grade schools on dual credit participation (Andrews, 2001; Karp et al., 2007).

Based on previous research, student engagement in dual credit courses has been reported to enhance students' college readiness in reading and writing (Kim and Bragg, 2008), assist students in graduating college on time (Bailey et al., 2002), impact students' decisions of college majors (Morrison, 2008), and benefit underrepresented and underachieving students (Bailey et al., 2005). Also, dual enrollment programs have been reported to improve relationships between high schools and colleges, enhance K-12 efficiency, reduce college remediation (Krueger, 2006), and increase the academic momentum of students (Barnett and Hughes, 2010). Previous research indicated academic momentum to completion was an important factor in students' acquisition of college degrees (Adelman, 2006; Swanson, 2008).

Critics of dual enrollment warn about students enrolling in courses prior to being ready. Mead (2009) posited that students who were too young or not ready for the rigor of dual enrollment courses may become discouraged about college in the future. To address these concerns, previous literature recommended that dual enrollment programs must provide strong support systems for students (Barnett and Stamm, 2010), sequence dual enrollment courses appropriately (Karp, 2007), and model courses which prepare students for career success while maintaining academic rigor (Adelman, 2006).

Agriculture Dual Enrollment Program Model

The State of New Mexico School Grading Accountability system requires that all students must have taken at least one dual credit/dual enrollment course or Advanced Placement (AP) class to fulfill the requirements for graduation (New Mexico Public Education Department, 2013). Those classes that were dual credit must have been completed successfully with a grade of "C" or better. In the 2013-2014 school year, 79%, of students met this criterion. It was also found that 41% of the students limited themselves to only taking one college course during their high school career. Established relationships with school leaders, teachers, and students can lead to increased enrollment and success of students in dual enrollment programs. Offering more diversity in course selections in agriculture sciences will also help to recruit and retain students in this high need area (Bailey et al., 2005).

The strategic plan of this program relies on four specific goals for the overall program: access, accountability, affordability, and student success (Eastern New Mexico University Fact Book, 2015). These courses are offered at no cost to the school or student and are paid for by the state. School administrators, secondary teachers, and university faculty must agree on the courses offered and in what format they will be taught. A memo of understanding (MOU) is kept on file with the high school, college, and the state public education department. Teachers must be deemed qualified by the university faculty who most often require a minimum of a master's degree. Students must be at least a junior in classification and in good academic standing (minimum 2.5 GPA).

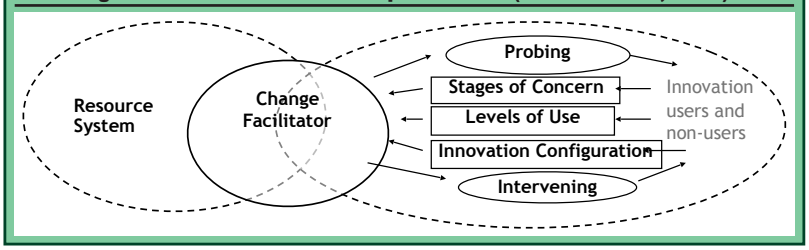
Currently Eastern New Mexico University offers six different agriculture dual enrollment courses. These courses include Introduction to Animal Science, Dairy Science, Introduction to Horticulture, Introduction to Metal Fabrication, Rural Buildings Construction, and Principles of Engines and Power Units. The 18 hours of dual enrollment courses offered all apply directly to majors in agricultural science. Courses are offered in three different formats: fully online through the university instructor, as a hybrid online/face-to-face model with the university faculty offering online content and the secondary teacher leading lab activities; and solely by the high school teacher serving as a university adjunct instructor. It has been found that programs with the hybrid course model have a high probability of success because instructors deliver the same rigorous college content while considering the pedagogical strategies that may be better for engaging secondary students (Picciano and Seaman, 2009).

To ensure program rigor, university faculty and secondary teachers work together to make sure students are performing their own work and put forth the required effort. Student assessments are developed by the university faculty and are completed online through the university blackboard system. This increases student accountability and upholds the high standards and rigor of the university. Even though, strengths and benefits of the program have been identified, areas that merit program improvement exist as well. The dual enrollment program, agricultural course offerings and how those courses are offered is continually changing and adapting to best serve the needs of the students, secondary schools, and the university. This research will assist program leaders in addressing these needs and making the necessary pedagogical, program and course content changes.

Conceptual Framework

This research was guided by the Concerns-Based Adoption Model (CBAM) (Hall and Hord, 2006), a conceptual framework which describes, explains and predicts probable educator concerns and behaviors throughout a change process (Figure 1).

Figure 1. Concerns Based Adoption Model (Hall and Hord, 2006)



The CBAM is built on the premise that change is a process, not an event, and as individuals navigate their way through the process they encounter not only a number of affective "stages of concern," but they also progress through different "levels of use" (Hall and Hord, 1987, 2006).

The CBAM is comprised of seven stages of concern (i.e., Awareness, Informational, Personal, Management, Consequence, Collaboration, and Refocusing) which educators encounter when adopting a program (Hall and Hord, 2006; Hogle et al., 1999). The earlier stages of concern address an individual's awareness and acquisition of knowledge about a given change; later stages of concern, the *"impact of the innovation on others in the organization, and methods for refining the innovation for greater benefits"* (Hogle et al., 1999, p 40).

Along with the stages of concern, the CBAM contains five levels of use (i.e., Nonuse, Orientation, Preparation, Mechanical, and Routine) which focus on educators' patterns of behavior when implementing an educational change (Hall and Hord, 1987, 2006). The levels of use range from Level 0, "Nonuse," a state in which there is little knowledge of the change and no plans for its implementation, to Level IV, "Routine," where the educator is comfortable with the change and is not planning to amend how it is used. Most administrators settle in at a "Routine" level of use. Some, however, may actively assess the impact of the innovation on their students and initiate changes in the innovation or their use of it on this basis.

The CBAM is helpful not only in understanding the change process, but in designing change strategies. An effective change strategy is one that helps teachers through the stages, addressing the seven concerns in sequence (Anderson, 1997). For example, skipping the stage of personal concern, or not giving teachers enough time to work through it makes successful change more difficult. Different concerns always interact and are operationalized by users at different points throughout the process.

The Concerns-Based Adoption Model (CBAM) describes the perceptions and motivations school leaders might have about a change in curriculum and/or instructional practices at different points in its implementation (Sweeny, 2003). In this research study, the CBAM was used to analyze the change process of administrators who supervised schools which implemented, or have students enrolling in the agriculture dual enrollment program. Moreover, this study focused on administrators' stages of concern, and levels of use components of that model.

Purpose/Objectives

Results from this study can contribute to a better understanding of the agriculture dual enrollment program secondary administrators, their opinions of course offerings, and the overall agriculture dual enrollment program. In the secondary setting, administrators generally serve as the opinion leader and act as a gatekeeper to the implementation of educational programs. Therefore, it is essential to understand administrators' perceptions of the agriculture dual-enrollment program to make needed changes to the format and delivery of the program. The purpose of this study was to develop an understanding of school administrators' perceptions of the New Mexico agriculture dual enrollment program's impact on the secondary school itself, and the students enrolled in the program. A total of four research objectives guided this study:

1. Determine administrators' perceptions of the impact of the agriculture dual enrollment program to areas of student success.
2. Evaluate administrators' perceptions of impact the agriculture dual enrollment program has on secondary agriculture educators.
3. Evaluate administrators' perceptions of how the agriculture dual enrollment program's presence on campus influences counselors.
4. Determine administrators' perceptions of the overall benefit of the agriculture dual enrollment program to the secondary school campuses.

Methods

This research employed a descriptive study with open ended questions. The target population for this study was all New Mexico administrators who supervised schools which were offering the agriculture dual enrollment courses on their campus (N=34). Of the 34 administrators in the target population, 24 participated in this study, yielding a response rate of 88%. A comparison of early to late responders was conducted to assess non- response error; no significant differences ($p<0.05$) were found.

Using a modified version of the Teacher Dual Enrollment Impact Survey (NACEP, 2011), administrators were asked to rank the impact of the dual enrollment course offerings on a five-point Likert type scale (1=strongly disagree to 5=strongly agree). The rating was on the dual credit course offering in relation to areas of student success, impact on the high school teacher, guidance counselor, and secondary school campus as a whole. Open-ended questions, regarding administrators' perceptions on the impact of dual enrollment programs (on students, teachers, and school as a whole), were presented after each Likert-type scale item. Open-ended responses were solicited to investigate program participants' experiences as this method allowed researchers to understand how people "make sense of their world" (VanMaanen, 1979). Hall and Hord (1987)

indicated researchers may use open-ended concerns statements to assess stages of concern.

Per National Alliance for Concurrent Enrollment Partnerships (NACEP) guidelines, none of the essential questions were deleted or modified other than specifying course focus (in this case agricultural science). The validity of this instrument has been established through testing and usage across the country (NACEP, 2011). The post-hoc reliability of the instrument resulted in a Cronbach's Alpha of 0.957.

Findings

Objective one: Determine administrators' perceptions of the impact of the agriculture dual enrollment program to areas of student success. Table 1 illustrates the administrators' perception of dual enrollment on student success.

Overall administrators had mixed feelings on the impact of agriculture dual enrollment on student success with an overall mean of 3.69 (SD=1.15). Administrators perceived the largest impact of the program on students' success regarding continuing rigorous learning into their senior year (M=3.88, SD=1.03), staying on campus to get college credit (M=3.86, SD=1.05), and gaining an in-depth knowledge of agriculture (M=3.83, SD=1.05). Participants were also asked the open-ended question, *"What is the single greatest impact agriculture dual enrollment courses have had on your students?"* They responded that involvement in the program led to more students getting involved in more rigorous courses, more students were attending college, they saw more momentum built towards interest in college, graduating more students, and gave high school agriculture students the opportunity to start college early. Several commented on the benefit of this program because they get free college credit. Selected administrator comments include:

"They learn better study habits and get a taste of what higher education will demand."

"It saves them time and money."

"This gives students the opportunity to determine whether they can be successful at the next level."

"Due to the availability of dual enrollment courses, our school has sent more graduated students in to post-secondary institutions."

Table 1. Administrators' Perceptions of the Agriculture Dual Enrollment Program to Student Success

Prompt	*M*	*Mode*	*SD*
Continued rigorous learning into their senior year	3.88	4	1.03
Chose to take courses on campus	3.86	5	1.46
Gained an in-depth knowledge of agriculture	3.83	4	1.05
Have enrolled in academically challenging courses	3.71	4	1.20
Developed effective time management skills	3.67	4	1.29
Developed an understanding of their academic skill	3.67	4	1.04
Gained an appreciation for the challenge of college	3.63	4	1.06
Developed effective study habits	3.58	4	1.06
Developed realistic college expectations	3.58	4	1.02
Considered, for the first time, going to college	3.38	3	1.31

Note: 1 = strongly disagree, 5 = strongly agree

Table 2. Perceived Benefits of the Agriculture Dual Enrollment Program to Secondary Teachers

Prompt	*M*	*Mode*	*SD*
Was supported by the dual university liaison	3.71	4	1.08
Increased critical thinking skills taught in courses	3.63	4	1.06
Developed better understanding of college expectations	3.63	4	1.06
Established higher standards for student work	3.50	4	1.06
Was more connected with their discipline	3.46	4	1.06
Found dual content useful in non-dual courses	3.46	4	0.93
Learned about new ideas in their discipline	3.42	4	1.02
Have been energized as a teacher	3.38	3	1.06
Found the job more satisfying	3.29	4	1.04
Learned new instructional strategies	3.25	3	1.26
Taken leadership positions within the school	3.00	3	0.98
Have been released from other school duties	2.89	3	0.93
Found it more difficult to fulfill other responsibilities	2.54	2	1.06

Note: 1 = strongly disagree, 5 = strongly agree

Objective two: Evaluate administrators' perceptions of impact the agriculture dual enrollment program has on secondary agriculture educators. Table 2 provides detail on these findings.

Findings indicated school administrators felt mostly neutral about the impact of an agriculture dual enrollment program on the agricultural science teachers, with a mean score of 3.32 (SD=1.05). The highest mean scores were found in the areas of positive relationships with university dual liaisons (M=3.71, SD=1.08), a visible increase of critical thinking taught by teachers (M=3.63, SD=1.06) and teachers having a better understanding of college expectations (M=3.63, SD=1.06). Administrators did not feel that the program took teachers away from other responsibilities, nor made it more difficult for them to do their job.

When asked, *"What is the single greatest impact dual enrollment has had on your teachers?"*, most administrators reported on teachers' willingness to increase course rigor. Some administrators also cited teachers' aligning courses to college expectations, a more positive attitude and developing working relationships with university faculty.

Objective three: Evaluate administrators' perceptions of how the agriculture dual enrollment program's presence on a campus influences counselors. Table 3 details how teachers recognized this program impacted school counselors' decisions.

Administrators were found to have a neutral perception of the impact dual enrollment had on school counselors. The highest mean scores were found within the area of how the school counselor "presents college options to students using dual enrollment" (M=3.79,

Table 3. Perceived Impact of the Dual Enrollment Program in Relation to School Counselors

Statement	*M*	*Mode*	*SD*
Changed the way they present college options to students	3.79	4	1.06
Perceived more students as capable of higher levels of academic achievement	3.50	4	1.02
Developed a better understanding of skills students need to succeed in college	3.46	4	1.06
Increased their knowledge of current college requirements	3.38	4	1.06
Enrolled more students in my agriculture science class	3.33	4	1.30

Note: 1 = strongly disagree, 5 = strongly agree

Table 4. Perceived Benefit of Agriculture Dual Enrollment to the Overall Secondary Campus

Prompt	*M*	*Mode*	*SD*
Progressed in meeting school goal of offering rigorous courses	4.00	4	1.06
Demonstrated to parents that their students are doing challenging work	3.88	4	1.04
Enhanced campus prestige and academic reputation	3.67	4	1.27
Offers perquisite courses for agriculture dual enrollment that are appropriate	3.63	4	1.06
Raised expectations for student performance	3.42	4	1.06

Note: 1 = strongly disagree, 5 = strongly agree

SD=1.06). Administrators did not feel that counselors enrolled more students in agriculture courses because of the dual enrollment program (M=3.33, SD=1.30).

Objective four: Determine administrators' perceptions of the overall benefit of the agriculture dual enrollment program to the secondary school campuses. These findings are presented within Table 4.

Overall administrators agreed dual enrollment brought rigorous courses to their campuses (M=4.00, SD=1.06) and demonstrated to stakeholders that students were performing well within challenging courses (M=3.88, SD=1.04). When answering the question, *"What is the single greatest impact the agricultural dual enrollment program has had on your school?"*, administrators felt that the dual enrollment program positively affected students having the chance to receive college courses for free, better prepared students for college success, increased university/secondary campus collaboration and the program has helped the school in meeting state dual credit requirements. Some opened answer responses include:

"Our students have an edge on their educational goals once reaching college."

"Students and teachers have access to courses that will provide a foundation of learning for a lifetime."

"Students are graduating at a higher percentage than other schools based on the large number of students being enrolled in dual credit courses."

"Has provided a taste of what students can expect once they get to college."

"Great program and very beneficial to our school and district."

"Allowed us to provide a wide variety of classes to our students regardless of our rural and small demographics."

The final question of the survey was an open response asking, *"What are some challenges that you have seen from your involvement with the agriculture dual enrollment program?"*. Some administrators felt that the school should get more credit on its state accountability grading because of dual enrollment participation. Some reflections from this statement include:

"While parents love it, some students may not be able to handle the rigor of these courses."

"The benefits of the program outweigh the challenges."

"Perhaps a few onsite courses as well as online courses?"

"We would like to see dual credit courses offered in our Navajo Language and focus on issues specifically facing our agriculture issues."

Conclusions

The researchers found that overall, administrators perceived the agriculture dual enrollment program had a positive impact on students, teachers, and the secondary campus. Specifically, administrators were mostly positive regarding the increased rigor of coursework and the depth of knowledge in agriculture topics as influenced by the inclusion of dual enrollment curriculum, which is similar to findings by Barnett and Hughes (2010). Like findings outlined by Young et al. (2014), administrators were positive regarding the opportunity for students to earn college credit without having to leave the high school campus, resulting in less travel time and decreased costs for transportation. Furthermore, administrators cited the opportunity to participate in college courses before high school graduation translated into more recent graduates enrolling in post-secondary education. An increase in critical thinking skills taught in courses as well as providing opportunities for students to develop a better understanding of college expectations were cited as positive impacts on the school as a whole, resultant of the changes implemented by the secondary teachers who taught the dual enrollment courses. This positive impact to the campus is a major component of change adoption within the CBAM (Hall and Hord, 2001). The administrator's comments backed up these findings as well as provided more detail on how the teachers were impacted in these areas.

Interestingly, administrators had more positive perceptions regarding the impact of dual enrollment courses in relation to school counselors than agricultural education teachers had been found to have. This difference could be attributed to the varying degrees of contact the administrators have with counselors versus the agricultural education teachers. Most notably, because of the opportunities provided by dual enrollment courses, the administrators perceived a change in how school counselors presented college options to students. As well, after having an opportunity to view how students responded to the challenging curriculum, the counselors were perceived to have higher expectations of the students who enrolled in the courses. Contrary to the perceptions of dual enrollment teachers regarding the impact of the program on school counselors, the beliefs of the administrators tended to fall into the mid-levels of use, informational and orientation, respectively. By addressing the mid-stages of concern related to informational and orientation, the researcher can successfully reach the later stages of collaboration. As the school counselors advance through the various stages outlined in the CBAM, they would eventually become adopters and advocates of the agriculture dual enrollment program.

Recommendations for Practice

Dual enrollment program directors are encouraged to develop and present a professional development workshop for school administrators to increase their level of understanding, which can be used as a stepping stone to increase the level of understanding and adoption of the school counselors of the agriculture dual enrollment program. This was important, as the level of counselors' support was the construct that had the lowest average scores perceived by administrators. Using the CBAM, counselors need to be better informed through appropriate professional development, which, from a leadership standpoint, may be best implemented by school administrators before they can advance further along the spectrums for levels of concern and levels of use. Being part of a larger study involving agriculture science teachers and school counselors, recommended practices will include how all these school officials can work collegially towards the improvement of the dual enrollment program. As noted within CBAM, an organization does not change until the individuals within it change (Hall and Hord, 2006). Additionally, it is recommended that professional development be provided to secondary educators that serve as "adjunct" faculty to the university. Researchers (Picciano and Seaman, 2009) suggested that dual enrollment courses offered from a hybrid model have a higher probability of success than do those offered strictly through the university, necessitating the need for training of those that serve in an adjunct capacity. Moreover, it is further recommended that an increase in training among secondary faculty would increase enrollment and concomitantly the success of those students enrolled in dual enrollment courses.

Recommendations for Research

The researchers will continue studying the barriers and influences of administrators' adoption of agriculture dual enrollment courses, guided by the CBAM. As this is a part of a larger study involving teachers and counselors, results should be further studied and compared. Research focused on the pedagogical approaches of course offerings both from university faculty and the secondary agricultural science teacher and administrators' perspectives would benefit the creation of higher quality dual enrollment courses. It is suggested that researchers continue studying the benefit of students' participation in the dual enrollment program on college entrance and success in higher education. More specifically, further research should focus on students' academic readiness for subsequent, advanced classes, after engaging in agriculture dual enrollment courses. Research should also be conducted regarding career paths of the high school students taking courses. After taking dual enrollment courses, does it influence their decision to major in agriculture? To develop a program that is available to a wide range of learners, while maintaining high standards for course accountability, more research should be performed on how well these programs address the needs of school leaders and communities. The researchers suggest further comparisons of the program perceptions of school administrators, counselors, teachers and students be completed, to additionally gauge their perceived levels of use and stages of concern regarding the agriculture dual enrollment program.

Literature Cited

Adelman, C. 2006. The toolbox revisited: Paths to degree completion from high school through college. Washington, DC: U.S. Department of Education. Office of Vocational Education.

Anderson, S.E. 1997. Understanding teacher change: Revisiting the concerns based adoption model. Curriculum Inquiry 27: 331-367.

Andrews, H.A. 2001. The dual credit phenomenon! Challenging secondary school students across 50 states. Stillwater, OK: New Forums Press.

Bailey, T.R., K.L. Hughes and M. Karp. 2002. What role can dual enrollment programs play in easing the transition between high school and postsecondary education? Washington, DC: Preparing for America's Future: The High School Symposium. Retrieved from ERIC database. (ED465090).

Bailey, T.R., K.L. Hughes and M. Karp. 2005. What role can dual enrollment programs play in easing the transition between high school and postsecondary education? Washington, DC: Office of Vocational and Adult Education, U.S. Department of Education (U.S. Department of Education Publication No. ED-99-CO-0160).

Balfanz, R. and N. Legters. 2004. Locating the dropout crisis: Which high schools produce the nation's dropouts? Where are they located? Who attends them? Report 70. Center for Research on the Education of Students Placed at Risk, CRESPAT. http://www.csos.jhu.edu/crespar/techReports/ Report70.pdf.

Barnett, E. and K. Hughes. 2010. Issue brief: Community college and high school partnerships. New York, NY: Community College Research Center. Columbia University. ERIC database. (ED512397).

Barnett, E. and L. Stamm. 2010. Dual enrollment: A strategy for educational advancement of all students. http://www.blackboardinstitute.com/pdf/Bbinstitute_DualEnrollment.pdf

Cavanagh, S. 2011. Public school choice pushed in Michigan. http://www.edweek.org/ew/toc/2011/09/21/index.html. Education Week 31(A): 1-2.

Estación, A., B.A. Cotner, S. D'Souza, C.S. Smith and K.M. Borman. 2011. Who enrolls in dual enrollment and other acceleration programs in Florida high schools? Issues & answers. REL 2012-No. 119. Regional Educational Laboratory Southeast. (ED526313).

Eastern New Mexico University. 2015. Fall 2015 fact book. Retrieved from Eastern New Mexico University website: https://my.enmu.edu/c/document_library/get_file?uuid=d140479f-dfe9-4f45-a8c2-d8d1e959

a7f0&groupId=2878891&filename=FactBook%20Electronic%202015.pdf.

Farrace, R. 2008. Double duty: A conversation with Pamela Drake and Scott Nielson. http://eric.ed.gov/?id=EJ789933. Principal Leadership 8(8): 22-26.

Gertge, P.A. 2004. Analyses of dual credit in rural eastern Colorado. PhD Diss., ProQuest Dissertation & Theses (3160092).

Goecker, A.D., P.G. Smith, E. Smith and R. Goetz. 2010. Employment opportunities for college graduates in food, renewable energy and their environment: United States. 2011-2015.

Hall, G.E. and S.M. Hord. 1987. Change in schools: Facilitating the process. Albany, NY: State University of New York Press.

Hall, G.E. and S.M. Hord. 2001. Implementing change: Patterns, principles, and potholes. Boston, MA: Allyn and Bacon.

Hall, G.E. and S.M. Hord. 2006. Implementing change: Patterns, principles, and potholes. Boston, MA: Allyn and Bacon.

Hogle, J.G., G.M. Pesti and J. King. 1999. Assessing the adoption of multimedia technology in a college of agriculture. http://www.jstor.org/stable/43765594?seq=1#page_scan_tab_contents NACTA Journal 43(4): 38-45.

Karp, M.M. 2007. Learning about the role of college student through dual enrollment participation. CCRC Working Paper No. 7. New York: Community College Research Center. Teachers College: Columbia University.

Karp, M.M., J.C. Calcagno, K.L. Hughes, D. Jeong and T.R. Bailey. 2007. The postsecondary achievement of participants in dual enrollment: An analysis of student outcomes in two states. Community College Research Center: Columbia University.

Kim, J. and D.D. Bragg. 2008. The impact of dual and articulated credit on college readiness and retention in four community colleges. Career and Technical Education Research 33(2): 133-158. DOI: 10.5328/CTER33.2.133.

Krueger, C. 2006. Dual enrollment: Policy issues confronting state policymakers. Policy Brief. Denver, CO: Education Commission of The States. ERIC database (ED493711).

Mead, R.A. 2009. A comparison of the enrollment and academic success of dual credit and non-dual credit students (unpublished doctoral dissertation). Iowa State University, Ames, IA.

Morrison, M.C. 2008. The benefits of acceleration-baccalaureate advantages. Mason City, IA: North Iowa Area Community College.

National Alliance of Concurrent Enrollment Partnerships. 2011. http://www.nacep.org/research-policy/legislation-policy/.

National Center for Public Policy and Higher Education and Southern Regional Education Board. 2010, June. Beyond the rhetoric: Improving college readiness by improving state policy. Washington, DC: Author. http://www.highereducation .org/reports college_readiness/CollegeReadiness.pdf.

National Student Clearinghouse, Research Center. 2017. Current term enrollment estimates: Spring 2017. https://nscresearchcenter.org/wp-content/uploads/Current TermEnrollment-Spring2017.pdf. National Student Clearinghouse

New Mexico Public Education Department. 2013. http://www.ped.state.newmexi co.us/dualcredit/.

Picciano, A.G. and J. Seaman. 2009. K–12 online learning: A 2008 follow-up of the survey of U.S. School District Administrators. Needham, MA: The Sloan Consortium.

Swanson, J. 2008. An analysis of the impact of high school dual enrollment course participation on post-secondary academic success, persistence and degree completion. Dissertation Abstracts International: Section A. Humanities and Social Sciences AAT 3323472.

Sweeny, B. 2003. CBAM: A model of the people development process. http://www.mentoring-association.org/membersonly/CBAM.html.

Van Maanen, J. 1979. Reclaiming qualitative methods for organizational research: A preface. Administrative Science Quarterly 24(4): 520-526. DOI: 10.2307/2392358.

Young, R.D., J.R. Slate, G.W. Moore and W. Barnes. 2014. Dual credit and non-dual credit college students: Differences in GPAs after the second semester. Http://jehdnet.com/journals/jehd/Vol_3_No_2_June_2014/11.pdf. Journal of Education and Human Development 3(2): 203-230.

Zeidenberg, M. and T. Bailey. 2009. Human resource development and career and technical education in American community colleges. Paper presented at the Asia-Pacific Economic Cooperation (APEC) Human Resources Development Group Meeting, Chicago, IL. Retrieved from ERIC database. (ED509712).

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Predictors of Freshman to Sophomore Retention in a College of Agricultural, Food and Life Sciences[1]

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Abstract

This study examined official university records for 3,257 new, first-semester freshmen entering the College of Agricultural, Food and Life Sciences (AFLS) between 1998 and 2015 to determine if selected student entry characteristics were related to sophomore retention. Two-thirds (67.0%) of freshmen students returned as AFLS majors in the fall of the following academic year. Students not returning to AFLS were almost equally divided between those not returning to the university (16.2%) and those returning to the university in non-AFLS majors (16.9%). Odds ratios (ORs) indicated every one-point increase in high school grade point average (HSGPA) was associated with a 245% increase in the likelihood of returning as an AFLS major, relative to dropping out. Being a first-generation college student increased the relative odds of dropping out by 66%. Agriculture majors (as contrasted to human environmental sciences majors) were 39% less likely to transfer out of AFLS, while students eligible for Pell grants were 28% less likely to transfer. Every one-point increase in composite ACT score was associated with a 6% increase in the likelihood of transferring out of AFLS. AFLS should increase retention efforts aimed at first-generation students, students with lower HSGPAs, human environmental sciences majors, and high ACT students.

Introduction

Nearly all agricultural, food, and natural resources (AFNR) industries are experiencing a shortage of qualified college graduates to fill available career opportunities (Goecker et al., 2015). Estimates through 2020 indicate colleges and universities will produce only 35,400 AFNR graduates each year to fill an estimated 57,900 annual positions (Goecker et al., 2015). The National Research Council (2009) and the STEM Food and Ag Council (2014), among others, have called for educational reform and strategic planning to meet AFNR employment needs.

The gap between the supply and demand for AFNR graduates is often thought of as a student recruitment issue (Rayfield et al., 2013), with significantly less attention given to the retention of currently enrolled AFNR students (Dunn et al., 2013). However, recruitment and retention efforts work in tandem to increase the supply of AFNR graduates by increasing the number of students entering the pipeline and by minimizing the loss of students as they move through the pipeline. Thus, increased attention must be devoted to AFNR student retention (Koon et al., 2009).

In addition to benefitting the AFNR industry, increased retention benefits students, universities, and society. College graduates enjoy increased income, more satisfying careers, and higher life satisfaction than their peers (Tinto, 2004). For individual universities, higher student retention positively impacts rankings, federal funding opportunities, alumni and public support, and program accreditation (Thammasiri et al., 2013). Finally, society benefits from higher retention and graduation rates through enhanced public discourse (Cantor, 2004), increased civic participation (Bradburn et al., 2006), and higher tax receipts (Day and Newburger, 2002).

Many universities employ somewhat selective admissions criteria to ensure that only those students with the potential to graduate are admitted (Wechsler, 2014). These criteria often include measures of academic performance such as high school grade point average (GPA), high school class rank, and ACT or SAT

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scores (Allen et al., 2008; Garton et al., 2002). However, other non-academic factors may also influence student retention (Garton et al., 2002; Vernon, 1996). Gender (Broecke and Nicholls, 2007; Leppel, 2002), socioeconomic status (Attewell et al., 2011; Quinn et al., 2005; Smith and Naylor, 2001; Yorke and Longdon, 2008), admission year (Garton et al., 2002), familial college experience (Mattern et al., 2015), and students' sense of belonging to an institution (Hausmann et al., 2007) have been reported as predictors of student retention. In addition, research has shown that receipt of need-based financial aid, specifically Pell Grants, is associated with higher graduation rates for students from families with limited financial resources (Singell, 2004; Wei et al., 2009).

While each of these factors has been identified as a contributor to retention, Mattern et al. (2015) stated, *"With so many student-level, institution-specific, and environmental variables influencing retention in unique and complex ways, it becomes difficult for colleges and universities to synthesize all research findings on the factors related to retention"* (p. 19). This complex phenomenon has led to university- and college-specific investigation of retention factors. Within colleges of agriculture, Garton et al. (2002) found high school core GPA and ACT score to be the best predictors of first-year academic performance at the University of Missouri. In a later study, they found the best predictors of retention varied by year; for 1997 freshmen, a combination of high school core GPA and ACT score was the best predictor; for 1998 freshmen, high school core GPA alone was the best predictor (Garton et al., 2002). Garton et al. (2002) recommended that additional research be conducted to *"establish valid and reliable predictors of student success in colleges of agriculture"* (p. 54). By identifying variables associated with attrition, university administrators can target at-risk students more effectively for retention and student success services (Harvey and Luckman, 2014). Increasing the percentage of freshmen returning as sophomores is a crucial component of an effective student retention program (Bingham and Solverson, 2016).

The purpose of this study was to determine if university admissions data could be used to predict freshman to sophomore retention in the College of Agricultural, Food and Life Sciences (AFLS) at the University of Arkansas. Specific objectives were to:

1. Determine the sophomore retention status of first-time freshman admitted to AFLS between 1998 and 2015;
2. Determine if selected variables (admission year, high school GPA, composite ACT score, gender, major, Pell Grant eligibility, and first-generation college student status) were significantly ($p<0.05$) related to sophomore retention status of first-time freshmen admitted to AFLS between 1998 and 2015.

Methods

The population for this study included all AFLS students enrolling as new, full-time, first-semester freshmen (N=3,601) from 1998 to 2015. This specific population was studied because they are the students on which official institutional retention and graduation rates are based (DeAngelo et al., 2011).

After institutional IRB approval, the Office of Institutional Research (OIR) provided the researchers with admissions data for each student: year admitted, high school GPA, composite ACT score (major, categorized as human environmental sciences or agriculture), Pell grant eligibility (yes or no), and first-generation college student status (yes or no). The OIR also supplied matched data for each student's sophomore enrollment status (enrolled or not enrolled) and the current college for enrolled students. Sophomore enrollment data was used to classify each student into one of three mutually exclusive University of Arkansas retention categories: (a) not enrolled (Non-Returners), (b) enrolled in a different college (Non-AFLS Returners); and (c) enrolled in AFLS (AFLS-Returners). Complete data were available for 3,257 (90.4%) students. Because the data set consisted of official university records supplied by the OIR, the data was deemed valid and reliable.

Descriptive statistics, multinomial logistic regression, and marginal effects were used to analyze the data. According to Peng et al. (2002), *"logistic regression is well suited for describing and testing hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables"* (p. 4). Multinomial logistic regression consists of k -1 comparisons, where k is the number of categories, and each comparison is made in relation to a specified baseline category (Stokes et al., 2012). In this study, there were three retention categories (Non-Returners, Non-AFLS Returners, and AFLS-Returners) and, since our objective was to determine differences between AFLS-Returners and the other two groups, AFLS-Returners was specified as the baseline category. Thus, two comparisons (Non-Returners to AFLS-Returners and Non-AFLS Returners to AFLS-Returners) were made. For each model, logistic regression coefficients and odd ratios (ORs) compare Non-Returners or Non-AFLS Returners to AFLS-Returners. Marginal effects were also computed and analyzed to examine relationships across all three retention categories.

Multinomial logit models assume the independence of irrelevant alternatives (IIA); this assumption was tested using appropriate Hausman-McFadden (1984) tests. Of the three tests, one did not reject the IIA (at $p<0.05$) and the other two gave negative chi-square values. For negative values of the test statistics, Hausman and McFadden present an argument for not rejecting the null hypothesis although there is some dissent on the usefulness of this test statistic (Cheng and Long, 2007). Thus, based on the test results and the belief there were no close substitutes among the three alternatives, the researchers concluded use of multinomial logis-

tic regression was appropriate. Additional assumptions (Peng et al., 2002) related to independence of observations and sample size to predictor ratio were met.

Results

Between 1998 and 2015, 3,601 full-time, first time, first-semester freshmen enrolled in AFLS at the University of Arkansas. Nearly two-thirds (63.7%) of AFLS freshmen majored in agriculture while slightly over one-third (36.3%) majored in human environmental sciences. Females constituted most freshmen in both agriculture (52.4%) and in human environmental sciences (94.9%). Less than one-quarter of freshmen were first-generation college students (23.6%) or eligible for Pell Grants (21.4%). These freshmen had a mean high school grade point average of 3.54 (SD=0.43) and a mean composite ACT score of 24.54 (SD=3.60).

Correlation coefficients were calculated to examine the relationship between each of the demographic variables and year of college entry (1998 to 2015) to determine if students could be grouped across years for multinomial logistic regression. The results indicated significant but negligible to low (Davis, 1973) positive correlations between year and ACT score (r=0.05; r^2=0.0025), major (r_b=-0.07; r^2=0.0049), and status as a first-generation college student (r_b=0.15; r^2= 0.0225). The r^2 values indicated the variance explained by year ranged from 0.25% (for ACT score) to 2.25% (for first-generation status). Based on these results, students were grouped across years; however, year was retained as a potential predictor in subsequent analyses.

Overall, two-thirds (67.0%) of freshmen students were AFLS-Returners in the fall of the following academic year (AFLS-Returners). Students not returning to AFLS were almost equally divided between Non-Returners (16.2%) and Non-AFLS Returners (16.9%). Non-AFLS Returners switched to majors in arts and sciences (42.2%), education and health professions (27.0%), business (18.1%), engineering (9.1%), and architecture (3.6%).

Mean composite ACT scores were significantly ($p<0.05$) different for all three groups, being lowest for Non-Returners (M=23.28, SD=3.09), intermediate for AFLS-Returners (M=24.67, SD=3.56), and highest for Non-AFLS Returners (M=25.25, SD=3.93). Similarly, Non-Returners (M=3.33, SD=0.43) had a significantly lower ($P<0.05$) mean HSGPA than AFLS-Returners (M=3.57, SD=0.41) or Non-AFLS Returners (M=3.62, SD=0.42). Majorities of students within each retention group were female, majored in agriculture, and were not first-generation college students or eligible for Pell grants (Table 1).

Logistic Regression Models

The global test of the null hypothesis that no model coefficients were significantly different from zero was rejected, $\chi^2(12)=221.86$, $p<0.001$, pseudo-R^2=0.08. Although classification was not the primary objective of this study, the models were evaluated in terms of their accuracy and, while the models improved prediction relative to random assignment (e.g. 67.0% vs. 33.3%, respectively), they categorized virtually all (99.4%) students as AFLS-Returners. Frost (2013) asserted researchers can still *"draw important conclusions about how changes in the [individual] predictor variables are associated with changes in the response variable"* even when overall model classification is weak. Peng et al. (2012) and Silvestri et al. (2013) also supported this assertion.

Table 1. Frequencies and Percentages for Demographic Variables by Retention Status

	Retention Status					
	Non-Returner		Non-AFLS Returner		AFLS-Returner	
Variable	*f*	%	*f*	%	*f*	%
Gender						
Female	388	66.4	432	71.2	1622	67.3
Male	195	33.4	175	28.8	789	32.7
Major						
Human Environmental Sciences	201	35.5	271	44.6	832	34.6
Agriculture	382	65.5	336	55.4	1577	65.4
First-Generation						
No	333	64.5	466	82.9	1712	77.5
Yes	183	35.5	96	17.1	497	22.5
Pell-Eligible						
No	404	69.3	513	84.5	1913	79.3
Yes	179	30.7	94	15.5	498	20.7

Model One: Non-Returners vs. AFLS-Returners

The first model contrasted Non-Returners with AFLS-Returners. In interpreting the regression coefficients and odds ratios (*ORs*), positive coefficients and *ORs*>1.0 indicate an increase in the predictor is associated with an increased likelihood a student will be classified as a Non-Returner; negative coefficients and *ORs*<1.0 indicate an increase in the predictor is associated with a decreased relative likelihood a student will be classified as a Non-Returner.

Two variables significantly differentiated between Non-Returners and AFLS-Returners: HSGPA and First Generation college student status (Table 2). No other variables had a regression coefficient significantly ($p<0.05$) different from zero. Of particular interest, the regression coefficient (0.00) for Year was not statistically significant, indicating Year did not affect the likelihood of being a Non-Returner relative to an AFLS-Returner when holding all other predictors constant.

Table 2. Results of Multinomial Logistic Regression Modeling Non-Returners Compared to AFLS-Returners

		Odds Ratio with 95% *CI*		
	B (*SE*)[1]	Lower	Odds Ratio	Upper
Intercept	3.06 (0.47)***			
Year	0.00 (0.01)	0.98	1.01	1.02
ACT	-0.02 (0.02)	0.95	0.98	1.02
HSGPA	-1.23 (0.15)***	0.22	0.29	0.39
Gender[z]	-0.22 (0.12)	0.63	0.81	1.03
Major[y]	0.00 (0.12)	0.79	1.00	1.26
Pell Eligible[x]	0.15 (0.12)	0.91	1.17	1.49
First Generation[x]	0.50 (0.12)***	1.31	1.66	2.08

[1]NS, *, **, *** Nonsignificant or significant at P < 0.05, 0.01, or 0.001

[z]Coded 0 = Human Environmental Sciences and 1 = Agriculture

[y]Coded 0 = female and 1 = male

[x]Coded 0 = no and 1 = yes

The negative regression coefficient (-1.23) for HSGPA indicated students with higher HSGPAs were less likely to be Non-Returners in the sophomore year as compared to AFLS-Returners. The *OR* of 0.29 indicated that each one unit increase in HSGPA was associated with a 71% [(1-*OR*) x 100] decrease in the odds a student would be a Non-Returner relative to AFLS-Returners when all other variables in the model were held constant. Stated positively, a one-unit increase in HSGPA resulted in a 245% increase in the odds a student would be an AFLS-Returner as compared to a Non-Returner.

The positive regression coefficient (0.50) for First Generation indicated first generation college students were more likely to be Non-Returners for the sophomore year as compared to AFLS-Returners. The *OR* of 1.66 indicated being a first-generation college student was associated with a 66% increase in the odds of being a Non-Returner relative to AFLS-Returners, with all other predictors held constant.

Model Two: Non-AFLS Returners vs. AFLS-Returners

The second model contrasted Non-AFLS Returners with AFLS-Returners. Thus, positive coefficients and *ORs*>1.0, indicate an increase in the predictor was associated with an increased likelihood a student will be a Non-AFLS Returner; negative coefficients and *ORs*<1.0 indicate an increase in the predictor was associated with a decreased likelihood the student will be a Non-AFLS Returner.

Three variables significantly differentiated between Non-AFLS Returners and AFLS-Returners: composite ACT score, Major, and Pell grant eligibility. No other potential predictor, including Year, had a regression coefficient significantly ($p<0.05$) different from zero (Table 3).

The negative regression coefficients for Major (-0.50) and Pell (-0.33) indicated agriculture majors and Pell grant-eligible students were less likely to be Non-AFLS Returners (relative to AFLS-Returners) than were human environmental sciences majors and non-Pell-eligible students. The odds ratios indicated being an agriculture major was associated with a 39% decrease in the comparative odds a student would be a Non-AFLS Returner; being Pell-eligible was associated with a 28% decrease in the relative odds a student would be a Non-AFLS Returner.

The positive regression coefficient (0.05) for ACT indicated students with higher ACT scores were more likely to be Non-AFLS Returners as compared to AFLS-Returners. The OR of 1.06 indicated every one-unit increase in ACT score was associated with a 6% increase in the relative odds a student would be a Non-AFLS Returner.

Marginal Effects

To further explore the relationship between the predictors and freshman-to-sophomore retention outcomes, NLOGIT 5 (Econometric Software, Inc., 2012) was used to calculate marginal effects across all three retention outcomes for all predictors. A marginal effect is the change in probability of a specific retention outcome associated with a one-unit increase in the predictor, holding all other predictors at their mean values (Wulff, 2015). Thus, a marginal effect is the effect of a one-unit increase in a specific predictor on the average or typical subject. Across retention outcomes, the sum of the marginal effects for any predictor will be zero because students who are less likely to be represented in one retention outcome are equally more likely to be represented in one or both of the other retention outcomes.

When controlling for all other predictors, HSGPA had the largest overall marginal effect on retention status (Table 4). A one-unit increase in HSGPA significantly increased the probability of being an AFLS-Returner (0.116), decreased the probability of being a Non-Returner (-0.147), and (although not statistically significant) suggested an increased probability of being a Non-AFLS Returner (0.031). A one-unit increase in ACT score was associated with a statistically significant increase of 0.008 in the probability of being a Non-AFLS Returner and, although not statistically significant, a decrease in the probability of being an AFLS-Returner (-0.005) or a Non-Returner (-0.003). In the context of retention in AFLS, these results indicated a slight tendency to lose higher ACT score students and retain higher HSGPA students, with all other predictors held constant.

Table 3. Results of Multinomial Logistic Regression Modeling Non-AFLS Returners Compared to AFLS-Returners

		Odds Ratio with 95% *CI*		
	B (SE)[1]	Lower	Odds Ratio	Upper
Intercept	-2.23 (0.47)***			
Year	-0.15 (0.01)NS	0.97	0.99	1.00
ACT	0.05 (0.02)**	1.02	1.06	1.09
HSGPA	0.02 (0.15)NS	0.76	1.02	1.36
Gender[z]	-0.22 (0.12)NS	0.82	1.04	1.32
Major[y]	-0.50 (0.11)***	0.49	0.61	0.76
Pell Eligible[x]	-0.33 (0.14)*	0.55	0.72	0.95
First Generation[x]	-0.18 (0.13)NS	0.65	0.83	1.08

[1]NS, *, **, *** Nonsignificant or significant at P < 0.05, 0.01, or 0.001

[z]Coded 0 = Human Environmental Sciences and 1 = Agriculture

[y]Coded 0 = female and 1 = male

[x]Coded 0 = no and 1 = yes

Table 4. Marginal Effects on Retention Outcome of a One Unit Increase in Each Predictor, Holding all other Predictors at their Mean Values

	Retention Outcome					
	Non-Returner		Non-AFLS Returner		AFLS-Returner	
Predictor	Marginal effect	z[1]	Marginal effect	z[1]	Marginal effect	z[1]
Year	0.001	0.42NS	-0.002	-1.61NS	0.002	0.98NS
ACT	-0.003	-1.47NS	0.008	3.41***	-0.005	-1.63NS
HSGPA	-0.147	-8.83***	0.031	1.52NS	0.116	4.83***
Major[z]	0.011	0.79NS	-0.069	-4.49***	0.058	3.07**
Gender[y]	-0.026	-1.82NS	0.010	0.62NS	0.016	0.82NS
Pell Eligible[x]	0.026	1.77NS	-0.049	-2.54*	0.023	1.05NS
First-Generation[x]	0.065	4.71***	-0.037	-2.09*	-0.027	-1.34NS

Note. Marginal effects across each predictor may not sum to zero due to rounding.

[1]NS, *, **, *** Nonsignificant or significant at P < 0.05, 0.01, or 0.001

[z]Coded 0 = Human Environmental Sciences and 1 = Agriculture

[y]Coded 0 = female and 1 = male

[x]Coded 0 = no and 1 = yes

Being an agriculture major significantly decreased the probability of being a Non-AFLS Returner (-0.069), increased the probability of being an AFLS-Returner (0.058), and again, while not statistically significant, suggested an increased probability of being a Non-Returner (0.011). Pell-eligible students had a significantly lower probability of being a Non-AFLS Returner (-0.049) and higher (although not statistically significant) probabilities of being AFLS-Returners (0.023) or Non-Returners (0.026). Being a First-Generation college student significantly increased the probability of being a Non-Returner (0.65) and (although not statistically significant) decreased the probability of being either a Non-AFLS Returner (-0.037) or an AFLS-Returner (-0.027). Neither Year nor Gender had a significant marginal effect on the probability of any retention outcome for the average student.

The results based on the marginal effects were consistent with the logistic regression models. In both analyses, increases in HSGPA, being an agriculture major, and being Pell-eligible were associated with an increased probability of being an AFLS-Returner. Likewise, increases in ACT score and being a First-Generation college student were associated with a decreased probability of being an AFLS-Returner.

Summary

This study sought to determine if university admissions data could be used to predict freshman to sophomore retention in the College of Agricultural, Food and Life Sciences. Using data obtained from the University of Arkansas Office of Institutional Research it was determined that nearly two-thirds of the freshmen enrolled in AFLS between 1998 and 2015 majored in agriculture. Most freshmen in both agriculture and in human environmental sciences were female. However, this study noted no statistically significant association between gender or admission year as a predictor of retention, which does not support previous research by Broecke and Nicholls (2007), Leppel (2002), or Garton et al. (2002).

Most freshmen students returned to the University of Arkansas as AFLS majors in the fall of the following academic year (AFLS-Returners). Thirty-three percent of students were Non-Returners and were almost evenly divided between those not returning to the university and those returning to the university in non-AFLS majors. Model one of this study contrasted Non-Returners with AFLS-Returners. Two variables were identified as significantly differentiating between Non-Returners and AFLS-Returners: HSGPA and First Generation college student status. Students with higher HSGPAs were less likely to be Non-Returners in the sophomore year as compared to AFLS-Returners. The magnitude of this predictive factor was large - a one-unit increase in HSGPA resulted in a 245% increase in the relative odds a student would be an AFLS-Returner as compared to a Non-Returner. First generation college students were 66% more likely to be Non-Returners for the sophomore year as compared to AFLS-Returners. This is concerning because 23.6% of incoming AFLS freshman were first generation college students. Retention programs specifically targeted at First Generation college students are needed and should be a priority for AFLS.

Model two contrasted Non-AFLS Returners with AFLS-Returners. Three variables significantly differentiated between Non-AFLS Returners and AFLS-Returners: composite ACT score, Major, and Pell grant eligibility. Each one-point increase in ACT score was associated with a 6% increase in the relative likelihood a student would be a Non-AFLS Returners. Thus, students with higher ACT scores had an increased likelihood of switching to a non-AFLS major by their sophomore year. This research does not support Garton et al. (2002) who found both high school GPA and ACT scores to be the best predictors of student retention for college of agriculture students at the University of Missouri.

Agriculture majors were 39% less likely to be Non-AFLS Returners as compared to human environmental sciences majors. Although the specific reason students entering in agriculture majors tended to remain in AFLS could not be determined from the data, the authors posit this may be a result of these students' background experiences and self-identity with agriculture, farming, and rural life (Shoulders and Myers, 2011). Future research should explore this hypothesis, possibly through use of focus group techniques with agriculture majors.

Pell grant-eligible students were less likely (28% decrease) to be Non-AFLS Returners (relative to AFLS-Returners) than were non-Pell-eligible students. Previous research (Singell, 2004; Wei et al., 2009) indicated lower income students receiving Pell grants were more likely to persist than similar students not receiving Pell Grants; however, no studies suggested Pell-eligible students were less likely to change majors than non-Pell-eligible students. Thus, further research to better understand this finding is recommended.

When analyzing marginal effects across retention outcomes, HSGPA had the largest overall effect on retention status. The higher the HSGPA the more likely the student would be retained in AFLS for the sophomore year. Results indicated a tendency to lose higher ACT score students and retain higher HSGPA students. Therefore, recruitment strategies at University of Arkansas for the College of Agricultural, Food and Life Sciences may need to focus on higher HSGPA students versus higher ACT scores.

Additionally, agriculture majors were less likely to be Non-AFLS Returners and more likely to be AFLS-Returners. Additional research in this area should be conducted to determine if major selection and major commitment are related. Lastly, Pell-eligible students were more likely to return their second year as AFLS students, while First-Generation college students were less likely to return to the university as sophomores. Further study is needed to better understand the relationship between Pell-eligibility and AFLS retention. The finding of increased attrition of First-Generation students

is consistent with previous research (Mattern et al., 2015); given that nearly one-in-four AFLS freshmen is a First-Generation student, addressing this issue should be a priority for AFLS faculty, staff, and administrators.

Although recruitment is challenging for Colleges of Agricultural, Food and Life Sciences, retention remains the area of focus and need for many universities especially through developing and refining prediction models (Harvey and Luckman, 2014; Thammasiri et al., 2013). This comprehensive look at one college of agriculture is a first step in more deeply understanding retention issues and identifying areas of future focus. Additional research is needed to establish additional valid and reliable predictors of student success in colleges of agriculture.

Literature Cited

Allen, J., S.B. Robbins, A. Casillas and I.S. Oh. 2008. Third-year college retention and transfer: Effects of academic performance, motivation, and social connectedness. Research in Higher Education 49: 647-664.

Attewell, P., S. Heil and L. Reisel. 2011. Competing explanations of undergraduate noncompletion. American Educational Research Journal 48: 536-559.

Bingham, M.A. and N.W. Solverson. Using enrollment data to predict retention rate. Journal of Student Affairs Research and Practice 53(1): 51-64.

Bradburn, E.M., S. Nevill and E.F. Cataldi. 2006. Where are they now? A description of 1992-1993 bachelor's degree recipients 10 years later. NCES 2007-1959. Washington, DC: Institute of Educational Sciences. National Center for Educational Statistics.

Broecke, S. and T. Nicholls. 2007. Ethnicity and degree attainment. Department for Education and Skills Research Report RW92. United Kingdom.

Cantor, N. 2004. Civic engagement: The university as a public good. Liberal Education 90(2): 18-25.

Cheng, S. and S. Long. 2007. Testing for IIA in the multinomial logit model. Sociological Methods and Research 35(4): 583-600.

Davis, J.A. 1973. Elementary survey analysis. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Day, J.C. and E.C. Newberger. 2002. The big payoff: Educational attainment and synthetic estimates of work-life earnings. Washington, DC: U.S. Census Bureau.

DeAngelo, L., R. Franke, S. Hurtado, J.H. Pryor and S. Tran. 2011. Completing college: Assessing graduation rates at four-year institutions. Los Angeles: Higher Education Research Institute, UCLA.

Dunn, J.R., B.J. Hains and R.B. Epps. 2013. Stakeholder's perspectives: Students' perceptions of retention efforts in a college of agriculture. NACTA Journal 57(1): 2-9.

Econometric Software, Inc. 2012. NLOGIT. http://www.limdep.com/products/ July 13, 2017.

Frost, J. 2013. Regression analysis: How do I interpret R-squared and assess the goodness-of-fit http://blog.minitab.com/blog/adventures-in-statistics-2/regression-analysis-how-do-i-interpret-r-squared-and-assess-the-goodness-of-fit.

Garton B.L., A.L. Ball and J.E. Dyer. 2002. The academic performance and retention of college agriculture students. Journal of Agricultural Education 43(1): 46-56.

Goecker, A.D., E. Smith, J.M. Fernandez, R. Ali and R. Goetz. 2015. Employment opportunities for college graduates in food, agriculture, renewable natural resources, and the environment: United States. 2015–2020. https://www.purdue.edu/usda/employment/ July 13, 2017.

Harvey, A. and M. Luckman. 2014. Beyond demographics: Predicting student attrition within the Bachelor of Arts degree. International Journal of the First Year in Higher Education 5: 19-29.

Hausman, J.A. and D. McFadden. 1984. Specification tests for the multinomial logit model. Econometrica 52(5): 1219-1240.

Koon, L.A., M.J. Frick and C.G. Igo. 2009. What kind of students are enrolling in a college of agriculture and are they staying: A mixed methods approach. NACTA Journal 54(2): 21-28.

Leppel, K. 2002. Similarities and differences in the college persistence of men and women. The Review of Higher Education 4: 433-450.

Mattern, K.D., J.P. Marini and E.J. Shaw. 2015. Identification of multiple nonreturner profiles to inform the development of targeted college retention interventions. Journal of College Student Retention 17: 18-43.

National Research Council. 2009. Transforming agricultural education for a changing world. Washington, DC: The National Academies Press.

Peng, C.-Y.J., K.L. Lee and G.M. Ingersoll. 2002. An introduction to logistic regression analysis and reporting. The Journal of Educational Research 96(1): 3-14.

Quinn, J., L. Thomas, K. Slack, L. Casey, W. Thexton and J. Noble. 2005. From life crisis to lifelong learning: Rethinking working class dropout from higher education. York, UK: Joseph Rowntree Foundation.

Rayfield, J., T.P. Murphrey, C. Skaggs and J. Shafer. 2013. Factors that influence student decisions to enroll in a college of agriculture and life sciences. NACTA Journal 57(1): 88-93.

Shoulders, C.W. and B.E. Myers. 2011. Considering professional identity to enhance agriculture teacher development. Journal of Agricultural Education 52(4): 98-108. DOI: 10.5032/jae.2011.04098.

Silvestri, L.A., M.C. Clark and S.A. Moonie. 2013. Using logistic regression to investigate self-efficacy and the predictors for National Council Licensure Examination success for baccalaureate nursing students. Journal of Nursing Education and Practice 3(6): 21-34. DOI: 10.5430/jnep.v3n6p21.

Singell, Jr., L.D. 2004. Come and stay a while: Does financial aid effect retention conditioned on enrollment at a large public university? Economics of Education Review 23: 459-471.

Smith, J. and R. Naylor. 2001. Dropping out of the university: A statistical analysis of the probability of withdraw for UK university students. Journal of the Royal Statistical Society: Series A 164: 389-405. DOI: 10.1111/1467-985X.00209.

STEM Food and Ag Council. 2014. Annual Report. https://www.agripulse.com/ext/resources/pdfs/s/t/e/r/t/STEM_Food_Ag_Council_Report.pdf. July 14, 2017.

Stokes, M.E., C.S. Davis and G.G. Koch. 2012. Categorical data analysis using SAS®. Cary NC: SAS Institute, Inc.

Thammasiri D., D. Delen, P. Meesad and N. Kasap. 2013. A critical assessment of imbalanced class distribution problem: The case of predicting freshmen student attrition. Expert Systems with Application 41(2): 321-330. DOI: 10.1016/j.eswa.2013.07.046.

Tinto, V. 2004. Student retention and graduation: Facing the truth, living with the consequences. Washington, DC: The Pell Institute for the Study of Opportunity in Higher Education. Occasional Paper No. 1.

Vernon, J.R. 1996. The role of judgement in admissions. Unpublished doctoral dissertation. RAND Graduate School of Policy Studies. Santa Monica, CA.

Wechsler, H.S. 2014. The qualified student: A history of selective college admission in America. New Brunswick, NJ: Transaction Publishers.

Wei, C.C., L. Horn and T. Weko. 2009. A profile of successful Pell grant recipients: Time to bachelor's degree and early graduate school enrollment. https://nces.ed.gov/pubs2009/2009156.pdf. Washington, DC: U.S. Department of Education, National Center for Educational Statistics. July 14, 2017.

Wulff, J.N. 2015. Interpreting results from the multinomial logit model: Demonstrated by foreign market entry. Organizational Research Methods 18(2): 300-325.

Yorke, M. and B. Longden. 2008. The first-year experience of higher education in the UK – Final report. York, UK: Higher Education Academy.

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Student Perceptions of Blogs as Teaching Tool in a Soil Science Course

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Abstract

Writing assignments are staple teaching tools in many courses. However, most writing assignments, like term papers, allow students to learn only about one topic – the topic they wrote about. A writing assignment that promotes learning about many topics is more beneficial. A blog assignment was used as substitute to a term paper requirement in a soil science course. Pairs of students were assigned a topic and given instructions to prepare a blog with scientific content but written in conversational manner within an 850-word limit. After review by the instructor, the blogs were posted in a blogsite for everyone in the class to read and study. All students agreed that writing blogs was a good way to learn a new topic and reading the blogs of others offered additional opportunities for learning. Eighty-five percent of the students prefer writing blogs over writing term papers. In addition, 62% of students disagreed that writing a full-length term paper would have offered more learning than writing a blog. Students mentioned that the biggest challenge with the assignment was keeping it below the word limit. Results indicate that blogs are effective teaching tools and viable alternatives to full-length term papers as a writing assignment.

Introduction

Instructors use a variety of teaching tools to promote student interest and involvement, accommodate various learning preferences, and re-emphasize key points in a course. Reading and writing assignments, class presentations, hands-on and outdoor activities, tutorial sessions, and class discussions, among others, are common teaching tools used by teachers. Improvement in internet access in recent years has given teachers another set of teaching tools at their disposal.

The use of online discussion boards and utilization of various social media platforms has gained popularity across various academic levels and fields of study. Online teaching tools are used in teacher education courses (King, 2002), in the medical field (Ruiz et al., 2006), in engineering (Bourne et al., 2005), and agriculture (Bigelow and Kaminski, 2016). In fact, Settle et al. (2011) reported that majority (61%) of instructors in the College of Agriculture used social media in their classes. Apart from the convenience that they provide, the following are other advantages of online and social media platforms: help increase the quality and efficiency of communication between students and the instructor, improve access to class information, ease of collaboration, and stronger social connections between classmates (Odom et al., 2013).

Among the online teaching tools that have gained popularity is the use of blogs. Blogs are online discussion or informational sites, normally managed by an individual or a small group, consisting of discrete entries called “posts” and typically written in a simplified conversational style to appeal to a wider online audience. The use of blogs as a teaching, outreach, and social tool has been increasingly recognized and assessed in scientific circles. A simple subject search of the word “blog” in ScienceDirect.com (which has access to over 2,500 journals and 33,000 book titles) yielded only 60 articles in 1990 but has increased to 1,175 articles in 2009 and peaked at 3,412 articles in 2016. Previous studies have reported positive student experience with blog-supported learning environments (Ducate and Lumicka, 2008; Halic et al., 2010; Top, 2012) and that blogs were even considered as “thinking device” that enhanced professional development (Fisher and Kim, 2013). As a teaching tool, blogs have been used in teacher education (Okan and Taraf, 2013; Williams and Jacobs, 2004), architecture (Bâldeae et al., 2015), and even in turf science (Baldwin et al., 2015). Blog-based class exercises have even been shown to improve the structure and quality of argumentation of students in a critical writing course (Kathpalia and See, 2016). Blogs have also been used as a method of documenting and reporting student experience during study-abroad trips (Elola and Oskoz, 2008; Lee, 2012) and internships (Chu et al., 2012a; Chu et al., 2012b).

This paper articulates the method of managing a blog assignment and presents the results of a survey designed to determine student perception about this

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alternative teaching tool. This study aimed to evaluate the use of blogs as a teaching tool and as an assignment that can potentially replace a full-length term paper. The idea was to have an assignment wherein students would conduct literature research to achieve extensive and deep understanding about a given topic – enough for them to identify and discuss key points that they could write in a simplified and conversational manner for their peers to learn from. The exercise also doubled-up as a writing exercise where the instructor assisted in preparing the topical outline, reviewed the grammar and flow of thought, and made suggestions to improve the final manuscript. Finally, by sharing all the blogs to the entire class, this exercise was meant to expand the learning benefit to all students.

Methods

Topic Assignments

The blog assignment was implemented in the Environmental Soil Science course. The assignment was done in pairs. Students could choose their partner in the second week of the semester. Each pair was randomly assigned a topic from a list prepared by the instructor. All blog topics are related to at least one chapter in the course and they came with designated draft due dates and blog posting dates. The assigned topics include the history and remediation of super-fund sites, fates of various pollutants in the soil, and the impacts of large-scale projects like the Three Gorges Dam, among others.

Development of the Blog

Students were instructed to conduct a preliminary research about their respective topics and to schedule a 10-minute meeting (for each pair) with the instructor to discuss possible contents of the blog. At the end of the meeting, the students and instructor agreed on a blog outline that includes a list of five key points that will be discussed in the blog. The students were then given a copy of the rubric that specifies an 850-word limit and a maximum of five figures or tables. The students were also provided with a link to a sample of a well-written and properly formatted blog for their reference.

Students were given five weeks to develop the first draft of their respective blogs. The instructor then reviewed the drafts, double-checked the references listed, and returned the corrected manuscripts to the students along with suggestions for improvement. Students must re-submit the improved draft of the blog one week prior to the scheduled posting date. In some cases, the instructor had to return the improved draft back to the students for one more round of edits and refinement.

Blog Posting and Quizzes

Online posting of the blogs was done by the instructor. Three blogs were posted each week. The blogs were posted in a college-hosted course blogsite. The authors were provided with the online link to the newly posted blog for their final review before the link was shared to the rest of the class.

Table 1. The survey instrument used in gathering data

Statements	Possible answers
Writing blogs was a good way to learn a new topic and write about it in a conversational manner.	Agree, Strongly Agree, Disagree, Strongly Disagree
Reading the blogs of other students offered opportunities for me to learn new, interesting subjects.	Agree, Strongly Agree, Disagree, Strongly Disagree
I believe that I could have learned more about a topic if I wrote a full-length term paper instead of writing a blog.	Agree, Strongly Agree, Disagree, Strongly Disagree
I prefer writing blogs than writing term papers as a course writing assignment.	Agree, Strongly Agree, Disagree, Strongly Disagree
What was the most challenging part of the blog assignment?	Working with a partner, Word limit, Lack of references, Conversational writing, Others
Write additional comments about the blog assignment.	(students typed-in their comments)

As soon as the new set of blogs was posted, a brief five-point online quiz about the blogs was then prepared using the course online management system (Desire-2Learn or D2L). The class was then provided with the online links to the newly-posted blogs and informed about the corresponding quiz. They were given instructions to read the blogs prior to taking the quiz. Careful quiz design was utilized to ensure that the quiz answers could not be readily determined by simply scanning through the blogs. This was done to encourage students to read the blogs before taking the quiz. Students were given one week to take the online quiz with a four-minute time limit to complete the entire quiz.

The Survey

The survey was conducted after all the blogs have been posted. A survey instrument involving six questions was prepared and set-up in D2L for students to access and answer. Aside from asking students about challenges concerning the blog assignment and additional written comments, they were asked if they agreed with some statements. Before uploading the survey, the instructor discussed each statement in class and explained the meaning of the ratings “agree,” “strongly agree,” “disagree” and “strongly disagree.” Details of the survey instrument are shown in Table 1. The students were given one week to take the survey. A week after posting, the survey results were downloaded and organized. The Oklahoma State University Institutional Review Board approved the study protocol.

Results and Discussion

Course Information and Surveyed Population

Environmental Soil Science was designed as a senior-level course although juniors and sophomores who complied with the prerequisites and whose majors are Plant and Soil Sciences (PSS) or Environmental Science (ENVR) could register. The course focused on key soil science concepts vital in the understanding of processes related to the ecological regulator function of the soil. It also covers the role of the soil as the foundation of various ecosystems and its impact on waste management, water quality and global environmental concerns. Seventy percent of the 34 students in the

Table 2. Class Distribution and Major Degree Program of Students in the Environmental Soil Science Course

Class			Major				
Soph.	Junior	Senior	Ag Econ	An Sci	Env Sci	Hort	Plant-Soil
12%	18%	70%	15%	3%	32%	12%	38%

Figure 1. Student response to whether the blog assignment was a good way to learn a new topic and write about it in a conversational manner (A) and whether reading the blogs of others offered opportunities to learn new, interesting subjects (B).

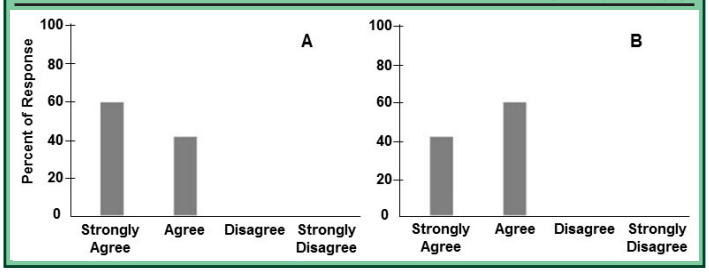
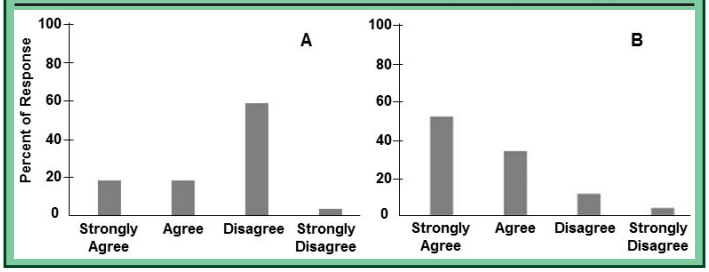


Figure 2. Student response to whether they could have learned more about a topic if they wrote a full-length term paper instead of writing a blog (A) and whether they prefer blogs over term papers as a course writing assignment (B).



class were seniors and mostly PSS and ENVR majors (Table 2). Everyone has taken the intro-level soil science course and has written at least one full-length term paper assignment in a previous course. At least one member in each pair has taken a technical writing course.

Blogs as Learning Tool

The assignment was designed to be a learning tool from two standpoints: as a writer (or author) and as blog reader. Blog writers are expected to have gained extensive knowledge about the assigned topic before they can write an informative blog especially because they were required to write the blog in a simplified, conversational manner. When asked whether the blog assignment was a good way to learn a new topic and write about it in a conversational manner, 100% of students at least agreed with 59% saying that they strongly agreed (Figure 1A).

In an ordinary writing assignment only one person, the author, learns about the topic. With the blogs shared to the rest of the class as a required reading assignment (note: students were quizzed about the blogs), all students were given many opportunities to learn something new. Survey results reveal that 100% of the students agreed or strongly agreed that reading the blogs of other students offered opportunities to learn new, interesting subjects (Figure 1B).

Blog versus Term Paper

The survey also aimed to determine whether the blogs could substitute full-length term papers as a learning tool and as a writing assignment. While Figure 1 has already indicated that the blog assignment was an effective teaching tool, it was equally important to determine how the students feel about blogs compared to a full-length term paper assignment. When asked whether they could have learned more about a topic if they wrote a full-length paper instead of a blog, only 38% of the students agreed or strongly agreed (Figure 2A). This indicates that majority (62%) of the students felt that writing a blog provided them at least an equal degree of learning as they could have gained from writing a full-length term paper. When asked whether they prefer blogs over a term paper as a course writing assignment, 85% of the students agreed or strongly agreed (Figure 2B). It should be noted that the blog assignment had a shorter length requirement than a full-length term paper and this could have contributed to greater preference of the blog.

Challenges and Student Comments

While the blog was an effective learning tool, as an assignment it came with some challenges. The 850-word limit was considered by 52% of the students as the most challenging part of this assignment (Figure 3). Mention of this challenge was also very prevalent in their comments. While this was expected, setting a low word-limit was done by design to encourage the student to really dig deep in their literature search to come up with only the most important key points about the topic. Working with a partner proved to be a major challenge for some students (20%). They mentioned problems with scheduling as well as differences in personality, writing styles, and the amount of time and dedication devoted

Figure 3. Challenges identified by students in connection to the blog assignment.

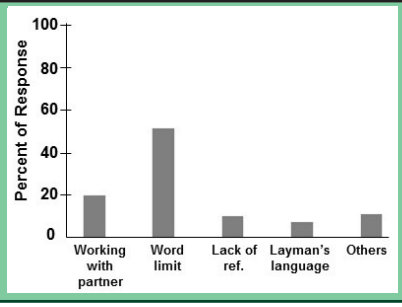


Table 3. Sample of Comments Provided by Students

Sample Comments
I thought it was a good way to work with others as well as learn about a topic. I think they could be improved by making the blogs a little longer because it was hard to keep it at 850 words.
I really liked the assignment and I think you could assign more, like maybe three. I feel like these blogs are a good replacement for papers because the students feel less pressure, so I think they will learn more. I also think it would be a good idea for students to be able to make up their own topic, so they can pick something they don't know very much about.
The blog is a great way to do something other than just write a paper. I would not say that it is any more or less beneficial than a paper. The blog allowed for an inch deep and a mile-wide understanding of a lot of subjects while a paper would have been more of a mile deep.
I really liked the blog idea rather than a full paper which usually just ends up in me attempting to reach a word minimum without plagiarizing sources. Asking for it to be in a conversational language forced me to understand the topic in depth but the work limit seemed a bit too short at times.

to the writing assignment as the root of the challenges in working with a partner. However, student comments were generally positive (92%; data not shown). Samples of student comments are listed in Table 3.

Summary

Writing assignments are important components in many courses. They allow students to learn about important topics that may not be discussed in class and provide opportunities for students to refine their writing skills under the guidance of an instructor. This study/survey was about utilizing blogs as a writing assignment. The method of managing the blog assignment was articulated in this paper and the results of the survey designed to gain student perception about this alternative teaching tool were presented. Survey responses reveal that students found the blog assignment as a good way to learn a new topic and write about it in a conversational manner. The students also agreed that reading the blogs of others was a good way to learn about new topics that were not discussed in the lecture. Most of the students prefer writing blogs over a full-length term paper and indicated that writing a blog provided them at least an equal degree of learning as they could have gained from writing a full-length term paper. From a teacher experience standpoint, the total time devoted to the blog assignment; including those spent for the initial meetings with the students, the review and corrections of the drafts, the verification of the references, the final review of the blog, the posting of the blogs, and the corresponding online quizzes, easily exceeded the time normally spent on a term-paper assignment. Despite the extra work, it was worth it because students indicated that not only was it a generally more-preferred writing assignment, it also accorded them opportunities to learn beyond the topic assigned for them to write about.

Literature Cited

Bâldea, M., A. Maier and O. Simionescu. 2015. Using blogs as a communication tool for teaching students in the architecture design studio. Procedia-Social and Behavioral Sciences 191: 2758-2762.

Baldwin, C.M., G. Hock and J.D. McCurdy. 2015. Student reflection of blogging in a turfgrass weed management course. NACTA Journal 59(4): 331-334.

Bigelow, C.A. and J.E. Kaminski. 2016. Social media and electronic networking use and preferences among undergraduate turf science students. Natural Sciences Education 45(1).

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

Chu, S.K., C.K. Chan, and A.F. Tiwari. 2012a. Using blogs to support learning during internship. Computers & Education 58(3): 989-1000.

Chu, S.K., A. C. Kwan and P. Warning. 2012b. Blogging for information management, learning, and social support during internship. Journal of Educational Technology & Society 15(2): 168-178.

Ducate, L.C. and L.L. Lomicka. 2008. Adventures in the blogosphere: From blog readers to blog writers. Computer Assisted Language Learning 21(1): 9-28.

Elola, I. and A. Oskoz. 2008. Blogging: Fostering intercultural competence development in foreign language and study abroad contexts. Foreign Language Annals 41(3): 454-477.

Fisher, L. and D. Kim. 2013. Two approaches to the use of blogs in pre-service foreign language teachers' professional development: A comparative study in the context of two universities in the UK and the US. The Language Learning Journal 41(2): 142-160.

Halic, O., D. Lee, T. Paulus and M. Spence. 2010. To blog or not to blog: Student perceptions of blog effectiveness for learning in a college-level course. The Internet and Higher Education 13(4): 206-213.

Kathpalia, S.S. and E.K. See. 2016. Improving argumentation through student blogs. System 58: 25-36.

King, K.P. 2002. Identifying success in online teacher education and professional development. The Internet and Higher Education 5(3): 231-246.

Lee, L. 2012. Engaging study abroad students in intercultural learning through blogging and ethnographic interviews. Foreign Language Annals 45(1): 7-21.

Odom, S.F., H.D. Jarvis, M.R.R. Sandlin and C. Peek. 2013. Social media tools in the leadership classroom: students' perceptions of use. Journal of Leadership Education 12(1).

Okan, Z. and H.U. Taraf. 2013. The use of blogs in second language teacher education. Procedia-Social and Behavioral Sciences 83: 282-289.

Ruiz, J.G., M.J. Mintzer and R.M. Leipzig. 2006. The impact of e-learning in medical education. Academic Medicine 81(3): 207-212.

Settle, Q., R. Telg, T. Irani, L. Baker, E. Rhoades and T. Rutherford. 2011. Instructors' social media use and preferences in agriculture classes. NACTA Journal 55(2): 78-83.

Top, E., 2012. Blogging as a social medium in undergraduate courses: Sense of community best predictor of perceived learning. The Internet and Higher Education 15(1): 24-28.

Williams, J.B. and J.S. Jacobs. 2004. Exploring the use of blogs as learning spaces in the higher education sector. Australasian Journal of Educational Technology 20(2): 232-247.

Preparing Future CALS Professors for Improved Teaching: A Qualitative Evaluation of a Cohort Based Program

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Abstract

The outcomes of the Graduate Teaching Scholars (GTS) program, a three-year cohort program that aims to develop pedagogical skills in PhD students in the College of Agriculture and Life Sciences at a Virginia Tech, are evaluated in this qualitative study. GTS is a response to historically poor preparation of faculty for teaching responsibilities and a need for improved teaching at the postsecondary level. This program is an intensive pedagogical training for doctoral students who desire to have teaching as an integral part of their professional career. Themes that emerged from this study included: participants' perceptions and experiences of the components of the program; recruitment and finding successful scholars was emphasized; and, the Scholars experienced tensions between research and teaching that provides preparation for a career in academia. Lessons for program improvement are reported. Participants communicated that the program format is effective for Scholars because they maintain their research efforts while also having the experience of lead instructor teaching. Long-term engagement with the subject of Agriculture and Life Sciences and positive relationships emerged as favorable program characteristics that supported Scholar learning. It was confirmed that all future faculty need more teacher training beyond serving as a teaching assistant (TA).

Introduction

Preparing effective future faculty in the agricultural sciences is important in the effort to train future agricultural scientists (Committee on a Leadership Summit to Effect Change in Teaching and Learning, 2009). Institutions, students and parents are expecting an increase in teaching ability in higher education (Austin, 2003). No longer is it assumed that demonstration of research expertise means that a person will be a successful faculty member (Austin, 2003). An emphasis on both teaching strategy, as well as research, defines the academic job market (Fowler and Cherrstrom, 2017). Faculty members experience tensions between research and teaching expectations that characterize professorship at institutions of higher education (Austin, 2002; Lewandowski and Purdy, 2001). Yet, doctoral preparation continues to focus on research preparation, with little emphasis on pedagogical practice or instruction preparation (Fowler and Cherrstrom, 2017; Price and Cotton, 2006). An awareness of this dearth of preparation in teaching skills of future faculty in the College of Agriculture and Life Sciences lead to the development of the Graduate Teaching Scholars (GTS) program at Virginia Tech. GTS is a three-year cohort program that aims to develop pedagogical skills in selected PhD students in the College of Agriculture and Life Sciences at Virginia Tech.

The purpose of this case study is to evaluate the effectiveness of GTS. The objectives were: to determine what aspects of GTS have an impact on Scholars; identify impacts that GTS has on the Scholars' teaching practice; and, identify attitudes and perceptions held by Virginia Tech CALS faculty and department heads regarding GTS.

GTS was designed to improve the teaching capabilities of future faculty members in the fields of Agriculture. This was done in response to the recognition that teaching is a core mission of the land-grant university and that there has been historically poor pedagogical preparation of faculty in the sciences. Preparing Future Faculty (PFF), a program launched in 1993, spurred the development of faculty preparation across PhD granting institutions. The efforts of this initiative molded an effective approach to future faculty development. The PFF effort identified that successful teaching faculty preparation program design needs to include a full scope of faculty roles and responsibilities, including teaching, research, service and how to balance the expectations that faculty experience within the campus setting. Program participants need to have multiple mentors

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and the preparation should be conducted as a part of a cluster of institutions (Gaff and Pruitt-Logan, 1998; Tice et al., 1998; National Research Council, 2000). Varying types of institutions have adopted and adapted future faculty development programs from this original call for faculty teacher development.

The GTS program design was informed by constructivist learning theory. Scholars learn through observation, experience and reflection. Constructivist theory states that individuals learn from the process of constructing meaning. To create meaning, people utilize prior knowledge combined with the experiences that they engage with (Merriam et al., 2006). Active cognitive processing is required by the learner; interpretation of reality is a prerequisite for the construction of knowledge; and, learners must have experience (Doolittle and Camp, 1999). Learners must be actively, mentally engaged in the learning process for the learning to be meaningful. Learners construct knowledge through the existing realities that can be socially constructed, individual-learner constructed or already exist (Schunk, 2015).

GTS also incorporates experiential learning. Robert's (2006) model of the experiential learning process states the learning process starts with a focus initially organized by the educator. Once that initial experience has occurred, the learner needs to reflect on the experience. Generalization then occurs when the learner can integrate information into their previous understanding and apply that new knowledge in their next effort. This process then repeats itself time and time again throughout the formal and informal learning process (Kolb, 1984; Roberts, 2006).

The format of GTS is grounded in an emphasis on learning, practice, reflection, and additional practice. Instructional skills should be introduced before instructional theory so that the future teacher is able to practice their skills before they work to hone their skills using theory (Wilkerson and Irby,1998). Reflection on teaching needs to be more than just determining whether the teaching strategy was effective (Kolb, 1984). Reflection should consist of studying and evaluating the specific teaching situation for enhanced skill development (Adler, 1991). Modeling is important for teacher preparation because teachers tend to mimic and demonstrate teaching practices from those that they have experienced (Richardson 1990). Focusing solely on experiential learning would not acknowledge that interactions between peers, educators and instructors influences the development of future faculty.

Materials and Methodology

The purpose of this case study is to evaluate the effectiveness of the Virginia Tech Graduate Teaching Scholars program (GTS). The Virginia Tech Institutional Review Board approved the study protocol and all participants provided written informed consent prior to participation in the study. Over a three-week period in the Fall semester, current program participants (n=5), program alumni (n=5), faculty mentors (n=4*), and administrators (n=5*) participated in either focus groups or interviews. No duplication of participation in an interview and focus group occurred. The asterisk denotes that one interviewee was both a faculty mentor and serves as a department head and therefore is counted in both populations. Table One illustrates who participated in the study. The Scholars' experience varied from having completed the first year in the program as a current Scholar to having graduated the program and working in their current positions for almost a year. The faculty mentors' experience ranged from serving as a mentor for at least a year to having completed the three-year commitment. Additionally, the department heads had a wide range of interaction with the program, varying from being a new interim Department head who had experienced the program as an outside observer to a Department head who had also served a mentor. All Department heads had interacted with program Scholars and were aware of GTS. Collecting data from the Scholars, mentors and the administrators in the department and college allowed for triangulation.

Table 1. Study Participants

Assigned Name	Relationship to the program	Gender	Age	Ethnicity
David	Mentor	Male	56	Caucasian
Shannon	Mentor	Female	35	Caucasian
Karen	Mentor	Female	52	Caucasian
Max	Mentor and Department head	Male	64	Caucasian
Tim	Department head	Male	55	Caucasian
Daniel	Department head (Interim)	Male	No response	Caucasian
Charlotte	Department head	Female	55	Caucasian
Laura	Administrator	Female	No response	Caucasian
Samantha	Alumni	Female	36	Chinese
Kristin	Alumni	Female	29	Caucasian
Molly	Alumni	Female	No response	Caucasian
Sarah	Alumni	Female	29	Caucasian
Grant	Alumni	Male	27	Caucasian
Pam	Current Scholar	Female	30	Chinese
Brad	Current Scholar	Male	26	Native American
Peter	Current Scholar	Male	31	Caucasian
Samuel	Current Scholar	Male	40	Caucasian
Jose	Current Scholar	Make	27	Hispanic

Focus groups were selected based on Morgan's (1997) observation that focus groups can generate interconnected comparison and contrasts in dialogue. This methodology reflected how Scholars' participated in GTS class sessions where they share their experiences in front of their peers. The Scholars were also familiar with the facilitator who served as their Teaching Assistant (TA); this reduced the unequal power dynamic in the process by having a fellow graduate student, rather than a faculty member, conduct data collection. The GTS Senior Scholar was not involved in data collection, transcription, or open-coding to provide Scholars anonymity.

Three focus groups were conducted involving nine participants who were grouped based on their role in the program. Focus groups were held in a conference room. Nine one-on-one semi-structured individual interviews were conducted by the same researcher. Interviews

Table 2. Study Interview and Focus Group Questions

Population, Order	Questions
Mentors, Department Heads (Q1)	Can you describe your role with the GTS program?
Alumni (Q1), Department Heads (Q2), Mentors (Q2), Scholars (Q1)	In your own words, what is the GTS program? Can you describe it?
Alumni, Scholars (Q2)	Why did you apply for GTS? (Follow Up) Now that you have, and have been a participant, do you feel that those reasons have been realized? How so?
Alumni, Scholars (Q3)	What do you think you have learned because of GTS?
Alumni (Q4)	What are you currently doing professionally now? How did GTS influence this?
Alumni, Scholars (Q5)	The GTS program has many different components can you talk about what those components are?
Alumni, Scholars (Q6)	If you had to select a component that has helped you learn the most for your current role, what would it be and why?
Alumni, Scholars (Q7)	If you had to select a component that has not helped you, what would it be and why?
Alumni, Scholars (Q8)	Now that you have completed GTS, is there a component of the program that you think that the organizer should incorporate into the program? Why?
Mentors, Department Heads (Q9)	Would you encourage current Ph.D. students to participate in GTS or would you recruit/recommend a future Ph.D. student into the GTS program?
Mentors, Department Heads (Q3)	What do you think Scholars have gotten out of the GTS program? Academically? Professionally? as Instructors?
Mentors, Department Heads (Q4)	How would you describe the relationship that you have with the Scholar (s) that you work with? Follow-up question: Is this different than how you work with and interact with other students?
Mentors, Department Heads (Q5)	Can you give an example of a time when a Scholar did something that was noteworthy (Positive or negative) that you could attribute to the program?
Mentors, Department Heads (Q6)	What have you have learned because of participation with GTS? Follow-up question: Have you seen changes in your department?
Mentors, Department Heads (Q7)	Why would you encourage a potential PhD student to apply for GTS? Follow-up question: Have you?
Alumni, Department Heads, Mentors, Scholars	Wrap Up: We have reached the end of our preplanned questions. Is there anything else you would like to share with the research team?

Interview and focus group questions were the same for each population. (Q#) refers to the question order the preceding population was asked the question.

were conducted in a private setting chosen by the participant. Two Scholars participated in the study virtually: one by Skype video call to participate in a focus group, and one via a phone call interview. Standardized questions were asked of both the focus groups and in the semi-structured interviews. Each study population had variation in questions. The questions asked are provided in Table Two Focus Group and Interview Questions.

The interviewer took field notes after the completion of the semi-structured interviews and focus groups. Audio recordings were transcribed verbatim. Transcripts were line-by-line open coded and the codes were developed based on the emerging information collected from participants. Analytical memos and field notes were reviewed during the process of coding (Creswell, 2012). Codes and themes were reviewed by another researcher to achieve inter-coder agreement (Creswell, 2013). Codes and analytical memos were then used to develop final themes (Creswell, 2013).

Limitations. It is important to acknowledge the evaluators' reflexivity. The researchers were intimately involved in the development, creation and implementation of the program. This provided an in-depth knowledge of the program design and intent. The researchers have taken pains to highlight both the strengths and weaknesses of the program's design because of their closeness to GTS.

In the effort to triangulate student learning and successes, department heads were included in the study. It turned out that this population was not always well informed about the specific Scholar outcomes. This population therefore was unable to provide confirmation of Scholar teaching effectiveness. Department heads did provide insight on other impacts such as faculty adoption of pedagogy practices as well as their perspectives on the importance of GTS.

Results and Discussion

From the data, three themes emerged. As an evaluation, feedback on the program's design was organized into three themes: 1) Participants' perceptions and experiences of GTS program components, with six sub-themes, including areas of improvement. Additional themes emerged out of the data that informs the preparation of future faculty; they are 2) Recruitment and finding successful Scholars, and 3) Preparation for a career in academia.

Theme 1: Participants' Perceptions and Experiences of GTS Program Components

Scholars talked extensively about the many components of the GTS Program. Each program cohort includes six to eight doctoral students (there are always three cohorts active in the program in any given year). In a three-year program, Scholars first observe their mentor teaching. In the second year they co-teach or TA, and in the third year they take on the responsibility as Instructor of Record for the course they've been working with throughout the program. The Scholars maintain their own research responsibilities in their academic departments while also attending weekly class sessions on pedagogy, enroll in the Universities' Pre-Professoriate Certificate, and complete an educational research project. Other expectations include attending an annual on-campus international conference on pedagogical practice, as well as other professional development in-service experiences each semester.

Weekly sessions. Scholars meet weekly in their cohort for a two-credit class. The content of this class adapts and changes over the six semesters that they participate. The emphasis throughout their enrollment is reflection on teaching and learning, whether it is from the perspective of observation or personal experience. Scholars consistently referenced this component as the one part of GTS from which they learned the most as Molly, an alumni said, *"I think [the class sessions] had the most influence because it was so regular, it was*

like every week for 3 years, there was a lot of time in there to learn, to discuss, and to also just to collaborate with people around you, so that was probably [where I] learned the most from."

Molly in this quote also highlighted two additional points. She emphasized the long-term interaction and relationships that are built from the program. When the Scholars were asked what they had learned from GTS, they regularly referenced topics that had been covered and discussed within the weekly sessions. Some of those topics included: teaching and learning theory, unit and lesson planning, teaching objectives, and assessment strategy. Besides the content that was covered during the class sessions, Scholars emphasized that the opportunity to practice teaching in front of their peers was beneficial. Jose, a current Scholar said, *"we were given the task of actually giving a lecture during one of those group meetings and I thought that was really really useful."* Molly emphasized the comfort that the Scholars had with each other, saying *"we didn't really teach in front of each other until we knew each other, and that is more teaching in front of your friends and if you mess up and you say something wrong you are totally comfortable."* The Scholars appreciated the opportunity to practice their teaching in front of their peers before they were asked to teach in front of a classroom of students. The practice was valuable because it was a safe space filled with friends, not just peers, and the feedback was constructive. Scholars emphasized that the weekly class sessions were an important part of the overall program requirements and that it was a foundation for other program components.

Experience of Teaching. Scholars who had completed their lead instructor teaching requirement said that teaching experience was the most valuable part of the program. Scholars recognized benefits to their own teaching and to themselves personally. Sarah was philosophical in her answer to a question about which program component was most beneficial to her, saying *"I would say that being instructor of record is the most beneficial component, but I don't really think that… I would be really hesitant to say that is what people need, just throw someone in there, I think you need the support and the structure around it to make that better and to improve on, I think that is the most important, but without the supporting structure [of the GTS program], I don't know that [teaching] would have been good."*

Teaching was viewed as very important especially with the support of weekly classes and the other learning components of GTS.

The benefits to the Scholars' teaching included applying learned theory and practice while being responsible for classroom management. Scholars that had yet to serve as Instructor of Record often expressed frustration about the over emphasis on theory in the weekly class sessions. But those that served in the capacity of Instructor of Record discussed how they were able to apply theory in the classroom context. Grant stated that he had learned while teaching *"[something] about the challenge and the independence of applying learning and teaching theory to a specific discipline."* He was able to achieve fluidity in connecting the content and teaching theory with which many of the pre-teaching Scholars struggled. Peter, when reflecting on his teaching experience, explained that he learned how to *"be sensitive to your class. Are they picking up on the concept that you are trying to get across to them, and if not, why, and how can you change your delivery style?"* Peter, through this statement, demonstrates that during his experience teaching he was able to integrate reflection on his own teaching to improve his responsiveness to student needs.

Classroom management was part of the teaching experience that caused the most surprise for the Scholars. Pam noted class management was the thing that she learned the most about while teaching, saying *"previously I did not realize that there is such a thing as class management."* Pam was joined by Samuel in her surprise about class management. He said, *"the opportunity to be instructor of record is also relevant experience, not just the teaching, but the management of class, all the backstage part of being a professor, which you have absolutely no clue until you do it, that was also really good experience."* Other Scholars reported that having the responsibility of managing a class was important. They also acknowledged the difficulty in keeping up with the many demands from the students, including constant communication, especially for those with large lecture classes.

An unexpected benefit that emerged was that Scholars recognized that their personal communication skills had improved. Pam, an international student, said that besides teaching, that her biggest improvement from the program was communication skills, *"like teaching itself is a communication between the instructor to student."* Pam focused on her own personal ability to communicate in the classroom setting, whereas Kristin, a program alumna, said her biggest takeaway was the experience of "communicating with other peers" she also learned *"how we share information, and how we… give constructive suggestions."* Her experience was more about gaining skills in working with group dynamics than the experience from Pam about public presentation ability. Grant underlined the importance of communication skills when he said, *"if you are going to be highly educated… people will ask you things and will want to know things from you simply because of the credentials. And, the breadth of situations that I can now feel comfortable teaching people in is now wider than it had been, in terms of being more comfortable and being comfortable talking in front of a group, and really thinking through how to convey information, and like provide a learning opportunity. And, it seems like that in life you are way better off if you can… communicate effectively."*

Whether Scholars experienced gains in public presentation or interpersonal communication skills they felt better prepared and confident because of their teaching experience.

The implementation of a successful teaching experience for students was not without challenges. In some of the departments there was concern about a PhD student serving as Instructor of Record. Tim, a department head said, *"my concern is that we have students and their families who are paying a lot of money for them[Undergrads] to be here and it may not always be the best thing for a graduate student to be primarily responsible. A department like ours does not teach a lot of freshman and sophomore level courses, where you might think, it's a PhD level student teaching Freshman and Sophomores there should be enough of a gap if you will between."* The department head was concerned about the age of the Scholars but not the knowledge or capability of the Scholars. This sentiment was not universal as other department heads had Scholars lead graduate classes. However, several Scholars discussed receiving pushback about being qualified instructors for their classes. Samantha said *"I …got [student] Survey's saying, is a student really qualified to teach?...but, I never had the experience of a student going around [talking to others about me], at least I didn't know of any experiences."* Other Scholars had experienced undergraduates going to other people in the department, including the faculty mentor or the department head, with complaints about grading, the syllabus or class instruction. Grant, who had experienced some of the pushback from undergraduates in his class, reflected, saying, *"I didn't frame it correctly really, fundamentally from the beginning. Or, I don't know, they needed to get some letter from the Dean that is like, this person is teaching your class because he is in this program and is tightly supervised, but, is in charge."* Grant wanted authority granted to him by the department. David, a faculty mentor, made this observation and recommendation, *"I think the [Undergraduate] student a lot of times will think, oh this is a graduate student, so I don't need to respect them the same way they are respecting, when I have an ol' bald headed professor up there."* David discussed what he did to provide legitimacy to Pam, the Scholar that he mentored. Students were e-mailing him, and he reported that he kept redirecting the undergraduates back to her saying *"this person is teaching the class, it is her class, go talk with her."* No matter what level of respect or legitimacy that Scholars were given by either undergraduates or administrators the teaching experience was valuable to the Scholars. However, the uncertainty added stress and difficulty for the Scholars during the teaching experience.

Mentor-Mentee Relationships. Scholars expressed a predominance of neutrality towards their mentor relationship. In contrast, the mentors expressed a strong supportive connection with the Scholars' learning process. Samantha said, *"I think my experience was more 'here is the class' if you have any questions, let me know."* This sentiment was expressed by other Scholars. They attributed this laissez fair approach by mentors to their uncertainty about the mentor's role, or even a clarity of how they were supposed to interact with the mentor. However, as Grant put it *"my Mentor didn't really help me, but, also didn't harm me. He didn't stop me from doing anything."* The Scholars also did not identify feeling thwarted from applying their knowledge in the classroom although they did not highlight mentors as being important sources of pedagogical or implementation support. This was not consistent though; Jose described working with his mentor stating, *"I have been working with her, working on my presentation skills taking that kind of lead position as far as teaching the class itself."* Jose expressed having a good working relationship with his mentor, who he felt was investing in his personal and professional development.

The mentors unanimously expressed a strong supportive connection with the Scholars learning process. The mentors were invested in the learning process and viewed their relationship with the Scholar as valuable for the mentee. They saw their role as being a teacher of the Scholar and did this by scaffolding responsibility and working with the Scholar to transition the class. A mentor did express uncertainly about what their official role was as a mentor in the program, but still was supportive of creating a learning environment with the mentee.

Relationships were developed over the three-year period between mentees and mentors. Shannon recognized that her mentor relationship was stronger with her GTS mentee, saying, *"there are so many aspects of teaching nowadays, how students relate to you personally. So [my GTS mentee and I] have lots of conversations about gender differences, international issues, and so it's in some ways it's much much more personal conversations I have with her, than I have with my own graduate students because there is not much personal about modeling global soil respiration. It just, just doesn't come, at least at this stage. I mean [GTS mentee and I] talk about the future, that doesn't come in. …the mentoring in this program has been much more, much more personal than with my other students."* Max said, *"I had a very intimate relationship with … [Scholar's name] and I really got to know her very well"*. Max used the word intimacy to characterize the very intense platonic working relationship that emerged because of the length of the project and the nature of teaching a class together. He recognized the professional relationship grew into a deep collaboration and was more intense than his advising role with other PhD students.

When the mentors were asked if they had learned from the Scholars, they expressed that they had. Predominantly their awareness was about student-centered pedagogical practices. In many cases the mentors expressed a desire to implement pedagogical practices the Scholars had shared with them. David recognized a desire to implement new educational strategies, saying, *"Pam (GTS Scholar) was much better than me in terms of engaging the students in activities and so I talked to her about that… I'm more from the lecture format which is pretty stale and boring, for the current generation,*

probably any generation, … she was much better at breaking the class up into little segments..." The Scholars underlined that their mentors recognized the value of a student-centered approach.

Research Component. The Scholars were asked to complete one original research study in partnership with an education faculty member and their mentor. The study could result in publication, ideally a journal manuscript, but at minimum a conference poster or presentation. The Scholars start work on the research project in the first year of the program so that they can implement it before the end of their third year. Scholars talked extensively about the research experience. It was the experience to which the Scholars attributed the least amount of pedagogical learning, but they regarded it as a valuable part of the program because it allowed them to publish and get credit for their efforts. Only one of the mentors that was interviewed was pre-tenure and they expressed uncertainty about their contribution to this program and if it would help towards their tenure packet. The research component was specifically highlighted as a way he/she saw his/her efforts rewarded and valued. The mentors emphasized that they felt that publications and research, not teaching, is how their efforts are being measured and rewarded and therefore the research component provided tangible return on investment.

Three-year program. The program is a three-year experience. Scholars spend the first year observing and/or serving as a Teacher's Assistant (TA). The second year they take on more responsibility with the class and serve in an advanced capacity, often as a co-instructor. The third year the Scholar is listed as the Instructor of Record and they take on full responsibility of the instruction of the class. Over this time period the Scholars are also responsible for redesigning the course and writing lesson plans. Although this plan is the ideal, due to circumstances, some Scholars have undertaken the teaching approach quite differently. For example, a Scholar was Instructor of Record in year one of the program while his mentor and advisor was on sabbatical. The three-year program was recognized as an important piece of the program. The time allowed Scholars to become comfortable in their relationships and teaching responsibilities. They were able to grow in their understanding because they had peers in their cohort also going through this process and they established long-term relationships built on trust. Additionally, they were able to reflect on the teaching process, not only after teaching a specific class session, but to see the same lessons being taught multiple times over three years allowed them to fully recognize the strengths and weaknesses of the course design, and then implement changes. The Scholars and the mentors recognized the length of the program as a considerable asset for the growth and development of students' teaching practice.

Areas for Improvement. When asked about the program aspects that Scholars liked the least they described the need for consistent and formalized feedback from coursework and peer observations. They expressed a desire to have constructive and timely feedback on both written work and their teaching experience. Scholars also expressed a desire for a balance between theoretical and practical teaching application in the weekly class discussion.

The Scholars and mentors alike expressed uncertainty about the role and responsibilities of the faculty mentor and the Scholars. A recommendation that has emerged from this study is that the faculty mentoring relationship is important for the participant. However, for this mentor-mentee relationship to be effective the roles and responsibilities of the mentor need to be clearly defined. Additionally, the program can provide greater support for the mentor, which could lead to reciprocal learning and improved support of the Scholar through the process.

Theme 2. Recruitment and Finding Successful Scholars

This intensive program should not be the approach for training all future faculty; this program is designed for the future faculty member who has realized he or she wants to be dedicated to excellence in teaching. Scholars' interests may vary widely on where they would like to end up teaching, ranging from a Tier 1 research institution to a Community College, or taking positions with Cooperative Extension. Whatever the motivation of the Scholar, it was recognized that matching participants' interest in teaching and career goals with the program objective was essential. Despite the extensive time commitment, the passion and drive to become a teaching faculty member was what kept the Scholars engaged with, and successful in the program. Scholars recognized that the emphasis on teaching used valuable mental energy, increased their PhD workload, and did not allow them to focus solely on their research. These three factors were viewed as an opportunity cost they were willing to accept because of their commitment to teaching excellence.

The commitment of institutional resources to each student is extensive and would be prohibitive for the training of all future faculty, particularly in an area that the student may not want to emphasize in their future work. It was recognized by department heads and mentors, and especially Scholars, that the financial support of the half of the Assistantship provided by the college was very important in the recruitment and retention of Scholars. The financial resources provided an important motivation for participation in the program because it provided stable twelve-month funding for the Scholar. The department heads also appreciated the opportunity for additional funding from the college to stretch their department dollars farther while supporting a student that was giving back to the department.

Theme 3. Preparation for a Career in Academia

The Scholars expressed feeling tension between their research and teaching requirements. These ten-

sions were both about time and mental energy. The time tension was generated from their home departments' emphasis on research and publication and the juxtaposition that they felt placed in because they were also in a program emphasizing teaching. The Scholars identified it took a lot of mental energy when they were in the role of instructor. In addition to the responsibility that comes with being the instructor of record it took a lot of energy to prepare course materials and to prepare for class instruction. The instructor of record responsibility includes student communication, grading and overall classroom management. These tasks were regularly discussed as challenges of the classroom-teaching experience and were important aspects for the Scholar to learn about and balance with their own research requirements.

While the Scholars were growing in their teaching responsibilities they were still expected to keep half an assistantship in their home department and continue their own research towards their dissertation. They are expected to make progress on both research and teaching. Many Scholars expressed the feeling of being asked to give double the effort because their home department was expecting the same level of research output as their peers, while also having a teaching commitment. An alumni Scholar stated that "This is what we are expected to do, we will need to do it in the real world." The mentors and department heads supported the Scholars in their assessment, acknowledging that Scholars were having to do quite a bit more in their preparation because the program was so intensive. However, they also expressed support that the Scholars were experiencing the full-faculty experience because of the tension between research and teaching.

Summary

As Universities continue to find their market advantage, teaching has and will become more important (Hanover Research, 2014). Preparing future higher-education educators will be important for the future of research as we prepare the next generation of CALS faculty. The program elements of GTS were effective in supporting Scholar learning about teaching skills, which was congruent with recommendations from PFF (Tice et al., 1996). It was recognized by GTS Scholars, mentors, and department heads alike that being a Teaching Assistant was not enough preparation to become an effective lead instructor. Serving as an instructor and experiencing the responsibility of responding to student needs and for classroom management was important for developing teaching efficacy. Yet, it was acknowledged that not everyone should be included in such an intensive teaching preparation program because of the opportunity costs to Scholars' research and work load. Levels of training need to be provided that reflect the career objectives of doctoral students. In all cases it should include more than just serving as a TA (Williams, 2005). Future teaching preparation should include an aspect of direct teaching, development of positive peer and mentor relationships, and long-term support for strong teaching skill development. The GTS program provides a template departments or Colleges of Agriculture and Life Sciences can use to enhance future faculty pedagogy skills.

Literature Cited

Adler, S. 1991. The reflective practitioner and the curriculum of teacher education. Journal of Education for Teaching 17(2): 139-150. DOI: 10.1080/0260747910170203.

Austin, A.E. 2002. Preparing the next generation of faculty: Graduate school as socialization to the academic career. The Journal of Higher Education 73(1): 94-122. DOI: 10.1080/00221546.2002.11777132.

Austin, A.E. 2003. Creating a bridge to the future: Preparing new faculty to face changing expectations in a shifting context. The Review of Higher Education 26(2): 119-144. DOI: 10.1353/rhe.2002.0031.

Committee on a Leadership Summit to Effect Change in Teaching and Learning. 2009. http://dels.nas.edu/dels/rpt_briefs/ag_education_final.pdf. Transforming Agricultural Education for a Changing World.

Creswell, J.W. 2012. Qualitative inquiry and research design: Choosing among five approaches. Thousand Oaks, CA: Sage Publications.

Doolittle, P.E. and W.G. Camp. 1999. Constructivism: The career and technical education perspective. https://ejournals.lib.vt.edu/JCTE/article/view/706/1017. Journal of Career and Technical Education 16(1). https://ejournals.lib.vt.edu/JCTE/article/view/706/1017.

Fowler, D. and C.A. Cherrstrom. 2017. Graduate student perception of teaching development in a college teaching course. NACTA Journal 61(2): 150-156.

Gaff, J.G. and A.S. Pruitt–Logan. 1998. Preparing college faculty. New Directions for Higher Education 1998(101): 77-86. DOI: 10.1002/he.10107.

Hanover Research. 2014. Trends in higher education marketing, recruitment, and technology. http://www.hanoverresearch.com/media/Trends-in-Higher-Education-Marketing-Recruitment-and-Technology-2.pdf.

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

Lewandowski, G. and C.C. Purdy. 2001. Training future professors: The preparing future faculty program in electrical and computer engineering and computer science at the University of Cincinnati. http://cerebro.xu.edu/~lewandow/papers/asee2001.pdf. In: Proceedings 2001 American Society for Engineering Education Annual Conference and Exposition.

Merriam, S.B., R.S. Caffarella and L.M. Baumgartner. 2006. Learning in adulthood: A comprehensive guide. 3rd ed. San Francisco, CA: Jossey-Bass.

Morgan, D.L. 1997. The focus group guidebook. Volume 1. Thousand Oaks, CA: Sage Publications.

National Research Council. 2000. Graduate education in the chemical sciences: Issues for the 21st Century: Report of a workshop. National Academies Press. Graduate Education in the Chemical Sciences-Issues for the 21st Century. By the Board on Chemical Sciences and Technology, the Commission on Physical Sciences, Mathematics, and Applications, and the National Research Council. 2000. Washington, DC: National Academy Press.

Price, J. and S.R. Cotten. 2006. Teaching, research, and service: Expectations of assistant professors. The American Sociologist 37(1): 5-21. DOI: 10.1007/s12108-006-1011.

Roberts, T.G. 2006. A philosophical examination of Experiential Learning Theory for agricultural educators. Journal of Agricultural Education 47(1): 17.

Schunk, D.H. 2015. Learning theories: An educational perspective. Pearson.

Tice, S.L., J.G. Gaff and A.S. Pruitt-Logan. 1998. Preparing future faculty programs: Beyond TA development. The professional development of graduate teaching assistants, 275-292. Preparing Future Faculty Programs: Beyond TA Development. In: Professional Development of Graduate Teaching Assistants: The Practitioner's Handbook. Michelle Marincovich, Jack Prostco and Frederic Stout (eds.). Boston, MA: Anker Publishing.

Williams, L. 2005. From TA to faculty member: The socialization of doctoral completers. University of New Orleans Theses and Dissertations. Paper 248.

Wilkerson, L. and D.M. Irby. 1998. Strategies for improving teaching practices: A comprehensive approach to faculty development. Academic Medicine 73(4): 387-96.

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Educational Value of Human-Animal Interactions in Post-Secondary Animal Sciences Curricula[1]

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Abstract

The objective of this study was to determine if the presence of a live animal in a post-secondary educational setting affects academic achievement, knowledge retention, and physiological responses. An experimental design was implemented consisting of a control group presented with scientific information regarding nine different animal species and a treatment group presented with the same information in the same format and setting but with the addition of the corresponding live animal present in the room. Ten students from the treatment group were selected to wear heart rate monitors to evaluate physiological responses. A pre-/post-test methodology was utilized to measure academic achievement while a second post-test was administered one week after the presentations to determine knowledge retention. Overall, the results of this study suggest that the presence of a live animal, as well as the type of animal, can influence academic achievement, knowledge retention, and physiological responses such as heart rate. Moreover, the presence of a live animal also has a positive effect on attitudes toward the animal, which may translate into increased interest in the well-being and management of the animal.

Introduction

Human-animal interactions have been the focus of scientific study for many decades and the impact of these interactions on both humans and animals is well documented. Positive interactions with handlers have been reported to reduce stress and improve productivity in farm animals (Zulkifli, 2013; Waiblinger et al., 2006; Zulkifli and Siti Nor Azah, 2004; Hemsworth, 2003; Breuer et al., 2003). Similarly, positive interactions with animals have been shown to reduce stress and improve health and well-being in humans (Hodgson et al., 2015; Allen et al., 2002).

Human-animal interactions have also been shown to influence learning and behavior in students of all ages. Pre-school children showed an increased ability to focus on a given task and a reduced need for instructional prompts when a dog was present in their classroom while first-grade students showed more empathy and less aggressive behaviors (Hergovich et al., 2002; Gee et al., 2010a; Gee et al., 2010b). Fourth-grade students demonstrated improvements in cognitive learning when handling live or preserved animal specimens; however, improvements in affective learning were observed only when students handled live animals (Sherwood, 1989). Middle school students who were exposed to live animals in the classroom scored better on achievement tests compared to a control group, yet researchers found no differences in test scores among students exposed to live animals or videos of animals in the classroom (Hummel and Randler, 2012). Furthermore, a study of college students enrolled in an introductory biology class found no differences in academic achievement or retention for students taught using live animals compared to those that were taught using images of the animals (Krull et al., 2015). However, the students exposed to the live animals did show an increase in intrinsic motivation.

College agricultural programs often utilize live animals as educational tools to teach a variety of disciplines including animal behavior and physiology. Although studies suggest that the presence of animals positively influences student learning and behavior, there are very few, if any, explanations for this occurrence. Research in other fields of study suggests that student learning and academic performance may be influenced by their psychological and physical responses to a variety of stimuli (McCoy et al., 2014; Hillman et al., 2009). However, an association between academic achievement, knowledge retention, and physiological responses in the presence of live animals in an educational setting has not yet been evaluated. Therefore, the objectives in the present study were to determine if the

[1]The use of human subjects was approved by The Ohio State University Institutional Review Board protocol #2015B0302.

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presence of a live animal in an educational setting influences student knowledge and retention, and if physiological variables, as measured by heart rate, may be related.

Methods

Participants (n=19) in this study were volunteer recruits who were enrolled in the Introductory Animal Sciences course offered through the Department of Animals Sciences at The Ohio State University. All participants were assigned a wristband with an identification (ID) number to be used throughout the study. This allowed for anonymity of data collection since participants were asked to only use their ID number on all completed surveys and tests, while still allowing for data links between surveys and tests. Once ID numbers were distributed, all participants completed a demographic survey (Table 1) as well as a survey asking them about their attitudes towards animals (Table 2). Participants were randomly assigned into one of two groups: control (no live animal/recorded audio visual presentations) or treatment (live animal/recorded audio visual presentations) and one-half of the participants in each treatment group were randomly selected to complete a knowledge pre-test. The study took place in a controlled classroom environment over three consecutive evenings during which one of three categories of animals (companion, agricultural, and exotic; one category/night) were represented by three species within each category for a total of nine presentations (Table 3). Each presentation lasted 5-7 min and included the same information about the animal such as social structure, diet and life span. Students assigned to the treatment group wore a heart rate (HR) monitor during each presentation. HR data were recorded when the animal entered the classroom (HR1), when the animal moved to a designated location 2 m from the students (HR2), and when the animal left the classroom (HR3) at the end of the presentation. At the end of each evening, a knowledge post-test was administered to measure knowledge gained and for those wearing a heart rate monitor an emotion survey was also administered to determine the emotion that best described how the participant felt while in the presence of the animal. A second post-test was administered one week later to measure knowledge retention. Survey and test data were analyzed with SPSS Statistical Software. HR data were analyzed using the GLM procedure of SAS v. 9.3 (SAS Institute; Cary, NC) and a p value of ≤ 0.05 was considered statistically significant.

Table 1. Descriptive statistics of demographic variables collected from student (n=19) surveys.

Animal Sciences Major	13
Gender	
Male	15
Female	4
Former FFA Member	4
Former 4-H Member	6
Zoo Visits in Past 12 Months	
None	5
1-2	11
3-4	2
5+	1
Live/Lived with Pet	18
Live/Lived on Farm	7

Table 3. The order in which animals were presented to students participating in the study.

Day	Category	Species
1	Agricultural	Pig, Chicken, Horse
2	Companion	Dog, Cat, Cockatiel
3	Exotic	Cheetah, Fox, Penguin

Results and Discussion

Although many disciplines anecdotally proclaim that the presence of an animal increases the academic achievement regarding the animal, the scientific community has inconclusive evidence to support this claim. Moreover, the scientific community has focused on the use of small vertebrates (e.g., mice, guinea pigs, lizards) in the examination of this hypothesis, possibly due to restricted resources or availability of animals, and has yet to fully examine the use of large, possibly even novel vertebrates. Additionally, the research has concentrated on early and primary student populations, virtually ignoring the post-secondary student population. Hence, the current study sought to fill this gap by concentrating on the post-secondary student population and the use of large animals in an educational setting.

Overall, results of this study suggest that the presence of a live animal during an educational experience can positively influence academic achievement (Figures 1a and 1b). Although not statistically significant, knowledge gain, measured by the change in score from the pre-test to post-test 1, showed slight improvement with the presence of a live animal; while knowledge retention, measured by the change in score from post-test 1 to post-test 2, showed a seven-point increase with the presence of a live animal compared to the control group. These results add to the growing scientific literature supporting the use of live animals in educational settings.

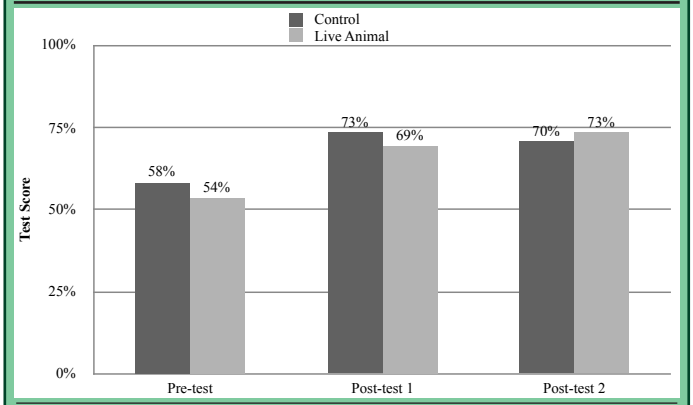
Agricultural, companion, and exotic animals were used in this study to determine if the type of animal could impact academic achievement. The presence of live agricultural animals in the classroom resulted in a 5% increase in knowledge gain; however, there was no effect on knowledge retention (Figures 2a and 2b). Within the category of agricultural animals, the presence of the pig had the largest impact on knowledge gain (17% increase) compared to the chicken (2% increase) and the horse (4% decrease) (Figure 2c). Conversely,

Table 2. Participant attitudes towards animals based on a survey taken at the start of the study.[a]

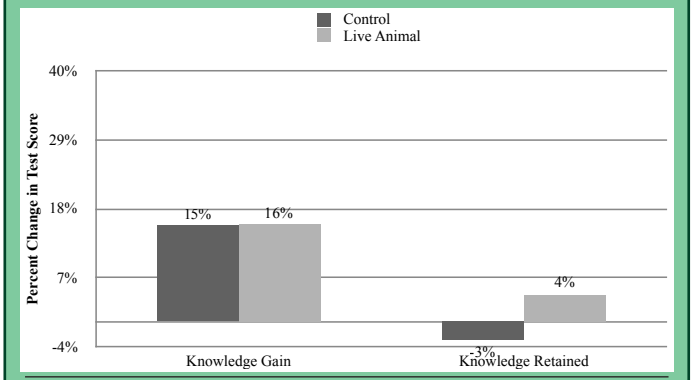
Species	Mean	Species	Mean	Species	Mean	Species	Mean
Dog	2.72	Pig	1.83	Robin	0.83	Rat	0.12
Cheetah	2.22	Chicken	1.83	Bat	0.78	Crow	-0.11
Elephant	2.17	Turtle	1.72	Cockatiel	0.72	Ladybug	-0.17
Horse	2.11	Butterfly	1.65	Lizard	0.67	Skunk	-0.17
Penguin	2.11	Eagle	1.56	Shark	0.56	Rattlesnake	-0.44
Cat	2.06	Squirrel	1.22	Salmon	0.44	Vulture	-0.89
Rabbit	2.06	Wolf	1.11	Trout	0.39	Cockroach	-1.44
Fox	2.06	Swan	1.00	Raccoon	0.28	Wasp	-2.28
Cow	1.94	Turkey	0.89	Coyote	0.17	Mosquito	-2.61

[a] Data represent the mean scores of a 7-point Likert-type scale in which 3 =Extremely Like, 0=Neutral, and -3=Extremely Dislike.

Figure 1. Effect of the presence of live animals in an educational setting on academic achievement and knowledge retention.

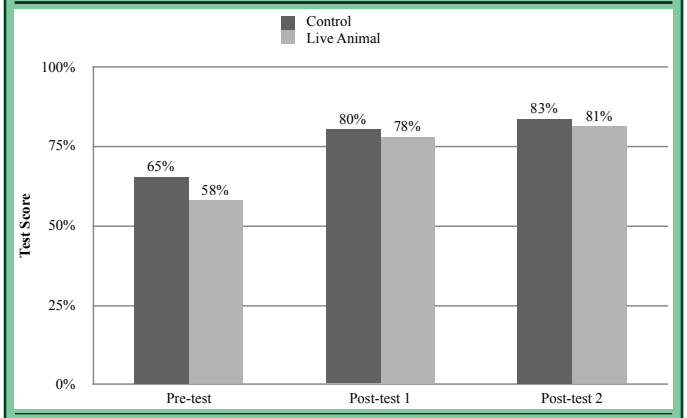


a) Participants (n=19) were randomly assigned into one of two groups: control (no live animal/recorded audio-visual presentations) or treatment (live animal/recorded audio-visual presentations). Half of the participants in each treatment group were randomly selected to complete a knowledge pre-test. The study took place in a controlled classroom environment over three consecutive evenings during which one of three categories of animals (companion, agricultural, and exotic; one category/night) were represented by three species within each category for a total of 9 presentations. Each presentation included the same information about the animal such as social structure, diet and life span. At the end of each evening, a knowledge post-test was administered followed by a second post-test one week later. Survey and test data were analyzed with SPSS Statistical Software. Data represent the average test scores across all animal categories.

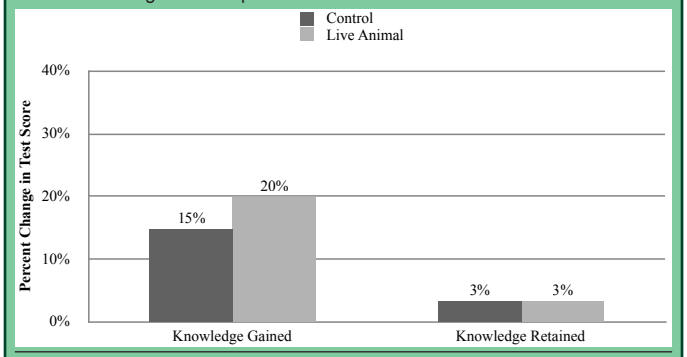


b) Knowledge gained was calculated by comparing the change in pre-test scores to the first post-test scores. Knowledge retention was calculated by comparing the change in the first post-test and second post-test scores.

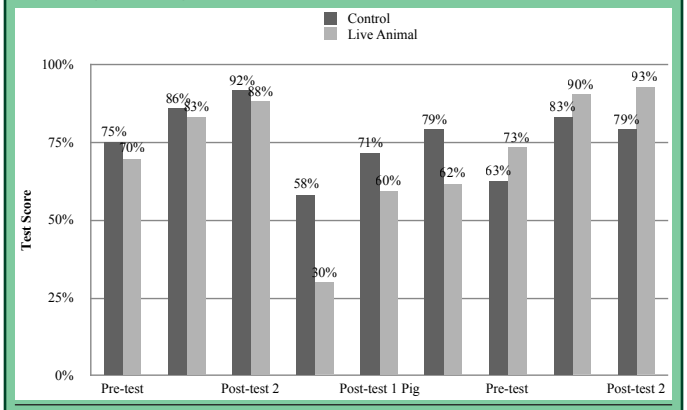
Figure 2. Effect of the presence of agricultural animals in an educational setting on academic achievement and knowledge retention.



a) Participants (n=19) were randomly assigned into one of two groups: control (no live animal/recorded audio-visual presentations) or treatment (live animal/recorded audio-visual presentations). Half of the participants in each treatment group were randomly selected to complete a knowledge pre-test. The study took place in a controlled classroom environment and agricultural animals were represented by three species for a total of 3 presentations. Each presentation included the same information about the animal such as social structure, diet and life span. At the end of each evening, a knowledge post-test was administered followed by a second post-test one week later. Survey and test data were analyzed with SPSS Statistical Software. Data represent the average test scores across agricultural species.



b) Knowledge gained was calculated by comparing the change in pre-test scores to the first post-test scores. Knowledge retention was calculated by comparing the change in the first post-test and second post-test scores.

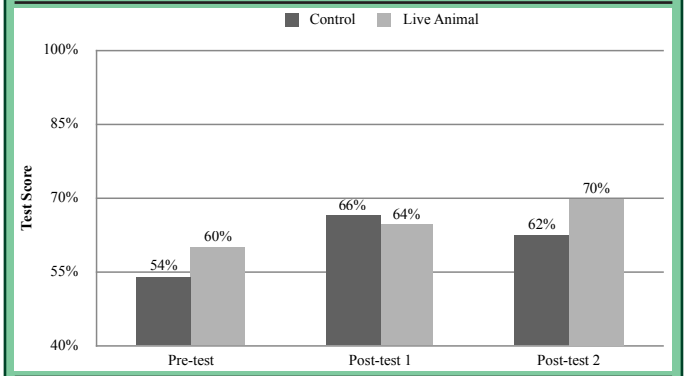


c) Data represent the average test scores for each specie.

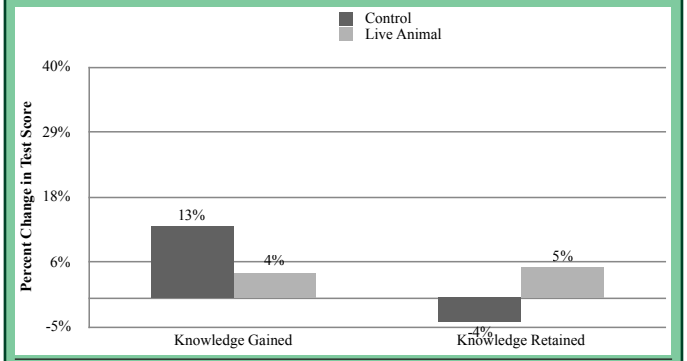
the presence of the horse had the largest effect in knowledge retained (6% increase) compared to the chicken (1% decrease) and pig (6% decrease). The presence of companion animals resulted in an overall 8% decrease in knowledge gain and a 10% increase in knowledge retention (Figures 3a and 3b). All three individual companion animals resulted in a decrease in knowledge gain (cat 16% and dog and cockatiel both at 4%); while all three had a positive effect on knowledge retained (cockatiel 11% and cat and dog both at 9%) (Figure 3c). The presence of exotic animals resulted in a 3% increase in knowledge gain and a 13% increase in knowledge retention (Figures 4a and 4b). Within the category of exotic animals, the presence of the cheetah had the most effect with a 21% increase in knowledge gain compared to the fox with a 2% increase and the penguin with a 6% decrease. However, the presence of the penguin demonstrated the largest effect on knowledge retained (19% increase) while the cheetah had a 9% increase and the fox had an 8% increase (Figure 4c).

One plausible explanation for the results observed in this study is the application of the Yerkes-Dodson Law (1908). This law recognizes the relationship between arousal and behavioral task performance, stating that there is an optimal level of arousal for an optimal performance – over or under arousal will reduce task performance. Level of arousal was measured by student heart rate within the treatment group. The exotic animal category resulted in a significantly higher heart

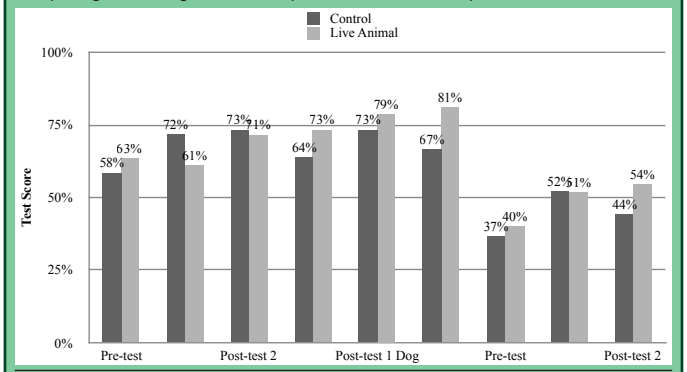
Figure 3. Effect of the presence of companion animals in an educational setting on academic achievement and knowledge retention.



a) Participants (n=19) were randomly assigned into one of two groups: control (no live animal/recorded audio-visual presentations) or treatment (live animal/recorded audio-visual presentations). Half of the participants in each treatment group were randomly selected to complete a knowledge pre-test. The study took place in a controlled classroom environment and agricultural animals were represented by three species for a total of 3 presentations. Each presentation included the same information about the animal such as social structure, diet and life span. At the end of each evening, a knowledge post-test was administered followed by a second post-test one week later. Survey and test data were analyzed with SPSS Statistical Software. Data represent the average test scores across agricultural species.

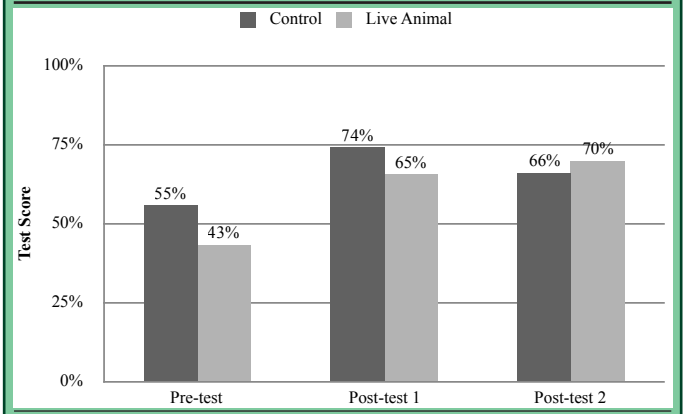


b) Knowledge gained was calculated by comparing the change in pre-test scores to the first post-test scores. Knowledge retention was calculated by comparing the change in the first post-test and second post-test scores.

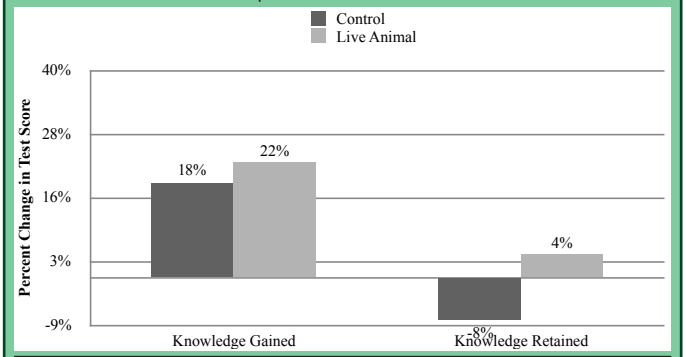


c) Data represent the average test scores for each specie.

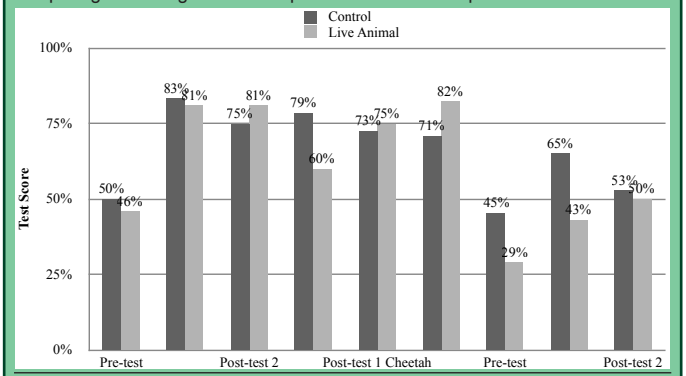
Figure 4. Effect of the presence of exotic animals in an educational setting on academic achievement and knowledge retention.



a) Participants (n=19) were randomly assigned into one of two groups: control (no live animal/recorded audio-visual presentations) or treatment (live animal/recorded audio-visual presentations). Half of the participants in each treatment group were randomly selected to complete a knowledge pre-test. The study took place in a controlled classroom environment and agricultural animals were represented by three species for a total of 3 presentations. Each presentation included the same information about the animal such as social structure, diet and life span. At the end of each evening, a knowledge post-test was administered followed by a second post-test one week later. Survey and test data were analyzed with SPSS Statistical Software. Data represent the average test scores across exotic animal species.



b) Knowledge gained was calculated by comparing the change in pre-test scores to the first post-test scores. Knowledge retention was calculated by comparing the change in the first post-test and second post-test scores.

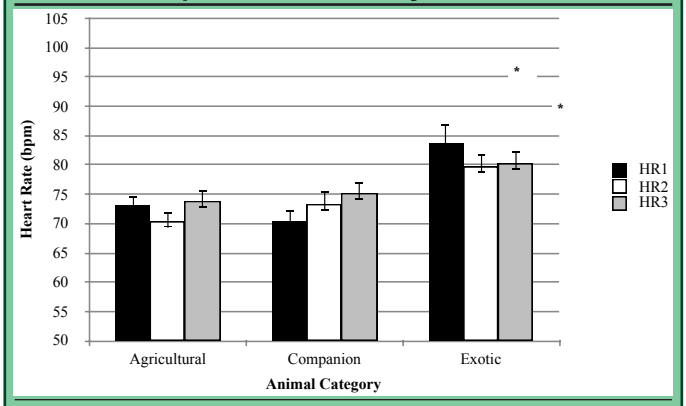


c) Data represent the average test scores for each specie.

rate across all three measurement points (average 81.3 bpm) compared to the agricultural and companion animal categories (average 72.4 bpm and 72.9 bmp, respectively) (Figure 5). Hence, the greater knowledge retention in the exotic animal category (12% increase) versus the 9% increase in the companion animal category and the 0% increase in the agricultural animal category when a live animal is present suggests an association between level of arousal and academic achievement. The increased arousal may be a result of the novelty of the animal being presented. This assessment is based on the self-determined emotional status for each animal presented to the students wearing the heart rate monitors (Figure 6). The emotional options were: fearful, cautious/anxious, uninterested, curious, and excited. None of the participants reported to be uninterested with the exotic animals while 10% and 19% of the students reported to be uninterested with the companion and agricultural animals, respectively. One explanation for students reporting uninterested may be a result of familiarity with the animal being presented, given that

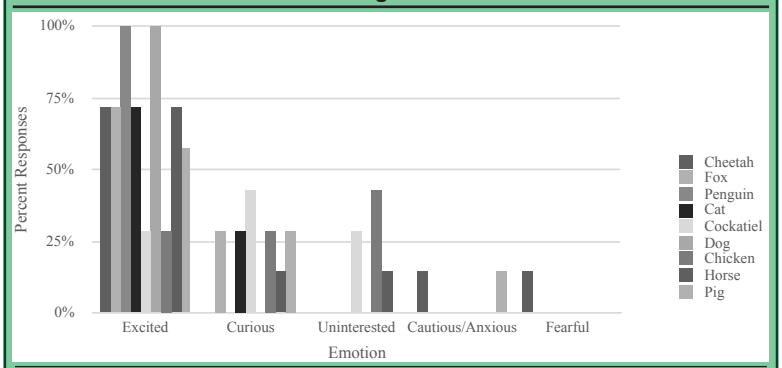
the student population were Animal Sciences majors; however, this is purely speculative since the reason why was not asked during the study.

Figure 5. Effect of the presence of live animals in an educational setting on physiological responses as measured by heart rate.



*Average heart rate (HR) of participants (n=10) during the educational presentations when the animal entered the room (HR1), when the animal moved to a designated location 2 m from the students (HR2), and when the animal left the classroom (HR3). Data were analyzed using PROC GLM.
*P < 0.05 across categories.

Figure 6. Effect of the presence of live animals in an educational setting on emotional state.



An emotion survey was also administered to participants (n=10) to determine the emotion that best described how the participant felt while in the presence of the animal. Survey data were analyzed with SPSS Statistical Software.

Table 4. Changes in participant attitudes towards animals throughout the study period. [a]

	Agricultural Animal Species		Companion Animal Species		Exotic Animal Species	
	Δ PT1	Δ PT2	Δ PT1	Δ PT2	Δ PT1	Δ PT2
	Chicken		**Cat**		**Cheetah**	
Control	-60%	-67%	-31%	-11%	-28%	17%
Treatment	-43%	-43%	29%	14%	86%	71%
% Δ between groups	17%	24%	60%	25%	113%	54%
	Horse		**Cockatiel**		**Fox**	
Control	2%	0%	13%	67%	24%	46%
Treatment	29%	29%	14%	29%	14%	29%
% Δ between groups	27%	29%	1%	-38%	-9%	-17%
	Pig		**Dog**		**Penguin**	
Control	-26%	0%	1%	-6%	11%	17%
Treatment	71%	71%	29%	14%	57%	43%
% Δ between groups	97%	71%	28%	20%	46%	26%
	Combined		**Combined**		**Combined**	
Control	-28%	-22%	-6%	17%	2%	26%
Treatment	19%	19%	24%	19%	52%	48%
% Δ between groups	47%	41%	30%	2%	50%	22%

[a] Δ PT1 represents the percent change in participant responses from the initial survey to the survey administered at post-test 1. Δ PT2 represents the percent change in participant responses from the survey administered at post-test 1 to the survey administered at post-test 2.

Furthermore, study results suggest that in general, the presence of a live animal during an educational interaction increases positive attitudes toward those animals (Table 4). This was strongly demonstrated by the overall (i.e. average of increased attitude post-test (PT1) and retention test (RT) compared to Demographic Survey) increase in positive attitudes toward agricultural (44% increase) and exotic (36% increase) animals after the human-animal interaction. The importance of increased positive attitude towards a species is the potential for increased concern for the well-being of that animal (George et al., 2016). Hence, the implication is that the presence of a live animal during an educational interaction can improve human interest, which may translate to an increased awareness and engagement in decisions related to animal welfare and management.

Summary

The objective of this study was to determine if the presence of a live animal in a post-secondary educational setting affects academic achievement, knowledge retention, and physiological responses. Many studies before have considered one or more of these areas in primary or middle school educational settings; however, to date post-secondary settings have not been thoroughly evaluated. Results of this study suggest that the presence of a live animal has an overall positive effect on academic achievement, knowledge retention, and physiological responses (i.e., engagement). Moreover, the presence of a live animal also has a positive effect on attitudes toward the animal, which may translate into interest in the well-being and management of the animal.

Literature Cited

Allen, K., J. Blascovich and W.B. Mendes. 2002. Cardiovascular reactivity and the presence of pets, friends and spouses: The truth about cats and dogs. Psychosomatic Medicine 64: 727-739.

Breuer, K., P.H. Hemsworth and G.J. Coleman. 2003. The effect of positive or negative handling on the behavioural and physiological responses of nonlactating heifers. Applied Animal Behaviour Science 84: 3-22.

Gee, N.R., E.N. Crist and D.N. Carr. 2010a. Preschool children require fewer instructional prompts to perform memory task in the presence of a dog. Anthrozoos 23: 173-184.

Gee, N.R., M.T. Church and C.L. Altobelli. 2010b. Preschoolers make fewer errors on an object categorization task in the presence of a dog. Anthrozoos 23: 223-230.

George, K.A., K.M. Slagle, R.S. Wilson, S.J. Moeller and J.T. Bruskotter. 2016. Changes in attitudes toward

animals in the United States from 1978 to 2014. Biological Conservation 201: 237-242.

Hemsworth, P.H. 2003. Human-animal interactions in livestock production. Applied Animal Behavior Science 85: 185-198.

Hergovich, A., B. Monshi, G. Semmler and V. Zieglmayer. 2002. The effects of the presence of a dog in the classroom. Anthrozoos 15: 37-50.

Hillman, C.H., S.M. Buck, J.R. Themanson, M.B. Pontifex and D.M. Castelli. 2009. Aerobic fitness and cognitive development: Event-related brain potential and task performance indices of executive control in preadolescent children. Developmental Psychology 45: 114-129.

Hodgson, K., L. Barton, M. Darling, V. Antao, F.A. Kim and A. Monavvari. 2015. Pets' impact on your patients' health: Leveraging benefits and mitigating risk. Journal of the American Board of Family Medicine 28: 526-534.

Hummel E. and C. Randler. 2012. Living animals in the classroom: A meta-analysis on learning outcome and a treatment-control study focusing on knowledge and motivation. Journal of Science Education and Technology 21: 95-105.

Krull, C., J. Suchomel and M. Bechtel. 2015. Effects of animals in post-secondary science classrooms on academic achievement, academic retention, and intrinsic motivation. American Journal of Educational Research 3: 1193-2007.

McCoy, S.K., S. Hutchinson, L. Hawthorne, B.J. Cosley and S.W. Ell. 2014. Is pressure stressful? The impact of pressure on the stress response and category learning. Cognitive, Affective, Behavioral Neuroscience 14: 769-781.

Sherwood, K.P., S.F. Rallis and J. Stone. 1989. Effects of live animals vs. preserved specimens on student learning. Zoo Biology 8: 99-104.

Waiblinger, S., X. Bolvin, V. Petersen, M.V. Tosi, A.M. Janczak, E.K. Visser and R.B. Jones. 2006. Assessing the human-animal relationship in farmed species: A critical review. Applied Animal Behavior Science 101: 185-242.

Yerkes, R.M. and J.D. Dodson. 1908. The relationship of strength of stimulus to rapidity of habit formation. Journal of Comparative Neurology and Psychology 18: 459-482.

Zufliki, I. and A. Siti Nor Azah. 2004. Fear and stress reactions, and the performance of commercial broiler chickens subjected to regular pleasant and unpleasant contacts with human beings. Applied Animal Behavior Science 88: 77-87.

Zulkifli, I. 2013. Review of human-animal interactions and their impact on animal productivity and welfare. Journal of Animal Science and Biotechnology 4: 25.

Sustaining Experiential Education in a University Agriculture Program Using Alternative Funding Sources and Strategic Planning

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Abstract

Post-secondary education funding is multifaceted and varies greatly in the American education system. The desire to include experiential education in collegiate curriculums can be limited by a variety of factors including inefficient management practices and limitations to traditional post-secondary education funding. This paper explores how an equine program at a midsized, university in Kentucky utilized management changes combined with nontraditional funding resources to integrate experiential learning into its curriculum. The intent was to identify management practices and funding sources used by the program. Transcripts from faculty interviews highlighted five themes influencing the program during academic years 2010-2015: improve management procedures, increase herd value, decrease expenses, improve department collaboration, and utilize a more flexible management style. A review of financial records identified four funding sources contributing to experiential learning: two traditional sources (legislative and course fees), and two non-traditional sources (endowments, grants, and sponsorships, and self-generating funds). Findings in this study provide insight to changes in management and alternative funding sources that other equine or agricultural programs could review for potential revenue streams.

Introduction

Murray State University (MSU) is one of eight colleges or universities with an equine program located in Kentucky. The state boasts a $3 billion-dollar equine industry (Kentucky Horse Council, 2013) and is home to the Kentucky Horse Park, Churchill Downs Racetrack, and Keeneland sales complex. Murray State's Equine program draws regional, national, and international students attracted by the state's large equine industry. In contrast to the Kentucky equine industry, the state has at least a 16-year history of budget deficits (Fiscal Budgets, 2018; McNichol and Waxman, 2017). From 2008 to 2015, funding to the Kentucky education system was cut by 32%. Many states faced education funding shortfalls during the Great Recession, but only six states cut more than 32% to per-student funding from pre-2008 levels (Center on Budget and Policy Priorities, 2016). Those shortfalls continued to impact various programs even after the Great Recession. In 2015, the state of Kentucky had the largest annual cut in per-student funding of any state and was spending almost $3,000 less per student than it did in 2008 (Mitchell and Leachman, 2015). The following year, Kentucky's Governor cut post-secondary education funding to balance the state's budget, making 2016 the third consecutive year of reduced funding for post-secondary education. As an early adopter of performance-based funding (PBF), Kentucky passed SB153 in 2017 to continue dispersing funding to Universities using PBF 2.0 model. The decision provided an outcomes-based formula for recipients based on completion-driven indicators of student success. Concerned about reduced funding driven by a PBF model, an agricultural program at a midsized, public university was presented with added expectations to enhance learning for students.

Murray State University places emphasis on experiential learning (EL) in its classrooms. In 2014, MSU instated a Quality Enhancement Plan (QEP) to focus on the importance of experiential learning at its institution. The plan was titled Bring Learning to Life, with the goal of advancing EL objectives. The QEP included the importance of integrating real-world learning environments, professional development, problem solving, critical thinking, and integrative learning into the University setting (Murray State University, 2014). Experiential learning was already occurring in the MSU

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Equine program: riding classes and equine science courses used a University-owned herd. Notably, typical variable expenses covered by the Equine program budget include hay and grain; routine and unexpected medical care; farrier work and dental care; vaccinations; and tack and equipment. The program is not responsible for electricity or water costs, building construction or maintenance, or infrastructure improvements. University funding pays for these expenses, and they do not influence the EL opportunities made possible by the University herd. Experiential learning methodology varies widely between academic programs, and there is no current research placing a generalized cost on implementing EL into traditional courses. This cost ambiguity may negatively influence educators' impression of its value. Amis and Aïssaoui's (2013) study of receptiveness to change in academic institutions emphasized that uncertainty generates resistance. To further advance QEP initiatives without requiring additional legislative funding, MSU equine faculty needed to identify their program's funding methods. Additionally, they believed management changes could improve budget concerns and expand EL. This paper evaluates how the Equine program at MSU financed and managed EL during a period of statewide cuts to tertiary education.

Methods

A historical review of management and budget records studied academic years 2010 to 2015. Annual budget expenditures were evaluated using correlational analysis. This was done to compare the budget before and after a change in management which occurred in 2013. The five-year span also allowed researchers to see if supporting the QEP impacted the Equine program budget. Additionally, interviews were conducted with equine department staff and two student workers involved with the program for clarification on operation and financial decisions. Interviews were recorded and transcribed before evaluation using R (version 3.3.2) to identify themes associated with the individual interviews. For this project, income or revenue included money received on a regular basis. Budget inputs included short-term or temporary funding such as sales or donations. Expense reductions were defined as temporary inputs that could supplement the budget and maintained current levels of program quality. The limitations of this study included the five-year span of reviewed data and incomplete records from that time, specifically a lack of exact financial figures related to expenses concerning equine medical, dental, and farrier care.

Results and Discussion

Historically, agriculture studies have been inherently experiential (Croom, 2008). Experiential learning has evolved but continues as an acknowledged natural and successful place in tertiary education (Baker et al., 2012; Cheek et al., 1994; Etling, 1993; Hughes and Barrick, 1993). Equine, and other agricultural higher education programs vary widely across the country. Likewise, not all institutions have the same entrepreneurial resources to fund, expand, or improve experiential learning for students. Various fundraising opportunities conducted by equine departments in universities and colleges across country have included: youth camps or schools; hosting shows or clinics; dinners with silent auctions; offering seminar space for other equine organizations or continuing education opportunities; and crowdfunding (Burk, A., personal communication). Alternative approaches to funding EL have been studied and can serve as additional examples (Cowart, 2010; Ferek, 2014; Henson, 2010;). While there is extensive literature about post-secondary education funding across the United States, the emphasis has been on institutional funding with very little focusing on experiential education. Programs at MSU have developed different approaches to funding experiential education.

Funding Methods

There are four types of funding that supported equine education at MSU (Table 1). Traditional sources included legislative funding and course fees. Legislative-based funding is allocated by the state to schools based on performance. It can also be referred to as non-discretionary or operational funds and are often found in a university's budget book. This includes capital funds used to purchase and maintain buildings, equipment, and land. Course fees, collected from students for riding courses and classes that included laboratory sections, funded horse care and purchase of supplies used in laboratory sessions. They had been collected for riding classes for many years but were later included in other

Table 1. Four funding sources sustain the Murray State University Equine program. Two are traditional funding sources: legislative funds and course fees. Two are nontraditional funding sources: endowments, grants, and sponsorships, and self-generating funds. Examples of the types of funding are listed in the right column. Those used for Murray State University's Equine Program are labeled with an asterisk.

Traditional Funding sources:	Examples
Legislative Funds: also known as non-discretionary or operational funds; often found in university's budget book	• Student-derived funding from tuition • State or federal appropriated funding
Course Fees	• A flat rate collected for participation in specific courses – i.e. riding classes or courses involving laboratory work*
Nontraditional Funding sources:	**Examples**
Endowments, grants, and sponsorships	• Statewide equine fund collected from industry activities* • Grants for research pursued by faculty or graduate students* • Sponsorships from industry professionals or private citizens to support educational or research needs* • Donations from alumni
Self-generating Funds	• Renting out stalls to current students* • Equine sales* • Utilizing university horses for private lessons during non-school terms (summer semesters)* • Renting out barns or arenas to organizations for seminars or events • Hosting youth camps or continuing education seminars • Dinners with silent auctions

undergraduate courses to support laboratory expenses. Non-traditional sources included self-generating funds and endowments, grants, and sponsorships. Self-generating funds were collected from the use of capital assets, including renting unutilized stalls and sales of superfluous horses. Self-generating funds had been an active part of the program for several decades. Endowments, grants and sponsorships paid for research opportunities. Staff and faculty must competitively seek out these funding sources. The addition of a new faculty member in 2012 increased the use of this funding method, which expanded on EL opportunities for students who became involved in research projects.

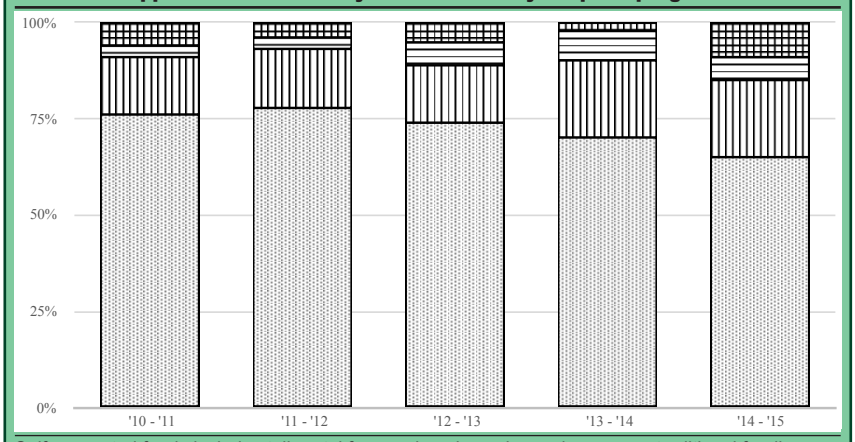
Primary Funding Method. The EL focus of the MSU Equine program was primarily reliant on self-generating funds made possible through the more efficient use of underutilized capital assets (Figure 1). The program utilized approximately 70 acres of land, which were a key component of how the program supported and financed EL. The acreage facilitated grazing for University and student horses; sustained three barns; an Equine Center that included classrooms and an indoor arena; and parking for University students and faculty. The Equine program rented stalls to current students, and most of the EL budget resulted from those stall fees. From at least 2008-2014, stall fees remained the same. In 2014, the fee increased by 12%, which increased the annual budget. This increase was below the economic inflation rate during the same period (http://www.usinflationcalculator.com), which allowed the University to remain competitive in the local horse boarding market. Income collected from student boarding fees created an enterprise budget to support a herd of horses that also relied on the designated acreage and barns. In turn, the University-owned herd provided a unique resource to facilitate the EL principles of the QEP.

Other Funding Sources. The MSU Equine program worked to maximize EL opportunities within budgetary limitations using other budget supplements (Figure 1). Equine course fees were increased in 2013 and largely supported materials needed for expanding of EL opportunities. Horse sales served as a budget input and varied from year to year. The program did not rely on animal sales to support its EL goals, instead returning the funds to a separate account for future training of current horses or purchases of new animals. Faculty also began increasing the use of grant funding and sponsorships in 2012 for the use of research. Student involvement in research was encouraged and expanded on typical EL opportunities available through courses.

Interview Reviews

Faculty in the MSU Equine program expressed the ultimate goal of increasing EL opportunities without sacrificing quality of life for the University-owned herd or increasing costs for the program. This aligned with the QEP established by the University. Reviews of faculty interview transcripts established five themes that supported EL using nontraditional funds: decrease expenses, increase herd value, improved management procedures, department collaboration, and flexibility (Table 2). Some themes were directly addressed by the interviewees, including improving management procedures, increasing herd value, and decreasing expenses associated with the University herd. During interviews, faculty repeatedly described practices that could be summarized as improving department collaboration and utilizing flexibility in management strategizing. These five themes contributed to a strategic planning style by the faculty. Strategic planning involves 'reviewing an organization's strengths, weaknesses, opportunities, and challenges to operate more successfully (Korosec,

Figure 1. Funding sources used to fund experiential learning (EL) opportunities in Murray State University's Equine program.



Self-generated funds include stall rental fees and equine sales and are a non-traditional funding method. Funds from stall rental support horse care and EL opportunities directly. Funds from equine sales were used to enable purchases of new horses for the program or for training of horses already in the program. These animals were then used to support EL in the Equine program. Endowments, grants, and sponsorships are also non-traditional funding sources that were used to support EL at Murray State University. Endowments helped to support both capital funds and EL, while grants and sponsorships helped to fund research as EL in which students could participate. Course fees are a traditional funding method and were collected from students participating in riding courses and those involving lab-based learning and went directly into horse care or EL.

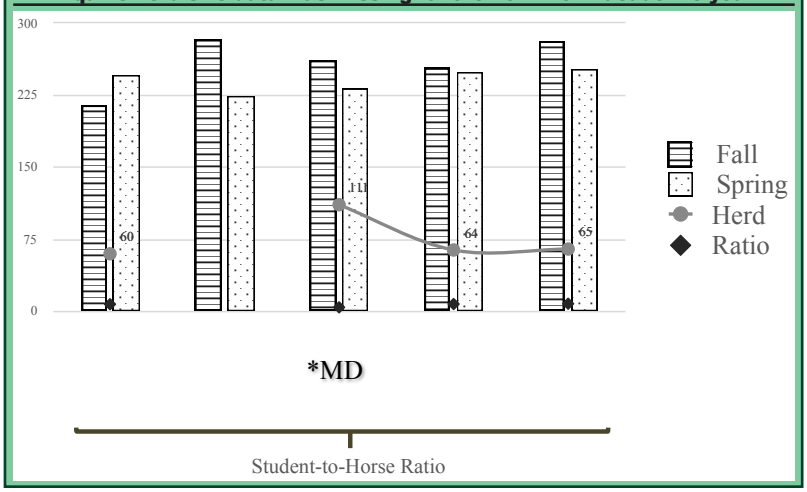
Table 2. Five management themes isolated from key words or concepts expressed during interviews with faculty and student workers. Key words or concepts either had been or could be implemented into program management protocols.

Management theme	Key words or concepts
Improving Management Protocol	• More accurate recordkeeping • Optimization of student worker hours • More economical budget decisions • Increasing animal use
Improving Herd Value	• Reducing total herd size • Improving breeding program • Seeking donations of multi-use, reliable horses
Decreasing Expenses	• Rotational grazing • Reducing total herd size • Negotiate service contracts • Lease out horses over the summer
Department Collaboration	• Rely on colleagues' strengths • Regular meetings and clearly stating expectations • Setting department goals • Sharing obligations and responsibilities • Fundraising as a team
Flexibility and Change	• Trying and evaluating new methods or procedures for management, courses, fundraising, etc.

2006). Specific to this program, strategic planning involved informal reviews by faculty to achieve its ultimate goal.

Decreasing Expenses. Equine program faculty worked to decrease University herd expenses below the self-generated annual budget using capital assets. To that end, Murray State's equine faculty implemented a rotational grazing plan in 2013. However, budget reviews did not show reduced expenses from the initial implementation of the practice from 2013 – 2015. Interviews suggested that rotational grazing was valuable to the program, regardless of the finding, describing fewer weeds, longer growing seasons, and less dependence on grain supplementation to meet nutritional requirements (Conner, A., personal communication). A second approach to reducing expenses resulted in contract negotiations with a different equine feed company leading to lower supplement costs. The Equine program also worked to decrease expenses through herd size reduction. Horses that were not useful to the program were rehomed through approved buyers and reputable auctions reducing expenses associated with maintaining equine welfare by about 21% from 2012 to 2014.

Figure 2. Annual University student enrollment in the Equine program, herd size, and student-to-horse ratios from 2010 to 2015. Decreasing herd numbers after a management change in 2012 increased the student-to-horse ratio, which increased the value of animals in the herd. *Equine herd size data was missing for the 2011-2012 academic year.



Increasing Herd Value. The second theme of improving herd value led to more focused, selective breeding goals and established an appropriate herd size relevant to animal welfare and students' EL. In 2012, the equine herd at MSU peaked at 111 horses (Figure 2). That herd size was above recommended guidelines for pasture management as the MSU facility was located on approximately 70 acres of land (Singer et al., 1999). Concerns at that time included underutilization of horses and increased stress on both financial and land resources. During the same academic year, there was a management change resulting in improved herd management strategies. Management determined, based on funding availability and capital resources, that a herd size of 60-65 horses adequately supported student education (Conner, A., personal communication). Fewer animals increased herd value by increasing student-to-horse touch ratios (Colston C., Conner, A., Robinson S., personal communications). Student-to-horse touch ratio is a measure of how often a student interacts with a horse. Some horses, like those involved with riding courses and teams, have higher ratios. Broodmares, and young horses handled less frequently, have lower ratios, but are still valuable to the program. As a result, student-to-horse ratios were evaluated as a herd average. During peak herd size, student-to-horse ratio was 4.4, compared to 8.2 in 2015 (Figure 2). Increasing student-to-horse ratios increased each animal's value to the University as they became more critical to the program.

Remaining Themes. The final three themes of the MSU Equine program interviews included improving management procedures, department collaboration, and flexibility. The faculty elaborated on management decisions during the 2010-2015 academic years. The MSU Equine program staff had a functional team structure as described by Lafond et al. (2011). In general, the instructors had specialized, complementary roles. Interview responses indicated that faculty and staff collaborated with one other, as well as outside the department, as needed (Colston C., Conner, A., Robinson S., personal communications). Teamwork correlates to positive job satisfaction, increased knowledge transfers between employees, and resource attainment (Weber and Weber, 2010; Yang and Guy, 2011; Maciejovsky et al., 2013). Additionally, cooperative environments encourage more significant involvement by team members (Korosec, 2006; Jung et al., 2010).

Academic institutions have a fragmented organizational structure allowing for natural changes, and, conversely, unique constraints (Amis and Aïssaoui, 2013). Equine faculty hires during the reviewed years led to natural changes in management procedures: improved recordkeeping, optimization of student worker hours, more economical budget decisions, and increased animal use (Colston C., Conner, A., personal communication). The changes led to more economical budget decisions, reducing welfare costs for the University herd. Creating change is a positive, consequential effect of strategic planning (Korosec, 2006). Equine program faculty used flexible management styles to strategically plan for each academic year. Fostering cooperation between organizations facilitates necessary changes to accomplish goals (Amis and Aïssaoui, 2013).

Recommendations: Room for Improvement

Entrepreneurial approaches to funding higher education are not common, as the approach is more closely associated with business models. During the academic years studied, herd size ranged from a low of 60 in 2010 and peaked at 111 in 2012. Student enrollment in the fall semesters ranged from 215 in 2010 to 282 in 2011. Although horse numbers increased in 2012, student enrollment decreased to 261 (Figure 2). Budget inputs

from stall rental and course fees decreased during this time, but expenses did not decrease due to the additional horses. As a result of incomplete management and budget data, it is unknown why herd numbers were increasing as budget inputs were decreasing. For this reason, the Equine program might benefit from adapting more practices normally associated with business, like comprehensive recordkeeping and the development of a business plan. Complete financial records would provide the opportunity to track statistical income and expense data. Business plans can provide a framework for successful goal-focused decision making and funding acquisition (Fernandez-Guerrero et al., 2012; Haag, 2013). Developing goals has been shown to have a positive impact on employee task perception, personal responsibility, and performance (Denis et al., 2011; Jung et al., 2010; Jung, 2012).

The theme of flexibility should be expanded on as research shows that emphasizing end goals and allowing for creativity in reaching those objectives improves outcomes (Woolley, 2009). Faculty goals to increase EL opportunities for students relies on flexibility by educators to transition between formal education, nonformal education, and informal education as opportunities transpire (Etling, 1993). Doing so without negatively impacting equine welfare or increasing costs for the program could be included in a mission statement as part of a business plan. Philosophically viewing the Equine program as a business, working in competition with the seven other equine programs in the state, could encourage staff to develop strategies to be more competitive in the equine education market inside Kentucky. Currently, the MSU Equine program focuses on differentiating their program with EL opportunities in a broad market with two general bachelor's degrees for students to choose from. By identifying their program on a perceptual map against other regional and prominent equine programs, faculty could help develop a competitive strategy to increase enrollment in the program. Increasing enrollment would increase income from course fees and make the program more valuable to the University. Additionally, Equine faculty were unaware that their methods to achieve their ultimate goal could be summarized as strategic planning. Viewing the program as a business could help them recognize their methods compare to successful management strategies appropriate for their situation. Finally, evaluating the on-campus boarding operation with a business approach would be appropriate, as the student boarding stalls were not full during the reviewed years. Price is likely not the issue; board at the University is cheaper than board at other equine facilities in the area. Improving on issues that result in students choosing other locations could make the University more competitive in the local boarding market.

Summary

Kentucky universities face competitive budgeting for post-secondary education. It is important to clarify that Murray State University, the Hutson School of Agriculture, and some aspects of the Equine program are funded by the PBF 2.0 model reestablished in 2017 by the state. Murray State University's Equine program established an alternative source of funding for its EL using an entrepreneurial approach reliant on capital assets. By using underutilized boarding stalls on campus, the Equine program at MSU relied largely on self-generating income opportunities to maintain a University-owned herd. Other nontraditional funding sources and course fees increased EL opportunities to align with the University QEP. Strategic planning by Equine faculty, identified through five themes pulled from interviews, helped sustain EL opportunities. The Equine program appeared to benefit from the ability to make some decisions as a program without interference or direct guidance from the University, although some independent decisions required clearance by the University. Research shows that senior staff support independent strategizing at the departmental level when department employees are professional and knowledgeable (Korosec, 2006). Importantly, the MSU Equine program understood that its goals needed to align with those of the Hutson School of Agriculture. Other agricultural programs, with capital resources available to them, could look to this program as inspiration for entrepreneurial forms of funding. The success of this program's approach to nontraditional funding of experiential learning was reliant on strategic planning that began during the retrospective review.

Literature Cited

Amis, J.M. and R. Aïssaoui. 2013. Readiness for change: An institutional perspective. Journal of Change Management 13(1): 69-95.

Baker, M.A., J.S. Robinson and D.A. Kolb. 2012. Aligning Kolb's Experiential Learning Theory with a Comprehensive Agricultural Education Model. Journal of Agricultural Education 53(4): 1-16.

Center on Budget and Policy Priorities. 2016. Cuts to Kentucky's higher education system jeopardize our economic future. https://www.cbpp.org/sites/default/files/atoms/files/sfp_highered_ky.pdf. Center on Budget Policy Priorities. January 11, 2018.

Cowart, M.R. 2010. Growing and funding experiential education programs: A recipe for success. New Directions for Teaching and Learning 2010(124): 63-68.

Croom, D.B. 2008. The development of the Integrated Three-Component Model of Agricultural Education. Journal of Agricultural Education 49(1): 110-120.

Denis, J.L., G. Dompierre, A. Langley and L. Rouleau. 2011. Escalating indecision: Between reification and strategic ambiguity. Organization Science 22(1): 225-244.

Etling, A. 1993. What is nonformal education? Journal of Agricultural Education 34(4): 72-76.

Ferek, C. 2014. Teacher-initiated program improvements in high school physical education – Part 2. Journal of Physical Education, Recreation, and Dance (85)3: 16-20.

Fernandez-Guerrero, R., L. Revuelto-Taboada and V. Simon-Moya. 2012. The business plan as a project: An evaluation of its predictive capability for business plans. The Service Industries Journal 32(15): 2399-2420.

Fiscal Balance. 2018. Gaps between annual revenue and expenses, in inflation-adjusted dollars. http://www.pewtrusts.org/en/multimedia/data-visualizations/2014/fiscal-50#ind9 The Pew Charitable Trust. January 26, 2018.

Haag, A.B. 2013. Writing a successful business plan. Workplace Health and Safety 61(1): 19-29.

Henson, K.L. 2010. Student projects as a funding source. Journal of Information Systems Education 21(3): 291-298.

Hughes, M. and R.K. Barrick. 1993. A model for agricultural education in public schools. Journal of Agricultural Education 34(3): 59-67.

Jung, C.S. 2012. Why are goals important in the public sector? Exploring the benefits of goal clarity for reducing turnover intention. Journal of Public Administration Research and Theory 24(1): 209-234.

Jung, J.H., C. Schneider and J. Valacich. 2010. Enhancing the motivational affordance of information systems: The effects of real-time performance feedback and goal setting in group collaboration environments. Management Science 56(4): 724-742.

Kentucky Horse Council. 2013. 2012 Kentucky Equine Survey. http://equine.ca.uky.edu/files/2012_equine_survey_report_final_4.pdf University of Kentucky College of Agriculture, Food and Environment. October 20, 2016.

Korosec, R.L. 2006. Is department-based strategic planning more effective than organization-wide strategic planning? Empirical evidence from senior managers. Public Performance and Management Review 30(2): 221-224.

Lafond, D., M.E. Jobidon, C. Aube and S. Tremblay. 2011. Evidence of structure-specific teamwork requirements and implications for team design. Small Group Research 42(5): 507-535.

Maciejovsky, B., M. Sutter, D.V. Budescu and P. Bernau. 2013. Teams make you smarter: How exposure to teams improves individual decisions in probability and reasoning tasks. Management Science 59(6): 1255-1270.

McNichol, E. and S. Waxman. 2017. States faced revenue shortfalls in 2017 despite growing economy. https://www.cbpp.org/sites/default/files/atoms/files/3-30-17sfp.pdf. Center on Budget and Policy Priorities. January 11, 2018.

Mitchell, M. and M. Leachman. 2015. Years of cuts threaten to put college out of reach for more students. www.cbpp.org/research/state-budget-and-tax/years-of-cuts-threaten-to-put-college-out-of-reach-for-more-students. Center on Budget and Policy Priorities. October 25, 2016.

Murray State University. 2014. Quality enhancement plan- bring learning to life. http://murraystate.edu/docs/Strategic-Plan/QualityEnhancementPlan_BringLearningtoLife.pdf Murray State University. October 25, 2016.

Singer, J.W., N. Bobsin, W.J. Bamka and D. Kluchinshi. 1999. Horse pasture management. Journal of Equine Veterinary Science 19(9): 540-545, 585-586, 588-592.

Weber, C. and B. Weber. 2010. Social capital and knowledge relatedness as promoters of organizational performance. International Studies of Management and Organization 40(3): 23-49.

Woolley, A.W. 2009. Means vs. ends: Implications of process and outcome focus for team adaptation and performance. Organization Science 20(3): 500-515.

Yang, S.B. and M.E. Guy. 2011. The effectiveness of self-managed work teams in government organizations. Journal of Business Psychology 26(4): 531-541.

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Secondary Agriculture Science Teachers: Factors Affecting Who Will Stay and Who Will Go

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Abstract

The demand for agriculture teachers far exceeds the supply in the United States. When teacher retention is low and school districts cannot find qualified applicants to replace them, the decision is often made to close the program and absorb the budget elsewhere or hire an unqualified teacher to fill a vacant position. This study identified the factors current agriculture teachers use when they have considered leaving the teaching profession and assessed if differences existed between traditional versus alternatively certified teachers. Of the 114 agriculture teachers that responded to the survey, 78.1% indicated that they had seriously considered leaving the teaching profession. Many stated that they had considered employment in agriculture business, other educational content areas, or production farming. There were no statistically significant differences between traditionally and alternatively certified teachers when considering leaving the teaching profession, but some practical differences existed. Traditionally certified teachers agreed that the amount of stress related to the job was one of the reasons when considering leaving the profession. Interestingly, alternatively certified teachers indicated that it was low salary.

Introduction

In 2016, the United States Department of Labor predicted that there would be a labor shortage for skilled workers in industries such as construction and manufacturing including jobs in the areas of electricians, plumbers, welders, agriculturalists, and others (United States Department of Labor, 2016). Even though this prediction is reality, public school systems and state education agencies still tend to put emphasis on Science, Technology, Engineering, and Mathematics (STEM) education, preparing all students to attend college, and standardized testing (National Council of Teachers of English, 2014). High stakes testing still takes the forefront in public education, but public leaders and school administrators are beginning to realize not every student will attend or needs to attend college to be a contributing citizen. Career and technology programs, such as agricultural education at the secondary level have gained interest from administrators and community members for these reasons (Rojewski, 2002). Laborers, tradespeople, and apprentices are needed in society to create and maintain the infrastructure that is currently in place. Agricultural education and similar programs in and out of the public school system is where these future workers begin their training to contribute to society. Many of the students enrolled in agricultural education programs will carry their skills forward to society earning a considerable salary, sometimes very close to that of a college graduate (Miller, 2017). If passionate and qualified agriculture teachers decide to leave the classroom, this training will diminish.

Today, the agricultural education discipline is facing a challenge that is not new to the education world. The demand for agriculture teachers far exceeds the supply. As of 2016, states reported that there were 7,775 agricultural education programs in the public school setting employing roughly 11,557 teachers (Smith et al., 2016). Of those 11,557 teachers, it was reported that 721 of them would not return to the classroom in the 2016-2017 school year. The top reported reasons for leaving the profession included retirement (201), becoming employed in business/industry (112), not offered a contract/terminated (81), becoming employed in another educational content area, and becoming employed in production agriculture (51). Smith et al. (2016) also indicated that states reported 772 graduates completed teacher licensure programs in 2016 and only 569 were planning to teach. To fill the demand, public school officials have resorted to filling the open positions with alternatively certified candidates. According to the

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United States Department of Education, National Center for Education Statistics (NCES, 2012), roughly 3.38 million teachers were employed in public school systems in 2011-2012 with 14.6% of them receiving certification through an alternative certification route. Alternative certification routes to teaching are offered in most states and allow a person who has not completed the education coursework to become an educator. Typically, candidates must hold a bachelor's degree in the discipline in which he/she wants to teach, then enter the classroom through initial employment, and concurrently complete the required post-secondary education coursework through means deemed appropriate by the state. Some of the coursework options include night courses, graduate school, online courses, or a combination of these.

Many researchers argue that alternatively certified teachers are less prepared than traditionally certified teachers (Darling-Hammond et al., 2002; Zientek, 2007). Alternatively, certified teachers tend to receive their preservice pedagogical coursework while already in the classroom and receive no student teaching training (Constantine et al., 2009; Humphrey and Wechsler, 2007). In addition to pedagogical competencies, agricultural education teachers have an enormous amount of time commitment with extracurricular activities present in the FFA program. Duncan and Ricketts (2008) found that some of these activities include training Career Development Teams (CDE) teams, recordkeeping, coordinating Supervised Agriculture Experiences (SAEs), stock shows, and FFA fundraising to name a few. The researchers compared traditionally and alternatively certified teachers on this construct and found that traditionally certified teachers had significantly higher self-efficacy levels than alternatively certified teachers. Contrasting this assumption, Roberts and Dyer (2004) found that there was no significant difference for in-service needs between traditionally and alternatively certified teachers, in fact, traditionally certified teachers indicated greater in-service needs in four of the five constructs the researchers examined.

Beginning agriculture teachers claim one of the major problems that they feel they face is the lack of knowledge in the different subject areas and low self-efficacy levels to deliver the material (Myers et al., 2005; Paulsen et al., 2015). For agriculture teachers who have been teaching longer than three years, the researchers found that lack of administrative support, handling student discipline problems, and low student motivation to be leading causes for leaving the profession (Boone and Boone, 2009). Understanding the reasons behind agriculture teachers considering leaving the profession and if there is a difference between traditionally and alternatively certified teachers is important to agricultural education due to the low supply and high demand dynamics of the profession happening today. The purpose of this study was to explore the reasons why agriculture teachers have recently considered leaving the profession.

Materials and Methods

The study was conducted quantitatively using a descriptive research design to assess if traditionally certified teachers had different reasons for considering leaving the teaching profession than alternatively certified teachers did. The target population for this study consisted of Texas agriculture teachers. There were 2,129 agriculture teachers in Texas during the 2016-2017 school year according to the Vocational Agriculture Teachers Association of Texas (VATAT) directory. It was determined that an appropriate sample size (Krejie and Morgan, 1970) from the population to make generalizations was 330 randomly selected teachers. Texas FFA is divided into ten geographical FFA regions within the state and the researchers wanted to ensure an equal representation of agriculture teachers from each region. The researchers used the proportional stratified random sampling approach to randomly select participants to accurately represent the percentage of teachers within each respective location to equal the recommended sample size n=330.

A survey was developed to address the reasons why current agriculture teachers had considered leaving the profession. The Texas State University Institutional Review Board approved the study protocol and survey and it was deemed exempt. From a thorough literature search, 16 factors were presented to the teachers and they were asked their level of agreement based on a five point Likert scale with 1=strongly disagree and 5=strongly agree. The reliability and validity of the survey was based on a panel of experts in the agriculture teacher education field and a pilot test of 25 Texas agriculture teachers. The survey was distributed to a panel of experts consisting of three current professors at Texas State University - San Marcos within the agriculture and occupational education department. Thirteen agricultural education student teachers and graduate students reviewed the survey for wording and grammatical errors. Cronbach's coefficient α was calculated to test internal consistency of the instrument. The reliability scale relating to how various aspects of teaching agriculture affected the consideration to leave instrument was α=0.89. After the survey was deemed valid and reliable, it was distributed via email using Qualtrics survey software. Two weeks after the initial survey distribution, a reminder email was sent to the non-responders. A total of four reminders were completed before the close of the survey. Each responding participants' name was put in to a drawing for one of two $100 Visa gift cards at the end of data collection. Data analysis was conducted using IBM SPSS Statistics for Windows, Version 24.0. Descriptive statistics of the agriculture teachers, along with frequencies, percentages, measures of central tendency, and variability were all used to fully describe the data.

Results and Discussion

Of the teachers that responded (n=114), 63 were male and 51 were female. Ninety-five (83.3%) of the participants had gained teacher certification through a traditional teacher certification method while 19 (16.7%) went through an alternative method. Upon asking whether the teachers had ever considered leaving the agriculture teaching profession, 89 (78.1%) indicated they had considered leaving the profession at some point and 25 (21.9%) had not ever considered it. For those who indicated they had considered leaving the profession, they indicated that the top reason for considering leaving was to pursue employment in the agriculture business/industry (n=44; 38.6%), while 13 (11.4%) teachers had considered retirement and 12 (10.5%) considered gaining employment in another educational content area (outside of agricultural education). Twenty-nine (25.4%) agriculture teachers selected the option of other and indicated that they were considering leaving due to lack of support from administration and the school, too much stress for little pay, and other career choices, such as administration, self-employment, or another direction. Additional reasons for considering leaving the teaching profession can be found in Table 1.

Only the 89 respondents who had indicated considering leaving the profession were asked to respond to a series of statements addressing the factors related to their consideration and asked to rate them using a five-point Likert-type scale. The means and standard deviations of the factors for considering leaving the profession for both traditionally certified and alternatively certified teachers are presented in Table 2. Traditionally certified teachers (M=3.86) and alternatively certified teachers (M=4.00) both agreed that stress was a factor for considering leaving the teaching profession. Alternatively, certified teachers agreed that one of the reasons for considering leaving the teaching profession was low salary (M=4.07). Traditionally certified teachers slightly agreed excessive paperwork (M=3.68), lack of administration support (M=3.61), and lack of recognition from administration (M=3.57) were factors when considering leaving the profession. Alternatively, certified teachers had similar means as the traditionally certified teachers on these three factors. Time management and multiple class preps were two factors that had a slight variance in how the two groups agreed. Traditionally certified teachers felt that time management (M=3.46) was somewhat of a factor when considering leaving the profession while alternatively certified teachers (M=4.00) agreed that is was an important factor when considering leaving. The number of classroom preparations each group of teachers had each day had minimal effects on the consideration to leave the profession, although alternatively certified teachers (M=3.80) were somewhat higher in agreeance levels than traditionally certified teachers (M=3.24).

Table 1. Secondary Agriculture Teachers' Reasons for Considering Leaving the Teaching Profession

Reasons	n	(%)
Employment in the agriculture business/industry	44	38.6
Other (i.e.) stress, low salary, lack of administration support	29	25.4
Retirement	13	11.4
Employment in another educational content area (outside of agriculture)	12	10.5
Employment in production agriculture/farming	10	8.8
Employment in post-secondary education	9	7.9
Continuing education/graduate school	8	7.0
Stay at home parent/caregiver	7	6.1
Considered moving out of state	4	3.5
Health	2	1.8
Not offered a contract/terminated	1	0.9

Table 2. Reported Factors for Both Traditionally and Alternatively Certified Secondary Agriculture Teachers Cited as Considerations for Leaving the Teaching Profession

Factors	Traditional Teacher Certification (n= 71)		Alternative Teacher Certification[y] (n= 15)	
	M	SD	M	SD
Too much stress	3.86[z]	1.16	4.00	0.93
Excessive paperwork	3.68	1.17	3.67	1.23
Lack of administration support	3.61	1.25	3.20	1.27
Lack of recognition from administration	3.57	1.35	3.67	1.29
Low salary	3.56	1.25	4.07	0.88
Time management	3.46	1.27	4.00	0.88
Lack of proper funding for FFA	3.41	1.24	2.71	1.44
Multiple class preps	3.24	1.20	3.80	1.15
Lack of advancement in the profession	3.11	1.23	3.07	0.96
Parent conflict	3.11	1.30	2.73	0.88
Work conflicting with family	3.04	1.45	3.50	1.45
Lack of recognition from community	2.93	1.25	2.80	1.27
Family conflicting with work	2.54	1.33	3.21	1.58
Lack of classroom management	2.38	1.16	2.86	0.95
Lack of extended contract	2.36	1.08	2.00	1.04
Low career commitment	2.04	1.04	2.29	1.07

[y]Teacher certification completed in ways other than that of a traditional University program.

[z] Likert scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

An independent samples t-test was used to determine if statistically significant differences existed between the perceptions of traditionally certified teachers and alternatively certified teachers on the factors that contributed to their consideration to leave the profession. After analyzing each of the factors, it was found that no statistically significant differences ($p>0.05$) existed between traditionally and alternatively certified teachers. Although statistical differences were not present, it is practical to hypothesize the factors that had the largest gaps between the means of the two groups and the potential reasons why.

Discussion and Conclusion

The study sought to determine the reasons current agriculture teachers had considered leaving the profession. The majority (78.1%) of the agriculture teachers that were surveyed had considered leaving the agriculture teaching profession at some point. This study concurs with the previous research and indicates that a high percentage of the agriculture teachers had considered leaving the profession due to alternative job opportunities linked to a higher salary, too much stress, work/life balance, and lack of support (Grissmer and Kirby, 1987; Boone and Boone, 2009; Cano and Miller, 1992; Murray et al., 2011; Chenevey et al., 2008)

This study found that both traditionally and alternatively certified agriculture teachers agreed that they considered leaving the profession due stress level associated with the job. The traditional certified teachers' agreement (M=3.86) was slightly lower than that of the alternatively certified teachers (M=4.00). Too much stress could be attributed to the high stakes testing mechanisms present in public school systems that make teachers think that if their students do not have high test scores then the school district would dismiss them (von der Embse et al., 2017). In many cases this creates a "teach to the test" mentality, thus eliminating quality contact hours teaching what is supposed to be taught in the agricultural education course. With a well-rounded agriculture program comes the many activities the agriculture teachers must manage: FFA, fundraisers, stock shows, judging contests and many more (Lemons et al., 2015). With so many moving parts to a quality program, many teachers indicate that there are just not enough hours in the day to juggle all of them, thus increasing stress levels and a strong consideration to leave the profession. Alternatively, certified teachers indicated that low salary (M=4.07) was a factor that was high on the list when they considered leaving the profession. This could be attributed to those teachers entering the profession not knowing the expectations of the discipline. The teachers who had high paying jobs left their jobs due to high stress and travel commitment. They may have realized that salary is not everything and made the transition to the teaching field, thus later finding out that the expectations and time commitment are as high in the agriculture teaching field as they were in industry.

Time management and having multiple class preps were both factors that alternatively certified teachers rated high as a considering factor to leave the profession. Alternatively, certified teachers may not realize that the number of class preps for agriculture teachers is typically higher than that of regular teachers due to agriculture having many sub disciplines, such horticulture, animal science, and agriculture mechanics (Lemons et al., 2015). Time management issues begin to factor in when adding in all the extracurricular activities that an agriculture teacher is responsible for: FFA, stock shows, alumni, judging teams, etc. Many alternatively certified teachers may not have an FFA or 4-H background and get in to agriculture teaching not understanding the extra time commitments. Many other researchers have found similar results in that multiple class preparations, time management, and paper work were some of the major problems current and beginning agriculture teachers have experienced (Bennett et al., 2004; Croom, 2003; Edwards and Briers, 2001; Gilman et al., 2012; James, 2013).

Public school administrators, career and technology directors, teacher educators, state directors and educational service center directors should understand the factors that contribute to the consideration to leave the agriculture teaching profession and provide professional development training in that area. They should get to know the current teachers and discover their certification method and background. The factors may differ between traditionally and alternatively certified teachers due to previous agriculture and FFA experience. Dealing with stress, time management, and working with administration are often topics that are overlooked in teacher preparation programs, both traditional and alternative, and could be addressed by formal mentoring programs consisting of seasoned agriculture teachers. In conjunction with these formal mentoring programs could be extensive professional development at annual conferences and in-service training covering these factors that might lead to a decreased consideration to leave the agriculture teaching profession.

Literature Cited

Bennett, P.N., M.J. Iverson, F.R. Rohs, C.A. Langone and M.C. Edwards. 2004. Job satisfaction of agriculture teachers in Georgia and selected variables indicating their risk of leaving the teaching profession. American Association for Agricultural Education.

Boone, H.N. and D.A. Boone. 2009. Problems faced by high school agricultural education teachers. Journal of Agricultural Education 48(2): 36-45.

Cano, J. and G. Miller. 1992. A gender analysis of job satisfaction, job satisfier factors, and job dissatisfier factors of agricultural education teachers. Journal of Agricultural Education 33(3): 40-46.

Chenevey, J.L., J.C. Ewing and M.S. Whittington. 2008. Teacher burnout and job satisfaction among agricultural education teachers. Journal of Agricultural Education 49(3): 12-22.

Constantine, J., D. Player, T. Silva, K. Hallgren, M. Grider, J. Deke and E. Warner. 2009. An evaluation of teachers trained through different routes to certification: Final report. United States Department of Education: National Center for Education Evaluation and Regional Assistance.

Croom, D.B. 2003. Teacher burnout in agricultural education. Journal of Agricultural Education 44(2): 1-13.

Darling-Hammond, L., R. Chung and F. Frelow. 2002. Variation in teacher preparation: How well do different pathways prepare teachers to teach?. Journal of Teacher Education 53(4): 286-302.

Duncan, D.W. and J.C. Ricketts. 2008. Total program efficacy: A comparison of traditionally and alternatively certified agriculture teachers. Journal of Agricultural Education 49(4): 38-46.

Edwards, M.C. and G.E. Briers. 2001. Selected variables related to expected longevity in teaching of entry-phase agriculture teachers. Journal of Career and Technical Education 18(1): 7-18.

Gilman, D., J.B. Peake and B. Parr. 2012. A gender analysis of job satisfaction levels of agricultural education teachers in Georgia. Journal of Career and Technical Education 27(2): 98-113.

Grissmer, D. and S. Kirby. 1987. Teacher attrition: The uphill climb to staff the nation's schools. Santa Monica, CA: Rand Corporation.

Humphrey, D.C. and M.E. Wechsler. 2007. Insights into alternative certification: Initial findings from a national study. Teachers College Record 109: 483-530.

James, E. 2013. Importance of factors considered by Ohio secondary agricultural education teachers in their decision to remain in teaching. https://etd.ohiolink.edu/ (Electronic Thesis or Dissertation).

Krejie, R.V. and D.W. Morgan. 1970. Determining sample size for research activities. Educational and Psychological Measurement 30: 607-610.

Lemons, L.L., M.T. Brashears, S. Burris, C. Meyers and M.A. Price. 2015. Factors contributing to attrition as reported by leavers of secondary agriculture programs. Journal of Agricultural Education 56(4): 17-30.

Miller, S. 2017. Starting salaries for 2017 college grads hit all-time high. Society for Human Resource Management.

Murray, K., J. Flowers, B. Croom and B. Wilson. 2011. The agricultural teacher's struggle for balance between career and family. Journal of Agricultural Education 52(2): 107-117.

Myers, B.E., J.E. Dyer and S.G. Washburn. 2005. Problems facing beginning agriculture teachers. Journal of Agricultural Education 46(3): 47-55.

National Center for Education Statistics. 2012. United States Department of Education. Public School Teacher Data File, 2011-2012.

National Council of Teachers of English. 2014. How standardized tests shape and limit student learning: A policy research brief.

Paulsen, T.H., R.G. Anderson and J.F. Tweeten. 2015. Concerns expressed by agricultural education preservice teachers in a twitter-based electronic community of practice. Journal of Agricultural Education 56(3): 210-226.

Roberts, T.G. and J.E. Dyer. 2004. Characteristics of effective agriculture teachers. Journal of Agricultural Education 45(4): 82-95.

Rojewski, J. 2002. Preparing the workforce of tomorrow: A conceptual framework for career and technical education. Journal of Vocational Education Research 1: 7-35.

Smith, A.R., R.G. Lawver and D.D. Foster. 2016. National Agricultural Education Supply and Demand Study.

United States Department of Labor: Bureau of Labor Statistics. 2016. Exploring differences in labor market activity.

Von de Embse, N.P., A.M. Schoemann, S.P. Kilgus, M. Wicoff, M. Bowler. 2017. The influence of test-based accountability policies on teacher stress and instructional practices: A moderated mediation model. Educational Psychology 37(3): 312-331.

Zientek, L.R. 2007. Preparing high quality teachers: Views from the classroom. American Educational Research Journal 44(4): 959-1001.

Student Perceptions of Trans-Institutional Cooperative Learning in an Animal Science Course

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Abstract

The use of cooperative learning in STEM disciplines has been linked to increased student achievement and performance. Faculty at two Midwestern Land-grant Universities collaboratively developed the Advanced Animal Systems Management course. The course was designed to facilitate interaction among students at both institutions through shared course lectures/discussions, cooperative peer review of work, and a joint field experience. The objective of this study was to determine students' perceptions of trans-institutional cooperative learning on meeting the overall course goals and desired learning outcomes. Pre- and post-questionnaires were developed and administered during the first and last week of class to 11 students at Institution 1 and 9 students at Institution 2 (100% response rate). Student enthusiasm was high, with all students agreeing that they were interested in the course content area. Most students felt that the collaboration would be beneficial to the learning experience. At the end of the semester, most students did not think that the trans-institutional cooperative learning increased their understanding of course materials or helped their learning of concepts and principles. Additional learning activities are needed in future course offerings to foster more engagement and interaction of students.

Introduction

The number of undergraduate students enrolling in Animal Science baccalaureate degree programs without previous experience with agricultural animals continues to increase at land-grant universities. This trend is not unique to the institutions in this study and is reflected across other Animal Science departments (Buchanan, 2008; Parrish et al., 2015). Students entering the agricultural workforce should be able to identify, understand, and articulate critical issues facing the industry. Educational pedagogies should be used to help students develop these competencies. Active learning is one instructional approach that promotes student engagement in the learning process.

Active learning is defined as the use of instructional activities that involve students in doing things and reflecting on course activities (Bonwell and Eison, 1991). These activities can include writing, reading, reflecting, talking, and listening. Students in courses utilizing active learning, typically out-perform students learning in more passive environments (Qualters, 2001) and active learning strategies increase student performance in science, engineering, and mathematics compared with traditional lecture format (Freeman et al., 2014). Utilizing active learning strategies (i.e., individual activities, paired activities, informal small groups and large group activities) in an Introduction to Equine Science course resulted in improved student performance, increased critical thinking, and positive student perception of the course (Mortensen and Nicholson, 2015).

One category of active learning strategies is the use of cooperative learning (Knobloch, 2015). Cooperative learning is the instructional use of small groups that allow students to work together to maximize their learning as well as each other's learning. Active participation in team-based learning has a positive relationship with

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Table 1. Course Topics

Week	Topic	Assignment	Cooperative Learning
1	Introduction to Extension	Review of Extension fact sheets	
2	Introduction to Beef Cows in Confinement	Fact Sheet Topic #1: Feeding by group, feed availability, and calving	Topic and group assignments
3	Systems Approach to Farm Management	Fact Sheet Topic #2: Nutrition and reproduction	Teams work on first draft of Fact Sheet #1; Presentation and discussion on Fact Sheet #1
4	Basic Facility Design	Draft of Fact Sheet Topic #1 Due	Teams work on first draft of fact sheet #2, peer-review of fact sheet
5	How to Critically Reflect on Course Field Trip	Brainstorm goals and objectives of field trip	Teams brainstorm goals and all participate in overnight field trip.
6	Field Trip Discussion	Draft of Fact Sheet Topic #2 Due	Teams discuss their critical reflections of the field trip experience, peer-review of fact sheet; Presentation and discussion on Fact Sheet #1
7	Topic Review	Field Trip Critical Reflection Paper	Time for teams to work together on Fact Sheets.
8	Topic Review	Fact Sheet Topic #3: Facilities	Teams work on first draft of fact sheet #3
9	Newborn Calves and visit to University Beef Units	Fact Sheet Topic #3: Facilities	
10	Biosecurity and Health	Fact Sheet Topic #3: Facilities	Presentation and discussion on Fact Sheet Topic #3
11	Waste Management	Draft of Fact Sheet Topic #3 Due	Peer-review of Fact Sheet Topic #3
12	Facility Planning	Final Fact Sheet	Teams work on Final Fact Sheet and presentation
13	Permitting Process	Final Fact Sheet	Teams work on Final Fact Sheet and presentation
14	Topic Review	Final Fact Sheet	Presentations and discussion on final Fact Sheet and presentation
15	No Class		

the student's academic performance (Tsay and Brady, 2010). Cooperative learning in the classroom is linked to higher achievement, greater long-term retention of course material, and more frequent use of critical thinking skills (Johnson et al., 2007). Incorporating a team term project into the curriculum in an introductory food science course resulted in a high percentage of students using higher-level cognitive skills and group coordination skills (Murano and Knight, 1999). Students in this course also suggested the team project increased their comprehension of course material.

Across animal science curricula, many institutions offer capstone courses in farm evaluation to provide problem-based learning opportunities to students and provide a transition from academia into industry. These advanced courses in farm evaluation are intended to further develop essential critical thinking and synthesizing skills in the program's graduates. However, stakeholders often cite that graduating animal science students are still not able to "put the pieces" together and integrate all components of animal management to provide recommendations for animal producers (Karcher, personal communication). Based on this feedback, the Advanced Animal Systems Management course was created and offered to students at Institution 1 and Institution 2. Students in the class utilized cooperative learning within their institution, as well as with students at the other institution, as a key instructional pedagogy.

To date, there is limited literature on trans-institutional learning. Therefore, the objective of this study was to explore and describe college students' perceptions of trans-institutional cooperative learning experience regarding achieving overall course goals and desired learning outcomes. We hypothesized that students would have a positive perception of the cooperative learning experience between Institution 1 and Institution 2, because they would be engaged in discussing and applying the key concepts, both within and between the two course sites.

Methods

Course Development and Implementation

Recognizing a need to provide animal science students with additional opportunities to synthesize information and make informed management decisions, Institution 1 and Institution 2 offered for the first time in Spring 2017, the Advanced Animal Systems Management course. This course was offered as two credits and had the following course objectives: 1) identify and describe the current issues related to animal management; 2) compare and contrast management goals and practices that promote efficient and profitable production; 3) develop skills to evaluate farm management practices; 4) use spoken language and active learning to communicate ideas and information; and, 5) work with others and in teams to enhance learning of class material. The course met on each campus two times per week. One time per week, each school met independently for a recitation period and the other time, the schools shared the classroom using Zoom video conferencing (Zoom Video Communications, Inc., San Jose, CA). Table 1 describes the course schedule. Lectures from a given institution were blocked by topic, with most of the lectures occurring on Institution 1's campus.

At the start of the semester, 11 animal science students were enrolled in the course at Institution 1 and 9 at Institution 2. All students were junior or senior classification and had previously taken at least one animal management course. Two students from Institution 2 dropped the course near the beginning of the semester. Students from each school were divided into three teams (two to four students/team). The goal of the course is to select a different species each time it is offered. At each offering, a current industry issue is selected at the start of the semester. During the semester the data was collected, beef cows in confinement was identified as a current issue. Teams were selected based on previous beef experience, previous animal science courses, and extracurricular experiences completed in animal science. There was a minimum of one student on each team who had previously completed a beef manage-

ment course. Three scenarios were described and a team from each institution was assigned to one of the three scenarios. The topics, assignments, presentations, and discussions throughout the semester were designed to assist teams in creating an Extension fact sheet based on the team's assigned scenario.

Trans-Institutional Cooperative Learning

In addition to the weekly Zoom sessions, assignments and activities were designed to facilitate interaction between students at both institutions. Throughout the 15-week semester, teams worked on building their final fact sheet by working on various topics surrounding their scenarios. Topics ranged from nutrition and grouping strategies to reproduction and facilities. Drafts for each group of topics were turned in by each team and then shared with peers from the other school's team with the same scenario. Teams then had one week to peer-review the draft sheets and provide feedback.

During week six of the semester, students from both schools participated in an overnight field trip. Schools met Friday evening in central Indiana and had casual discussion over dinner. On Saturday, students visited with two producers maintaining their beef cows in confinement. This experience not only provided students with an authentic learning environment and direct application of the assigned scenarios but allowed students from both schools to interact and socialize. This type of environment was designed to create discussion and increase social engagement among the group. The field trip allowed students to better visualize facilities designed to house confined beef cows and to speak first-hand with producers to ask why they selected the particular management practice. Group discussion was utilized throughout the field trip and students participated in social activities to encourage interaction. A Facebook page was created after the field trip to further facilitate interaction between students. Google Docs was also utilized as virtual space for groups to share information.

Questionnaire Design

The survey and experimental design were approved by the Purdue University Institutional Review Board. A pre-questionnaire was created and administered the first day of the class. The questionnaire consisted of 10 items, including demographic variables and evaluation of the student perceptions of the cooperative learning benefits. Students' responses were evaluated using a Likert scale (1–strongly disagree, 2–disagree, 3–somewhat disagree, 4–somewhat agree, 5–agree, and 6–strongly agree). The survey was administered in class (100% response rate). A post-questionnaire was administered to students the last day of class (100% response rate) and included similar items as the pre-questionnaire and presented in a Likert-scale format. Additionally, Small Group Instructional Diagnosis (SGID) sessions were conducted halfway through the course and again at the end by members of Institution 1's Center of Instructional Excellence. These sessions provided course feedback and further input on the course collaborative approach.

Statistical Analysis

Cronbach's alpha was used to determine the reliability of the questions in the questionnaire, where an alpha coefficient of 0.8 and greater was considered robust. The Mann Whitney U Test was used to determine differences in survey results between and within institutions (significance declared at $P<0.05$ and tendency at $P=0.05$-0.10). Cohen's effect size was used to evaluate differences between pre- and post-survey responses within institution where a 0.2-0.5 was considered small, 0.5-0.8 was considered moderate and 0.8 and greater was considered a strong effect.

Results

Student Demographic Description

Demographic information is presented in Table 2. Of the 11 students enrolled at Institution 1, 90.9% were female and 9.1% were male. All of Institution 1 students were seniors at the time of the course. At the beginning of the semester, 9 students were enrolled at Institution 2 with 44.4% females and 55.6% male. Twenty-two percent of Institution 2 students were of junior classification and 77.8% seniors. Two students, one male (junior) and one female (senior), dropped the course at Institution 2 during weeks 2 and 3 of the semester, respectively. At the start of the semester, 60% of the students identified their hometown community as rural (farm), 35% rural (non-farm), and 5% suburban. None of the students had previous experience with a course collaboration between institutions.

The primary goals and expectations of the course identified by the students, included gaining more farm industry experience, increasing critical thinking skills, understanding challenges faced by livestock producers, and experience collaboration with others using knowledge gained to solve real-world problems.

Table 2. Demographics of twenty students enrolled in an Advanced Animal Systems Management course.

	Institution 1		Institution 2		Total	
	Number	Percent	Number	Percent	Number	Percent
Gender (Number/%)						
Male	1	9.1	5	55.6	6	30.0
Female	10	90.9	4	44.4	14	70.0
Classifications						
Junior	0	0.0	2	22.2	2	10.0
Senior	11	100	7	77.8	18	90.0
Hometown						
Rural, did not grow up on a farm	3	27.3	4	44.4	7	35.0
Rural, did grow up on a farm	7	63.6	5	55.6	12	60.0
Suburban	1	9.10	0	0.0	1	5.0
Urban	0	0.0	0	0.0	0	0.0

Pre-Questionnaire and Mid-Semester Student Feedback

Pre-questionnaire results are summarized in Table 3. The pre-questionnaire items were reliable (pre-test alpha =0.88). The results did not differ between institutions (P=0.33), indicating that students had similar expectations for the cooperative learning process. A moderate effect size was found for the pre-test between institutions (Cohen's D=0.76). Results of the pre-questionnaire indicated that students were very interested in course content with 100% of respondents answering somewhat agree, agree, or strongly agree. Students felt positive about the trans-institutional cooperation and all students expected the collaboration to be a worthwhile part of the course. Students also felt that the collaboration would increase their overall learning in the course, help them think differently about course material, and assist in learning of course concepts and principles (100% responding somewhat agree, agree, or strongly agree).

During week seven of the semester a SGID was conducted. This provided students the opportunity to give formative feedback on the course and the role of the collaboration. Collaboration with the other university and access to multiple faculty members with diverse expertise was cited by students as assisting in the learning process. Students also appreciated the authentic problems they were challenged with and felt the coursework was applicable to livestock producers. The small classroom size also allowed for group discussions and students felt they were challenged to use critical thinking skills.

Post-Questionnaire and End of Semester Student Feedback

Post-questionnaire results are summarized in Table 4. The post-questionnaire items were reliable (post-test alpha=0.95). A moderate effect size was found for the post-test between institutions (Cohen's D=0.59). There was a tendency for differences in post-questionnaire items between institutions (P=0.10).

Within institutions, there was a difference between the pre- and post-questionnaire responses (P<0.001, for both). There was also a large effect size at both institutions (Cohen's effect size=2.52 for Institution 1 and 1.83 for Institution 2). Overall, only 27.3% of Institution 1 students and 44.5% of Institution 2 students felt that trans-institutional collaboration was a worthwhile part of the course (responding somewhat agree or agree). Most survey respondents did not think that the cooperative learning increased their overall understanding of course material, increased interest in the subject matter, or helped their learning of course concepts and principles. However, 45.5% of Institution 1 and 57.2% of Institution 2 students felt the collaboration between institutions helped them think differently about course content (responding somewhat agree or agree). End of the semester student feedback indicated that students were initially open and excited to the idea of collaborative learning between institutions but felt that it added

Table 3. Percentage of twenty students enrolled in an Advanced Animal Systems Management course indicating level of agreement with statements related to course trans-institutional collaborations on a pre-course survey.[a]

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
I am very interested in the content of this course.	0.0	0.0	0.0	5.0	25.0	70.0
I expect the collaboration with students from another university and related assignments to increase my overall learning in the course.	0.0	0.0	0.0	10.0	70.0	20.0
I expect the collaboration with students from another university will help my learning of course concepts and principles.	0.0	0.0	0.0	15.0	70.0	15.0
I expect the collaboration with students from another university will help me to think differently about course content.	0.0	0.0	0.0	10.0	35.0	55.0
I expect the collaboration with students from another university will be a worth-while part of the course.	0.0	0.0	0.0	10.0	65.0	25.0
I feel my previous coursework has prepared me to be successful in this course.	0.0	0.0	0.0	10.0	50.0	40.0

[a]Total respondents, n=20 (100% response rate)

Table 4. Percentage of eighteen students enrolled in an Advanced Animal Systems Management course indicating level of agreement with statements related to course trans-institutional collaborations on a post-course survey.[a]

	Institution	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Collaboration with students from another university increased my overall learning in the course.	1	27.3	27.3	9.1	36.4	0.0	0.0
	2	14.3	42.9	42.9	0.0	0.0	0.0
Collaboration with students from another university is well coordinated with course materials.	1	18.2	45.5	9.1	27.3	0.0	0.0
	2	14.3	42.9	57.1	14.3	14.3	0.0
University collaboration in this course helped my learning of concepts and principles.	1	18.2	27.3	27.3	27.3	0.0	0.0
	2	0.00	14.3	57.1	14.3	14.3	0.0
University collaboration in this course increased my interest in the subject matter.	1	9.1	45.5	18.2	9.1	18.2	0.0
	2	0.0	28.6	28.6	28.6	14.3	0.0
University collaboration in this course helped me to think differently about course content.	1	18.2	36.4	0.0	18.2	27.3	0.0
	2	0.0	14.3	28.6	42.9	14.3	0.0
University collaboration was a worthwhile part of this course.	1	18.2	36.4	18.2	18.2	9.1	0.0
	2	16.7	22.2	16.7	33.3	11.1	0.0

[a]Total respondents, n=18 (100% response rate)

little benefit to the course. Students suggested more opportunities to interact with their peers at the other institution and were optimistic about trying cooperative learning again in future courses.

Discussion

Cooperative learning is based on the theory of social interdependence. Deutsch (1949) described three types of social interdependence: positive, negative, and no interdependence. An example of positive interdependence is cooperative learning, where students feel their individual achievement is linked to the achievement of the group. Students feel that the work of each individual group member is beneficial to the group and that the group cannot succeed without each member (Johnson and Johnson, 1992). Cooperation is best achieved when the activity contains positive interdependence, individual accountability, promotive interaction, social skills, and group processing (Johnson et al., 2013). At the start of the semester, students from both institutions were excited and motivated about the cooperative learning aspect of the course. The course was composed of primarily senior level students with a strong interest in production agriculture. Students from both institutions were initially positive with the trans-institutional aspect of the course. They felt they could learn from their peers both within and outside of their home institutions. Weekly joint lectures, peer-review of fact sheets, and an overnight field trip, were all methods used to achieve more active learning in the course.

At the end of the semester, students did not feel that the trans-institutional cooperative learning was beneficial to their overall learning experience. Interestingly, students expressed appreciation for the collaborative environment they felt within their own institution. Based on the social interdependence theory, there are several elements of cooperative learning that were not met in the activities of the course. Positive interdependence was not achieved across institutions. Within schools, students worked throughout the semester in their small group of two to four students. We used problem based learning as an instructional method to engage our students in authentic problems. Peer-review of materials between schools facilitated exchanging of ideas and allowed students to receive feedback from students from another university. Although, Indiana and Michigan are close in geography, there are some philosophies and management practices that differ between the states. Peer-review provided students with a glimpse of these differences and assisted in starting conversation on each campus. However, we did not create an atmosphere that allowed students to feel that the work their peers were completing at the other institution impacted their achievement in the course.

Although the course was initially designed to promote individual accountability, this was not achieved across institutions. The primary assignment in our course was a semester long group project to complete an Extension fact sheet based on best practices for housing beef cows in confinement. Individual group members were accountable to their school's group members by successfully completing their portion of the work as well as contributing to larger class discussions. This assignment lacked individual accountability outside of the institution. In the future, we propose to integrate groups across the universities.

The course field trip and the weekly lecture meeting were meant to promote interaction between students at each institution. The course field trip was beneficial in allowing students to interact in person and freely exchange ideas. Students visited farms and shared in discussions together. This created a bonding experience and provided students the ability to make connections with their classmates at the other institution. Many students commented that they wished the field trip was before week six of the semester and that there were more face-to-face meetings between the schools. Weekly lectures, shared live between each school, were meant to increase student discussion and interaction. However, the technology that was used often made it difficult for students from both schools to interact. Often, students from the school that was providing the week's lecture were more engaged with discussions. In the future, more emphasis will be placed on facilitating these classes in a way that will encourage more group discussions through the class period between both schools.

After completion of the course, we asked ourselves as the instructors if we provided our students with the right social skills to succeed in the learning environment we tried to create. Gillies and Boyle (2010) reported that students need to be prepared to work cooperatively together. The authors suggested teaching students the skills needed to cooperatively work together as a team and develop interpersonal and small-group skill. Based on the pre-course questionnaire, none of the enrolled students had ever worked with a group in a trans-institutional setting. In future course offerings, we plan to talk to students about best practices in promoting interaction and social skills needed to work beyond the physical classroom.

Summary

Students have high expectations for cooperative work with peers from other institutions. Additional, more deliberate, activities need to occur during the semester to foster the interaction and engagement of students from both schools in the learning process. These activities should be aligned with the five elements of cooperative learning. This alignment will be the focus of the cooperative learning strategy when the course is taught in the future.

Literature Cited

Bonwell, C.C. and J.A. Eison. 1991. Active-learning: Creating excitement in the classroom. ASHE-ERIC Higher Education Report No. 1. Washington, D.C.: The George Washington University, School of Education and Human Development.

Buchanan, D.S. 2008. ASAS Centennial Paper: Animal Science teaching: A century of excellence. Journal of Animal Science 86: 3640-3646.

Deutsch, M. 1949. A theory of cooperation and competition. Human Relations 2: 129-152.

Freeman, S., S.L. Eddy, M. McDonough, M.K. Smith, N. Okoroafor, H. Jordt and M.P. Wenderoth. 2014. Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences of the United State of America 111: 8410-8415. DOI: 10.1073/pnas.1319030111.

Gillies, R.M. and M. Boyle. 2010. Teacher's reflections on cooperative learning: Issues of implementation. JTTE 26: 933-940.

Johnson, D.W. and R. Johnson. 1992. Positive interdependence: Key to effective cooperation. In R. Hertz-Lazarowitz and N. Millet (Eds.), Interaction in cooperative groups: the theoretical anatomy of group learning. New York: Cambridge Press.

Johnson, D.W., R.T. Johnson and K. Smith. 2007. That state of cooperative learning in postsecondary and professional settings. Educational Psychology Review 19: 15-29.

Johnson, D.W., R.T. Johnson and K.A. Smith. 2013. Cooperative learning: Improving university instruction by basing practice on validated theory. Journal of Excellence in College Teaching 25: 85-118.

Knobloch, N.A. 2015. Learner-centered teaching modules. Available at: http://www.ydae.purdue.edu/LCT/HBCU/online_course.html.

Mortensen, C.J. and A.M. Nicholson. 2015. The flipped classroom stimulates greater learning and is a modern 21st century approach to teaching today's undergraduates. Journal of Animal Science 93: 3722-3731. DOI: 10.2527/jas2015-9087.

Murano, P.S. and T.D. Knight. 1999. Introducing a cooperative learning term project into an introductory food science course. NACTA Journal 43: 21-25.

Parrish, J.J., M.F. Smith, R.D. Geisert, D.L. Davis, M.E. Wilson and W.L. Flowers. 2015. How to communicate with undergraduate students that lack an animal science or agriculture background. Animal Frontiers 5(3): 54-59.

Qualters, D.M. 2001. Do students want to be active? The Journal of Scholarship of Teaching and Learning 2: 52-60.

Tsay, M. and M. Brody. 2010. A case study of cooperative learning and communication pedagogy: Does working in teams make a difference? The Journal of Scholarship of Teaching and Learning 10: 78-89.

Engaging Students with Experiential Learning: A Competency Framework for Cross-Curricular Programs

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Abstract

Experiential learning is a key part of agricultural education and communication curricula. Research on experiential learning has primarily focused on its role as a culminating event near the end of students' academic programs, ignoring what skills might be necessary before students begin these experiences. Our objective was to identify common knowledge, skills, and dispositions required by students in two different, but complementary, majors prior to their capstone experience. Through focus groups and telephone interviews with cooperating teachers and internship supervisors, we identified six competencies that students must be proficient in before starting their capstone experience. These are (a) adaptability, (b) agricultural knowledge, (c) collaboration, (d) growth mindset, (e) management, and (f) professionalism. We introduce the experiential learning preparation target, a framework that suggests these competencies should be the focus of early field experiences to better prepare students for capstone events. Our research has implications for how experiential learning is designed and integrated into programs. As these competencies are not tied to specialized career settings, the framework suggests common competencies for cross-curricular majors, especially early in students' programs.

Introduction

University faculty, in two different but complementary majors, have much to contemplate as they work with professionals to prepare students for the workplace. Agricultural education teacher licensure programs must consider science, technology, engineering, and mathematics (STEM) integration; increased use of learning technology as an instructional strategy; and changing student demographics when readying future teachers for today's classrooms (McKim et al., 2016; Stubbs and Myers, 2016; Talbert and Edwin, 2008). Agricultural communication programs must prepare students for changing media environments and expectations, diverse agricultural communication stakeholder groups, shortened response times for sharing information, and more pressure to manage the agricultural industry's image (Cannon et al., 2016; Miller et al., 2015).

To keep curriculum relevant in these dynamic environments, researchers have focused on the skills needed to be competent graduates by examining feedback from students, faculty, alumni, and industry partners (Doerfert and Miller, 2006; Kurtzo et al., 2016; Morgan, 2010, 2012; Morgan and Rucker, 2013). For example, Delphi research methodology was utilized to identify the critical skills that graduates of agricultural education teacher preparation programs need to understand and be able to demonstrate (Standards for School-Based Agricultural Education Teacher Preparation Programs, 2017). This national study engaged and gained consensus from school-based agricultural education teachers, state departments of education personnel, university faculty, and other stakeholders.

Within the agricultural communication industry, Kurtzo et al. (2016) interviewed experts with an average of 15 years of experience and found audience identification, understanding agriculture, knowledge of the communication field, message development techniques, and adaptable skills were viewed as requirements to be successful in the agricultural communication field. Alumni from agricultural communication programs emphasized a similar list of competencies – from writing well to general employment skills – for graduates of university programs (Morgan, 2012). Recently, Leal et al.

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(2017) examined social skill competencies for graduates, finding high importance ratings were associated with positive work values and productivity in the workplace.

Faculty and professionals of agricultural education and communication place high value on practical, hands-on experience and have rated experiential learning as a key component of academic programs (Baker et al., 2012; Knobloch, 2003; Morgan, 2012; Roberts, 2006; Sprecker and Rudd, 1997; Terry et al., 1994). Experiential learning, in which students learn key concepts through direct experience and critically reflect on their knowledge, helps connect classroom theory with workplace practice (Kolb, 1984).

Faculty integrate experiential learning into academic programs in various ways. Student teaching experiences and internships are frequent capstones of many agricultural education and communication programs. Prior to the student teaching experience, agricultural education students complete early field experience (EFE). Guyton and Byrd (2000) defined EFE as the range of school experiences in a teacher education program that occur prior to student teaching. A key aspect of EFE is the interaction and collaboration among the student, cooperating teacher, and university faculty (Smalley and Retallick, 2012). Cannon et al. (2016) found that while most agricultural communication programs include internships in coursework, it was only an optional or recommended part some programs. Capstone courses, in which agricultural communication students create campaigns or magazines, are another valuable way to fulfill the need for experiential learning and improve student confidence and skills for the workplace (Rhodes et al., 2012).

Researchers have studied various aspects of experiential learning including its impact (Leggette et al., 2013) and skill development (Odom et al., 2014), as well as perceptions of graduating seniors (Suvedi et al., 2016), employers (Smalley et al., 2016; Williams et al., 2014), and alumni (Bampasidou et al., 2016). Further research has been conducted on implementation of experiential learning (Lyvers Peffer, 2012), pre-capstone preparation (Wattiaux, 2006), and college models (Estepp and Roberts, 2011; Retallick and Steiner, 2009).

Despite the importance in the curriculum and the value that students, faculty, and professionals place on experiential learning, little research has examined the common competencies for cross-curricular majors, especially early in students' programs. Research on experiential learning and skill development has primarily focused on their role as culminating events near the end of academic programs while ignoring the skills cooperating teachers and internship supervisors might deem necessary before students begin these experiences.

Our study addresses an important question for different, but complementary, majors who want to best prepare students for experiential learning: What are common competencies needed by both agricultural education and agricultural communication students, especially early in their program? This is an important question, as agricultural education and agricultural communication majors are predominantly housed in the same academic department within universities (Weckman et al., 2000). Therefore, students in either major might share core courses during the first few years of their undergraduate program. It is important to examine common competencies that might be addressed early in such courses that would be relevant to both majors and would help prepare all students for their capstone experience.

Theoretical Framework

We utilized an experiential education model proposed by Deslauriers et al. (2016) as the theoretical framework for our study. Their model recognizes the importance of social interaction and its impact on student learning while participating in experiential learning programs. While Dewey's theory of experience (1938) and Kolb's experiential learning model (1984) serve as the foundation of experiential learning programs, Deslauriers et al. (2016) argue that Bandura's social cognitive theory (1986) provides the basis for social factors that enhance student learning and should be acknowledged as a key element in experiential learning programs.

Dewey (1938) is recognized as an early advocate for experiential learning and posited that we do not learn from experience but rather we learn by reflecting on our experience. He proposed that educators recognize the prior experiences students bring to the classroom and purposefully assist students to make meaning of their experiences. Kolb's four-stage model of the experiential learning process built on Dewey's foundational work. His model represents two modes through which learning results: perceiving or grasping experience and processing or transforming experience (Baker et al., 2012; Kolb, 1984). Kolb's experiential learning model provides a structure by which educators can design experiences to meet various learning styles. Finally, Bandura's social cognitive theory posits that learning can occur through a combination of enactive and vicarious experiences. Learning by doing (i.e., enactive learning) aligns with Dewey, while vicarious learning occurs by observation of professional practices being modeled.

Purpose of the Study

The purpose of our study was to determine cooperating teachers' and internship supervisors' expectations for what students should know and be able to do before engaging in their capstone experience. Our specific objective was to identify the common knowledge, skills, and dispositions required by students in two different, but complementary, majors prior to the capstone experience.

Methods

We utilized a grounded theory approach to develop a framework of common learning outcomes for early experiential learning. There were 26 agricultural educa-

tion cooperating teachers and 13 agribusiness internship supervisors who participated in the study. Our data collection process involved four focus groups with the cooperating teachers and individual semi-structured telephone interviews with the internship supervisors.

During focus groups, cooperating teachers were asked to provide their perception about the strengths and weaknesses of student teachers and recommendations for EFE prior to student teaching. Agribusiness internship supervisors were asked during interviews to provide their expectations regarding the knowledge and skills that students should have before starting the capstone internship.

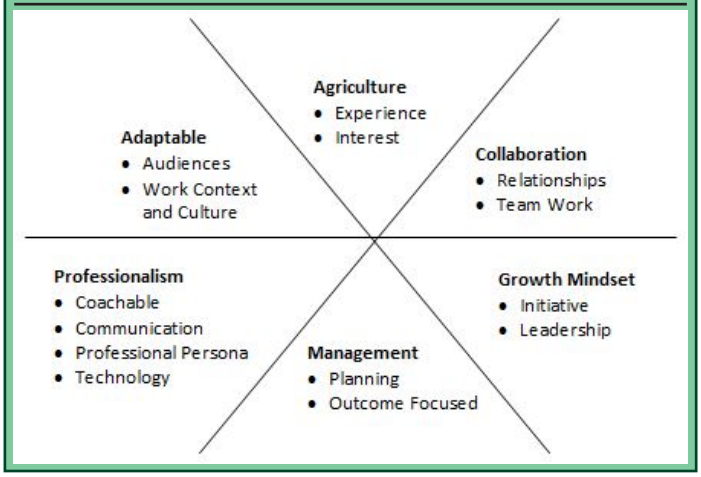
In order to identify commonalities between the two participant groups, a grounded theory approach to data analysis was used. We followed Creswell's (2013) description of grounded theory as a process that relies on qualitative data from interviews to develop the beginning of a theory. This approach uses a constant comparative method of analysis, which is *"a process of taking information from data collection and comparing it to emerging categories"* (p. 86). As Glaser and Strauss (1967) write, the interplay between data collection and analysis is how theory generation may begin. We also used Saldana's (2016) approach analysis by engaging in *"a series of cumulative coding cycles that ultimately leads to the development of a theory"* (p. 55).

Main themes derived from the literature served as a starting point and guided the first phase of open coding to identify ideas related to expected competencies. Analysis consisted of initial coding for key knowledge and skills, followed by axial coding, in which we compared early themes to refine, reorganize, and more fully characterize categories over multiple sessions of data and theme review. During axial coding, we compared themes from the literature to themes emerging from the interview and focus group data. Themes were elaborated by identifying subthemes and major themes were consolidated or split into additional categories to gain a more complete interpretation of the data. Axial coding occurred during repeated discussions among the researchers about similarities and differences within and across themes and sources of data. The themes and subthemes arising from axial coding supported the development of a theory of common learning outcomes for experiential learning. The theory that emerged from these discussions and coding of data elaborated and clarified the common and unique characteristics of competencies required for success in agricultural education and agribusiness internships and careers.

Results

Our analysis of participants' responses resulted in six common competencies expected of agricultural education and agribusiness interns. Cooperating teachers and internship supervisors expect students to have an early experience with each competency and achieve a level of proficiency with each before starting their capstone experience. As shown in Figure 1, the six competencies are: (a) adaptability, (b) agricultural knowledge, (c) collaboration, (d) growth mindset, (e) management, and (f) professionalism. While each competency is described as a stand-alone theme, we recognize there is some overlap and interconnectedness among them. We provide examples and explanatory details for each competency derived from study participants in the following sections.

Figure 1. Experiential Learning Preparation Target: A Competency Framework for Cross-Curricular Programs



Adaptability

Being adaptable includes being flexible and able to work across differences in audiences, work context, and culture.

Audiences. Adapting to the needs of different audiences includes understanding differences in audience needs, how to communicate with different audience members, and which tools to use to connect with students, administrators, co-workers, or the public. Cooperating teachers want pre-service teachers to able to talk with administrators, connect with other teachers who are not in their specialty, and differentiate instruction for students. Agribusiness intern supervisors stressed the need for interns to be able to communicate effectively with a variety of audiences such as farmers, youth, and adults.

Work Context and Culture. Adapting to the work context and recognizing cultural differences is important in school and business settings. Cooperating teachers discussed student teachers need to be able to teach a variety of subjects effectively in a wide variety of classroom settings and at different types of schools. Agribusiness interns must adapt to differences in team culture, recognize the "unwritten rules" of any organizational setting, and be ready to adapt to cultural differences, including cross-generational cultural norms.

Agricultural Knowledge

The discussion of agriculture focused on the importance of student teachers and interns knowledge, experience, or background in agriculture. Cooperating teachers specifically commented that student teachers

need to have more experience and skill in the agricultural content area of agricultural mechanics. There was agreement among almost all internship supervisors that students should have general knowledge or a background in agriculture, but detailed expertise was not expected. If students had limited experience in agriculture, then supervisors wanted them to have an affinity for or interest in agriculture to make the most of their internship experience. For example, an intern supervisor said: *"We tend to lean towards this-having a basic level of ag knowledge, so they understand stakeholders they will work with. But, it is not critical they have a great background in the pork industry. [Our intern] did not have this experience but you could tell she wanted to learn and she put in the effort to learn about the industry. We saw more growth in her not having this background than with kids who did have that experience in the pork industry. We can show them what we do in a feed mill or sow farm."* Some internship supervisors noted having little or no knowledge of agriculture was acceptable or even desirable in an intern. One stated that students *"can learn about agriculture and about rural areas; it is better if they are a blank slate."* Similarly, another said, *"In terms of technical knowledge, we are okay with an entirely fresh slate to build on."*

Collaboration

The collaboration competency includes skills of relationship-building and teamwork.

Relationships. Student teachers must be ready to develop appropriate relationships with students and their families, other teachers, school staff, and with members of the community. Intern supervisors also addressed the importance of fostering good relationships with internal and external customers. One supervisor described the high value placed on relationship-building as a skill by saying: *"We cannot develop their ability to genuinely connect and have a dialogue and good communication skills, integrity, and the ability to listen. Those are the things that have higher priority when we hire young people rather than the nuts and bolts experiences."*

Appropriate relationships are not limited to face-to-face interactions. Study participants also discussed the importance of collaborating effectively and appropriately when using social media.

Team Work. Students must be ready to collaborate and team with their supervisors, departmental team members, and co-workers in other departments. For teachers, this includes understanding how to develop collaborative working relationships with their cooperating teacher during student teaching as well as working effectively with other subject area teachers and administrators. Working in teams is a skill all students must master to accomplish goals and work effectively.

Growth Mindset

Growth mindset includes the attitudes or characteristics of initiative and leadership. Cooperating teachers noted the importance of *"going beyond traditional classroom instruction"* to take an active role in supervising FFA activities and incorporating SAE (Supervised Agricultural Experience) into their practice. Intern supervisors talked about personal characteristics or work habits relating to independence, confidence, and a willingness to learn. An internship supervisor expressed the view that interns need to be "motivated to get more experience." Participants wanted students to be open to new challenges and described ideal candidates as curious, enthusiastic and eager to learn. They wanted students to come ready to be lifelong learners that would "keep up with changes" in their field and know that professionals must "keep learning all the time."

Initiative. Cooperating teachers talked about initiative as an aspect of growth. Student teachers should take "the initiative to learn more about how to teach" and take "risks with trying new ways of teaching." Intern supervisors described initiative as interns being "self-motivated" and able to "work independently." An internship supervisor summarized this view by saying, students need strong time management skills and she needs to be able to "rely on them to ask questions when they have them and follow through on things." Supervisors also said they want students to know the value of their skills and knowledge and be ready to "own and articulate" their contributions.

Leadership. Skills related to leadership for student teachers included being able to effectively manage a classroom and supervise FFA activities outside of the traditional school day and school year. Internship supervisors specifically mentioned leadership as a desirable skill or quality among interns. They wanted students to be "confident enough to lead." Supervisors also wanted students to be confident enough to share new ideas, in order to make internship experiences a "win-win."

Management

Management as a competency goal for early experiential learning includes skills associated with planning and being outcome focused.

Planning. Participants extensively discussed planning as an important skill for students. Cooperating teachers described planning in terms of developing individual lessons as well as longer term "cohesive units" of study. They also said it was important that student teachers can plan for effective use of instructional time daily and throughout the school year. One teacher discussed the importance of daily planning; it is important to *"use time well in short class periods; streamline the 'housekeeping' parts of teaching to maximize teaching time; (and know) how to streamline setup so they are ready to teach as quickly as possible."* Among internship supervisors who discussed the importance of planning, the focus was on self-management in the workplace and larger scale project management.

Outcome Focused. In addition to planning, participants also expect students to be able to evaluate the success of their work and focus their efforts towards

organizational outcomes or objectives. Cooperating teachers stressed the importance of aligning day-to-day teaching with longer-term objectives and expected educational outcomes. One teacher described focusing on outcomes as *"connecting instruction and activities to learning objectives; starting with the objectives rather than the activity."* An internship supervisor said students *"need to do things they have to do even if they are not very interested in it; they need to be willing to work for a goal even if they don't agree"* with the employer's goals or outcomes. Another supervisor said they wanted students to know how to *"follow a project to its end and keep their energy up and the big picture in mind."*

Professionalism

Professionalism includes demonstrating the knowledge, skill, attitude, and behavior expected in the workplace. Students must be coachable, exhibit effective written and spoken communication skills, present a professional persona, and effectively use technology.

Coachable. Being coachable is an aspect of professionalism in which students learn to recognize and act on their need to grow and learn in the profession. Participants expected students to be "open to learning" new things on the job, "taking and giving feedback," and seeking learning opportunities by attending relevant professional association workshops and conferences. At the same time, supervisors wanted students to *"self-advocate, which is huge in interviews, as they need to know their own abilities and be able to say no."*

Communication. Participants spoke of the importance of students having strong communication skills, specifically effective writing and speaking skills. Cooperating teachers commented on the need for student teachers to communicate effectively with a wide variety of students and audiences. Some of their comments overlap with the adaptable theme and its supporting themes of audiences and cultures.

Expectations for effective written communication skills varied depending on the specific tasks to be accomplished during student teaching or the internship and the school or type of organization in which they were placed. For example, students working in journalism-related placements were expected to be "competent writers" who could write "a good coherent press release" and understand how to draft many types of organizational communication such as newsletters or newspaper articles.

Most internship supervisors said they expected interns to be able to speak professionally in a variety of settings, including on the telephone, while addressing large audiences, and in one-on-one interactions with customers, co-workers, and others. One internship supervisor described the importance of EFE and course learning outcomes that help students to develop communication skills: *"We cannot develop their ability to genuinely connect and have a dialogue and good communication skills, integrity and the ability to listen."*

Professional Persona. Cooperating teachers and internship supervisors discussed the need for students to have a professional persona. Students must understand expectations of the workplace and engage in behaviors that reflect well on themselves, their employer, and the profession. Having a professional persona includes dressing and communicating appropriately, focusing on assigned tasks during work hours, and following the rules of social engagement in a work environment. A cooperating teacher described a professional persona as *"distinguish(ing) yourself from your students in dress, manner, and communication."* Teachers also emphasized the importance of guarding a professional reputation when using social media and email for communication. Internship supervisors focused on the need to maintain a professional persona as a representative of the employer's organization and to work effectively in an office setting among other professionals. As one supervisor said, interns "should know how to communicate and what not to say. For example, they must know not to tell growers that their field is bad." Other supervisors stressed the importance of *"employability skills: showing up on time, dress(ing) appropriately. They should not work on school work when they are working for me."*

Accountability was an aspect of professional persona associated with effective time management, task accomplishment, and using models of best practices. An internship supervisor summarized this view by saying students need to *"look at their class schedules and plan ahead when they are going to have projects or tests, so we can plan our work flow. We know things come up, we know school is the priority, but we want to work with them to make sure they are being responsible to the employer. The students that do the best can manage their time."* Students must learn *"how to be the most efficient in where and how they work,"* as one supervisor said.

Technology. Participants expected students to have experiences with technology prior to the capstone internship that prepared them to effectively use technology to accomplish workplace tasks as well as to appropriately use technology (e.g., social media). There was some overlap between the technology theme and the professional persona theme. Cooperating teachers said students should be able to use technology to support teaching and student learning. Examples were to use the Internet to find teaching resources, use electronic grading systems, and be proficient with using iPads/tablets for one-to-one and Internet-based instruction. Cooperating teachers stressed the need for students to be comfortable teaching technical subjects such as agricultural mechanics and utilizing technology to teach in a variety of settings such as greenhouses and labs. Internship supervisors expected effective use of technology from their interns as noted in their comments: *"should know Microsoft basic computer skills", "[We] assume younger people will be good at technical skills", "Graphic design is helpful but not necessary, they can*

pick it up on the job." Participants described appropriate use of social media as an essential skill.

Discussion

Our research has implications for how experiential learning is designed and integrated into programs. The focus of this research has been to identify common competencies that should be addressed in early learning efforts before college students narrow their coursework as they refine their career choices. We identified major competencies that were expected regardless of career field. This suggests that there might be opportunities to integrate experiential learning earlier in academic programs, that are cross-curricular and not tied to a specialized career setting. This is an important shift in how experiential learning is currently integrated into programs.

If programs add early experiential learning to their coursework that focus on the common competencies identified here, students may be better prepared and will perform better in later experiential learning courses and activities. With additional options to apply early coursework in real-world and diverse settings, later experiential learning might have greater impact on students as they become more self-directed and have greater mastery of common learning outcomes. EFE concentrating on common learning goals gives students the opportunity to benefit greatly from subsequent more advanced and specialized experiential learning opportunities. With more experiential learning available in the first and second year that are not tied to specific majors, cross-curricular opportunities for experiential learning courses and efficiency in teaching may be strengthened. Universities and students could also expand the number, type, diversity, and scope of partnerships with community members by providing EFE based on these six expected common competencies in addition to more traditional specialized capstone experiences.

Our research can also be used to improve assessment of experiential learning and strengthen mentoring of students. The competencies identified in our research might be used by faculty to plan experiential learning activities early in programs and assess students along a growth continuum built around these competencies. Focusing on these outcomes might also improve mentoring by giving supervisors and program partners concrete, effective, and common criteria for assessing student growth. Students might also use these competencies to guide self-assessment and reflective activities, and in turn, strengthen student's professional development plans, course selection, and future internship and career choices.

The experiential education model proposed by Deslauriers et al. (2016) was the theoretical framework for our study. A key feature of the authors' model is the integration of Bandura's social cognitive theory (1986) and development of a student's self-efficacy. Bandura (1986) described self-efficacy as a belief in one's ability to succeed in specific situations or accomplish a task. Our research identified competencies that cooperating teachers and internship supervisors find necessary for students to be proficient with before beginning their capstone experience. As students socially interact with individuals, the workplace environment, and their behaviors during experiential learning, they can increase their self-efficacy. If students can develop their self-efficacy with the competencies found in our Experiential Learning Preparation Target (see Figure 1), they will be setting themselves up for success and continued growth during the capstone experience of student teaching or internship.

Limitations and Future Research

Although this research has offered a solid start for expanding experiential learning integration, it does have limitations. First, the research was conducted with students in two majors that are related and have some overlapping coursework. Future research might evaluate these findings to see if early competencies would also be similar for majors that are more distinct, such as animal science or applied economics.

Summary and Conclusion

Experiences that connect the classroom to the world outside the classroom can be powerful ways to deepen student knowledge and skill. Integrating these opportunities early in programs can improve students' capabilities for subsequent specialized learning and their competencies for career success. EFE, focused on common competencies such as those identified here, ready students for later field experiences and thereby improve their effectiveness. Expanding EFE in both teacher preparation and agricultural communication programs gives students more time to reflect on their growth and provide additional social interactions and opportunities that guide future development. It is important to continue researching the range of potential learning outcomes for experiential learning and to look for the best ways to include these opportunities in curriculum.

Literature Cited

Baker, M.A., J.S. Robinson and D.A. Kolb. 2012. Aligning Kolb's experiential learning theory with a comprehensive agricultural education model. Journal of Agricultural Education 53(4): 1-16.

Bampasidou, M., K. Grogan, J. Clark and M. Sandberg. 2016. Career skills: Perceptions of importance and high impact learning activities for skill development in agricultural economics and agribusiness programs. NACTA Journal 60(1a): 36-42.

Cannon, K.J., A.R. Specht and E.B. Buck. 2016. Agricultural communications: A national portrait of undergraduate courses. Journal of Applied Communications 100(1): 6-16.

Creswell, J. 2013. Qualitative inquiry and research design: Choosing among five approaches. 3rd ed. Thousand Oaks, CA: SAGE Publications, Inc.

Deslauriers, J.L., R.D. Rudd, D.M. Westfall-Rudd and R.K. Splan. 2016. The critical need for merging educational learning theories with experiential learning programs in animal agriculture: A literature review. NACTA Journal 60(3): 307-312.

Doerfert, D.L. and R.P. Miller. 2006. What are agriculture industry professionals trying to tell us? Implications for university-level agricultural communications curricula. Journal of Applied Communications 90(3): 17-31.

Estepp, C.M. and T.G. Roberts. 2011. A model for transforming the undergraduate learning experience in colleges of agriculture. NACTA Journal 55(3): 28-32.

Glaser, B. and A. Strauss. 1967. The discovery of grounded theory: Strategies for qualitative research. Chicago, IL: Aldine Transaction.

Guyton, E. and D. Byrd. (Eds.). 2000. Standards for field experience in teacher education. Reston, VA: Association of Teacher Educators.

Knobloch, N.A. 2003. Is experiential learning authentic? Journal of Agricultural Education 44(4): 22-34.

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

Kurtzo, F., M.J. Hansen, K.J. Rucker and L.D. Edgar. 2016. Agricultural communications: perspectives from the experts. Journal of Applied Communications 100(1): 33-45.

Leal, A., R. Telg and J. Rumble. 2017. Identifying the role of social skills in agricultural communication programs. The Southern Association of Agricultural Scientists Convention, Mobile, AL, February 5-6, 2017.

Leggette, H.R., C. Black, B.R. McKim, D. Prince and S. Lawrence. 2013. An intrinsic case study of a post-secondary high-impact field experience. NACTA Journal 57(3a): 129-138.

Lyvers Peffer, P.A. 2012. Elements and analysis of an internship program in animal sciences. NACTA Journal 56(2): 2-8.

Morgan, A.C. 2010. Competencies needed by agricultural communications undergraduates: An industry perspective. Journal of Applied Communications 94(1-2): 19-32.

Morgan, A.C. 2012. Competencies needed by agricultural communication undergraduates: A focus group study of alumni. Journal of Applied Communications 96(2): 17-30.

Morgan, A.C. and K.J. Rucker. 2013. Competencies needed by agricultural communications undergraduates: an academic perspective. Journal of Applied Communications 97(1): 50-65.

Odom, S.F., M. Shehane, L.L. Moore and B. McKim. 2014. An analysis of a high-impact field experience in agriculture: Documenting critical thinking skills through reflection. NACTA Journal 58(3): 214-220.

Retallick, M.S. and C. Steiner. 2009. A model for implementing a college-wide experiential learning program in higher education. NACTA Journal 53(1): 2-6.

Rhodes, T.N., J.D. Miller and L.D. Edgar. 2012. Evaluating capstone courses: Employing the five R's model to analyze an agricultural communications magazine class. NACTA Journal 56(1): 8-16.

Roberts, T. G. 2006. A philosophical examination of experiential learning theory for agricultural educators. Journal of Agricultural Education 47(1): 17-29.

Saldaña, J. 2016. The coding manual for qualitative researchers. 3rd ed. Los Angeles, CA: SAGE Publications, Inc.

Smalley, S.W. and M.S. Retallick. 2016. Early field experience of business and family and consumer sciences teacher education. NACTA Journal 60(4): 352-357.

Smalley, S.W., M.S. Retallick, D. Metzger and B.C. Greiman. 2016. Analysis of leadership perceptions, skills and traits as perceived by agribusiness and industry professionals. NACTA Journal 60(1a): 43-48.

Sprecker, K.J. and R.D. Rudd. 1997. Opinions of instructors, practitioners, & alumni concerning curricular requirements of agricultural communication students at the University of Florida. Journal of Agricultural Education 38: 6-13.

Standards for School-Based Agricultural Education Teacher Preparation Programs. 2017. http://aaaeonline.org/Standards-for-Teacher-Preparation. American Association for Agricultural Education. June 15, 2017.

Suvedi, M., R.P. Ghimire and K.F. Millenbah. 2016. How prepared are undergraduates for a career? NACTA Journal 60(1a): 13-20.

Terry, R., P. Vaughn, J. Vernon, J. Lockaby, F. Bailey-Evans and M. Rehrman. 1994. Enhancing the agricultural communications curriculum: a vision for the future. Unpublished manuscript, Lubbock, TX.

Wattiaux, M. 2006. Preparing sophomores for independent learning experiences with a pre-capstone seminar. NACTA Journal 50(3): 19-25.

Weckman, R., D. Witham, and R. Telg. 2000. Southern agricultural communications undergraduate programs: a survey. Journal of Applied Communications 84(4): 41-50.

Williams, K., T. Robertson and L. Keith. 2014. Skills, knowledge and abilities employers seek in new professionals entering careers in the fed beef industry. NACTA Journal 58(4): 349-355.

A Systematic Map and Scoping Review of Soft Skill Assessment Instruments for College Students and Peer Mentoring Programs[1]

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Abstract

Soft skills such as leadership, communication, and professionalism are essential for employment in agriculture and the related sciences, but recent graduates have failed to meet employers' expectations in soft skill development. Peer mentoring and peer leadership programs have been proposed as one method to increase soft skill development. This study sought to catalog published soft skill assessment instruments and evaluate their relevance to college students and college student peer mentors. A systematic map of soft skill assessment instruments was developed from a multidisciplinary review of 3,200 peer reviewed journal articles from three databases. Forty-three instruments were identified to measure three soft skills valued by agricultural employers: leadership, communication, and professionalism. These instruments hold value for their utility in program evaluations, as pedagogical tools, or in program curriculum development. Recommendations for appropriate instruments to measure soft skill development in the context of college student peer mentoring and/or peer leadership programs were made based on a hierarchical assessment of psychometric evidence, generalized construct validity, composite relevance to college students and peer mentoring, lowest cost, and fewest questions. Results indicate a gap in the literature of instruments that are contextually situated in the college student peer mentoring experience.

Introduction

Colleges are responsible for preparing students to meet the challenges of the workforce. Employers of recent agricultural and natural resources graduates ranked soft skills as the most important area of preparedness for new graduates, ahead of disciplinary knowledge, technical skills, and project management skills (Crawford et al., 2011). However, recent graduates have failed to meet employers' expectations in soft skill development (Association of American College and Universities, 2015; Robinson and Garton, 2008). Soft skills are the broad range of non-technical abilities, skills, and traits that are valued in the labor market (Robles, 2012). The Association of Public and Land-Grant Universities identified seven soft skill clusters that relate to success in newly hired graduates: leadership, decision making/problem solving, professionalism, team skills, communication, self-management, and hands on knowledge/experiences (Crawford et al., 2011). A student's soft skill development can predict and causally produce success (Heckman and Kautz, 2012). As a result, colleges of agriculture and related sciences are charged with graduating students who demonstrate high levels of technical acumen and interpersonal competence.

It has been shown that a college student's peer group has perhaps the strongest effect on cognitive and affective development over any other single factor in higher education (Astin, 1996; Kram and Isabella, 1985). As a result, peer-led programming has been looked to as one method to positively impact soft skill development in future graduates. Over 75% of universities in the United States have peer mentoring or helping programs (Newton and Ender, 2010) that may be designed, in part, to support soft skill development in undergraduate students. Peer mentoring programs, in particular, have been shown to positively impact both mentors and

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mentees. Peer mentors may perform duties across 15 categories of functions: support/encouragement, advice/guidance, access to resources, challenge/opportunity, clarify values/goals, coaching, information, protection, role model, social status, socialization/"host and guide", sponsorship/advocacy, conduit of knowledge, training/instruction, visibility/exposure (Jacobi, 1991). Mentees gain skills to overcome academic and psychosocial challenges, increasing their self-efficacy as a result of a mentoring relationship (Bean and Eaton, 2001; Bonin, 2013; Washburn, 2008). Mentors have been found to benefit socially, academically, and in the development of leadership skills (Astin, 1993; Kram and Isabella, 1985). Evidence suggests that peer mentoring programs can positively impact the soft skill development of both mentors and mentees.

Program evaluations and assessments of soft skill development allow peer mentoring program administrators to measure the impact of mentoring on both mentors and mentees and ensure programs are producing positive changes. These evaluations can serve to inform data-driven decisions related to program design, implementation, funding, and curriculum. There is a need for more methodologically sound evaluations of formal mentoring programs (Roger and Temblay, 2003; Jacobi, 1991), as the implementation of mentoring programs has historically outpaced studies of their impacts and efficacy (Crisp and Cruz, 2009) and evaluations have been narrowly focused on measuring academic outcomes as a result of mentoring (Hall and Jaugietis, 2011).

A large number of commercially and publicly available instruments exist to measure soft skills (Spitzberg, 2003). These instruments are generally theoretically sound and well tested and can be incorporated into a systematic program evaluation. Their use requires less time input than developing a novel instrument for a program evaluation or skill assessment. Because so many instruments exist, there is a need to specifically evaluate the utility and relevance of these instruments in the context of a college student peer mentoring program evaluation, and for college students in general.

Systematic maps were developed in the social sciences to "reliably catalogue evidence on a specific subject" (Haddaway et al., 2016, p. 613) in the form of searchable databases and detailed descriptive information. These maps synthesize extant literature in an objective, transparent, and repeatable way that minimizes the selection, publication, and detection bias of traditional literature reviews (Pullin and Stewart, 2006). Findings from systematic maps hold implications for best practice development by policy makers, researchers, and practitioners. Scoping reviews provide a broad understanding of the literature to inform a systematic map. Scoping reviews differ from systematic reviews, which aim to answer a specific question through assessment of existing literature (Haddaway et al., 2016). Scoping reviews are used to identify primary and secondary research, summarize the extent and nature of research activity on a broad topic, and identify future areas of research (O'Flaherty and Phillips, 2015). In concert, systematic maps and scoping reviews provide a broad, objective understanding of the literature.

The objectives of this study were to:

- Identify psychometrically sound assessments of leadership, communication, and professionalism; and
- Assess and evaluate the relevance of identified instruments in measuring soft skill development of (a) peer mentors and mentees and (b) college students.

Materials and Methods

Phase I: Scoping Review to Identify Instruments

Definitions of key constructs were developed based, in large part, on the descriptions of soft skills generated by agricultural employers in Crawford et al. (2011).

- Leadership: a values-based, non-positional process to purposefully affect change or reach a goal. Leadership consists of skills, behaviors, and processes that demonstrate a person's ability see the big picture and strategically work with and empower others. Leaders motivate others, know when to step up or step aside, and celebrate the contributions of others.
- Communication: a set of skills that includes effective listening to produce concise, accurate, professional, and pleasant oral and written messages in various settings including public speaking, group discussions, reports, and emails.
- Professionalism: the general ability to form effective relationships with constituencies, accept and apply constructive feedback for improvement, and have a clear understanding of one's role in a professional setting. Professionalism can be understood as the broader set of skills, demeanor, and decorum expected of an employee. Professionalism can be demonstrated in a workplace, an organization, a classroom, or in non-formal interactions with a person.

The multidisciplinary scoping review and systematic map followed an adapted version of the methodological framework developed by James et al. (2016). This study was deemed exempt under federal regulation 45 CFR §46.101. Database searches were performed between January and April 2017 using eight search terms developed to locate peer reviewed journal articles related to each of the identified variables. Search terms consisted of one paired set of variable and descriptor, combined to create 32 unique search terms (Table 1).

Searches were conducted through Google Scholar and WorldCat, a search that indexes seven databases: Academic OneFile, Academic Search Complete, Directory of Open Access Journals, MasterFILE Complete, Newspaper Source Plus, OAIste, and WorldCat.org. Each search term was individually entered into the two search engines, and the first 50 articles returned for

Table 1. Thirty-two search terms (individual pairings of variable and descriptor) used to identify research related to communication, leadership, and professionalism/employability through two electronic search engines.

Variable		Descriptor
Communication		Instrument
		Survey
Leadership		Assessment
	AND	Assessments and surveys
Professionalism		Instruments for college students
		Questionnaire
Employability		Measurement
		Student (variable)

each were considered for inclusion in the study. A single individual conducted these searches and was audited on three occasions to ensure compliance with search protocols. Article titles and abstracts were visually assessed to determine preliminary eligibility in the study based on the measurement of the construct as defined. If preliminary eligibility was established, the instrument being used was identified and entered into a Microsoft Excel codebook to be further investigated for potential inclusion in the sample.

Phase II: Collection of Relevant Background Data

After all 64 searches had been performed, the researchers sought out electronically accessible, published copies of questionnaires, scales, and survey instruments and associated background literature for all instruments identified in phase one. Background literature, including reports of psychometrics and detailed instrument information based on the variables identified by Huber et al. (2000), was gathered through directed searches for specific information with Google Scholar, WorldCat, ERIC (EBESCO), other electric journal search engines provided by Ohio State University Libraries, and publishers' websites. Twenty-two data points of general information, psychometrics, and utility were recorded for each instrument. Authors and publishers were contacted directly via email when copies of instruments or key information could not be located. Follow up emails were sent to non-respondents 10 days later. Notes were recorded if authors or publishers were unable to provide free sample questions, instruments, or key information one week following the second email.

Phase III: Determination of Instrument Eligibility and Development of a Systematic Map

As background data were gathered, instruments were compared against a standardized list of exclusion criteria. Two reviewers independently assessed the titles, abstracts, articles, instruments, and reference lists of the studies retrieved by the literature search to determine if the instrument met the criteria for exclusion from the sample. Instruments were excluded from the sample if any of the following were true:

- The instrument under consideration failed to measure all, or part of, the specific construct previously defined.
- Key background information could not be located through the literature, author's or publisher's website, or provided directly by the author or publisher via email with reasonable effort and in a reasonable amount of time.
- The instrument was published prior to 1980. This date was selected to reflect the broader shift towards post-industrial leadership paradigms in 1978 (Outcalt et al., 2001).
- The instrument was not published in or could not be easily obtained in English.
- The instrument was specifically developed for audiences outside of the United States. While "global" instruments were included, instruments designed to reflect a specific culture and normalized for international audiences were excluded.
- More than 10% of the questions in the instrument bore no relevance to either (a) peer mentors or (b) college students in general. The words being used to describe relationships and actions would not make sense and would be actively confusing to either peer mentors or college students, as indicated with a rating of "0" in either "Relevance to College Students" or "Relevance to Peer Mentors." For example, instruments that explicitly use language centered on doctor/patient roles were excluded, while instruments developed and tested in clinical settings that did not have explicit language about doctor and patient roles were included.
- The instrument was not intended for use as a paper or electronic survey instrument. Interview guides, checklists, observational sheets, or other instruments to assess soft skills through direct participant observation were not included in the analysis.

The above criteria for exclusion were developed based on Levas et al. (2010) recommendations for scoping study methodology. Three reviewers rated each included instrument for its relevance to peer mentors/mentee and college students on a four-point scale, 0-3 (Table 2). Each rater was trained on scoring guidelines and given a standardized codebook (Brown et al., 2013) for instrument assessment with detailed instructions for data recording and interpretation. Calibration tests were performed on three separate occasions to establish inter-rater reliability. Audits were performed to ensure compliance with the standardized codebook. Composite relevance scores were obtained by adding the instrument's score for relevance to peer mentors/mentees and relevance to college students.

Phase IV: Instrument Evaluation

Three top-ranked instruments for each variable were determined using a hierarchical scoring checklist

Table 2. Rating System for Scoring an Instrument's Relevance to the Peer Mentoring Relationship and College Students

Relevance to peer mentors/mentees	Relevance to college students
0 = not relevant at all to peer mentors or mentees. Words being used to describe relationships and duties are not relevant, and may not make sense or be confusing to peer mentors	0 = not relevant at all to college students. Words being used to describe relationships and duties are not relevant, and may not make sense or be confusing to college students (for example, talking about work colleagues, bosses, or work meetings)
1= not specifically relevant to peer mentors or mentees, but the terms being used are generally applicable and understandable	1= not specifically relevant to college students, but the terms being used are generally applicable and understandable
2 = fairly relevant. The instrument uses general terms that are highly relatable to the mentoring experience	2 = fairly relevant. The instrument uses general terms that are highly relatable to college students
3 = extremely relevant. This instrument specifically talks about mentoring, sub-duties of mentoring, or relates to the mentoring experience	3 = extremely relevant. This instrument specifically talks about college students and relates to the college experience

(Figure 1). This checklist represents a general list of key considerations of program administrators in selecting an instrument to assess or evaluate student development. It does not reflect all possible considerations that go into making such a decision. Practitioners conducting a program evaluation should critically analyze the relevance of these criteria to their evaluation needs, as these instruments are not universally applicable to all peer mentoring programs.

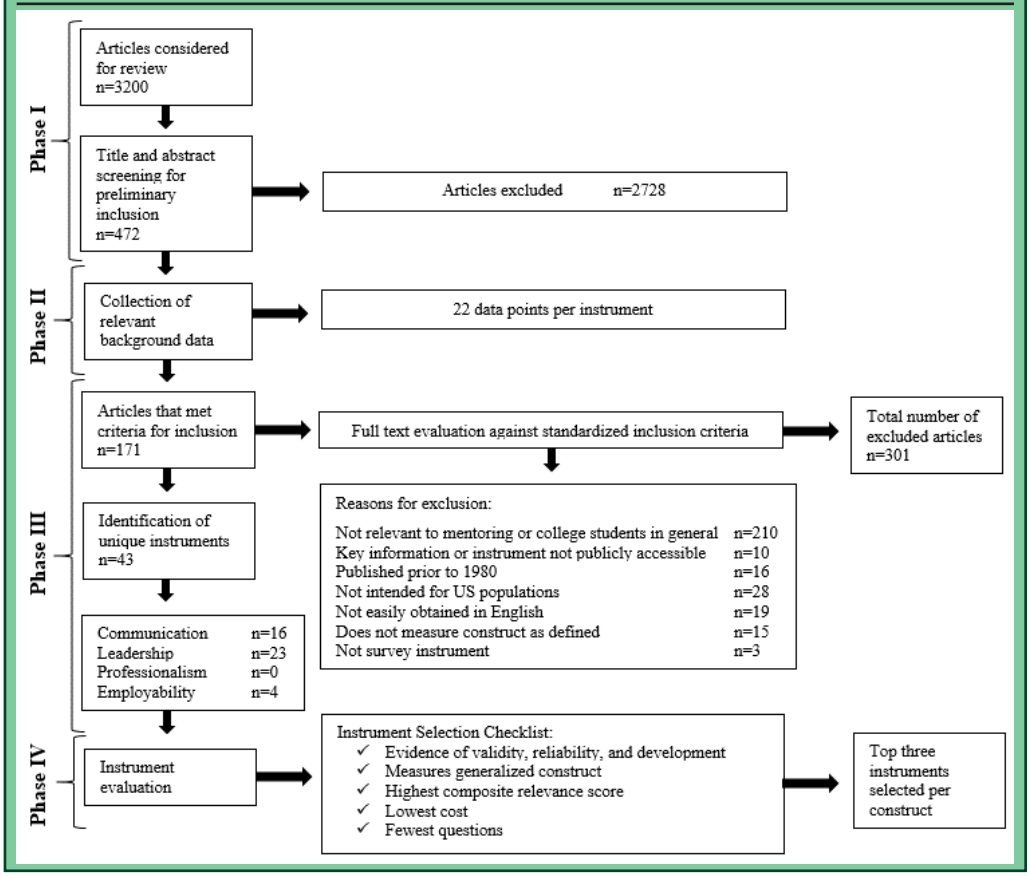
Results and Discussion

The articles returned in Phase I could be broadly categorized into studies that (a) utilized an instrument to collect data or (b) reported on the development or testing of a new or established instrument. Phase one identified 63 communication instruments, 72 leadership instruments, and 29 professionalism instruments from approximately 410 publications. However, the initial assessment of the 29 professionalism instruments revealed that none of these measured the previously established definition. Instruments that did measure professionalism as defined tended to be disciplinary-specific for medical or teaching fields and were excluded from the sample because of their lack of relevance to peer mentoring or college students (Figure 1). Reevaluation of the related literature revealed that the definition of professionalism developed based on Crawford et al. (2011) was more closely measured by employability instruments, which assess *"a set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations"* (Knight and Yorke, 2004, p. 22). Phase one was repeated with employability search terms (Table 1) and resulted in the preliminary identification of 26 instruments from 64 additional publications.

Twenty-two data points of general information, psychometrics, and utility were recorded for each instrument. All instruments were assessed against a standardized list of criteria (Figure 1). Of the publications that were excluded for not being relevant to peer mentoring or college students, 81 were exclusive to healthcare, 54 exclusive to individuals with disabilities and traumatic injuries, and 25 exclusive to teaching and primary/secondary school context. For measures of leadership and communication, 33 publications were found to be exclusive to the workplace and were also excluded. Duplicates were screened out, resulting in the inclusion of 43 instruments, scales, questionnaires, or surveys in the final systematic map. A database of all included instruments across all 22 data points can be accessed in Murray (2017).

Instruments were evaluated against a practitioner-developed checklist (Figure 1) for instrument selection to determine the top three recommended instruments for each variable (Table 3). This checklist included a composite score of an instrument's relevance to mentoring and relevance to college students (max score: 6).

Figure 1. Literature Included and Excluded at Each Phase of the Scoping Review and Systematic Mapping Process



Communication

Sixteen communication instruments were included in the systematic map (Murray, 2017). Of the 16, none were found to have any associated cost for research use at the time of inquiry. Instrument length ranged from 5 to 200+ questions. Seventy-five percent were specifically developed with or intended for use with college students, and all had published accounts of development and testing, including validity and reliability testing. While some instruments focused on sub-skills of communication, such as intercultural communication, conflict communication, or willingness to communicate, most assessed multiple aspects of communication. The 16 instruments scored between 1-2 in relevance to mentoring role, and between 1-3 in relevance to college students (Figure 2).

Table 3. Top Three Recommended Instruments to Measure Communication, Leadership, and Professionalism/Employability

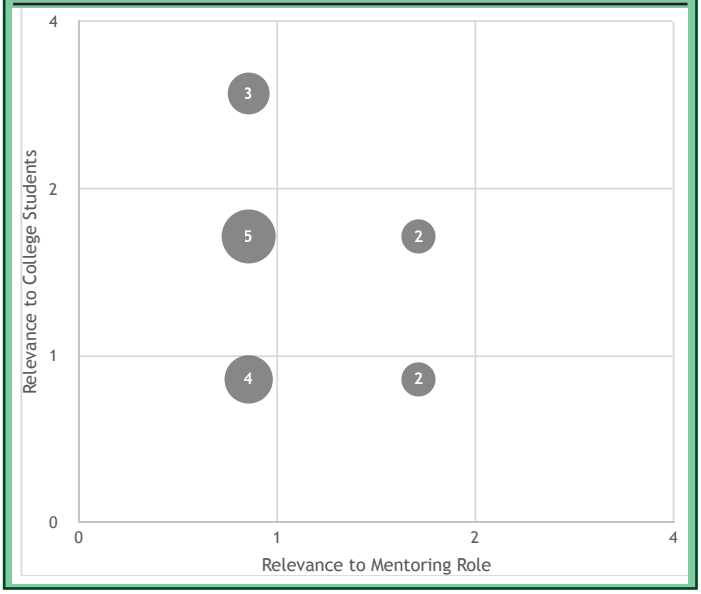
	Instrument	Relevance to Mentoring	Relevance to College Students	Cost	Number of Questions
Communication	Personal Report of Communication Apprehension-24	2	2	$0	24
	Self-Rated Competence	2	2	$0	28
	Student Communication Motives Scale	1	3	$0	30
Leadership	Servant Leadership Behavior Scale	3	1	$0	35
	Multifactor Leadership Questionnaire-5X	2	2	$2.50[z]	45
	Leadership Practices Inventory	1	3	$7.00[z]	30
Employability	Career Adapt-abilities Scale	1	3	$0	24
	Dispositional Measure of Employability	2	1	$0	25
	Occupational Work Ethic Inventory	1	2	$0	50

[z] indicates cost varies based on version, intended use, population, and quantity.

The top three recommended instruments for measuring communication in college student peer mentors are:

1. Personal Report of Communication Apprehension (PRCA-24), which measures communication in four settings: groups, meetings, dyadic conversations, and public speaking (McCroskey et al., 1985). The PRCA-24 provides one of the most holistic measures of communication for college student or general use.
2. Self-Rated Competence (SRC), which assesses one's perception of their conversational partner's and their own communication competence (Cupach and Spitzberg, 1981). This instrument offers a 360° perspective on student communication following a partnered conversation.
3. Student Communication Motives Scale (SCMS), which assesses students' motives for communicating with instructors (Martin et al., 2000). This instrument is particularly well suited for peer mentors that are embedded in academic or first year experience classes, or function as supplemental instruction providers or tutors.

Figure 2. Intersection of Relevance Ratings for 16 Included Communication Instruments



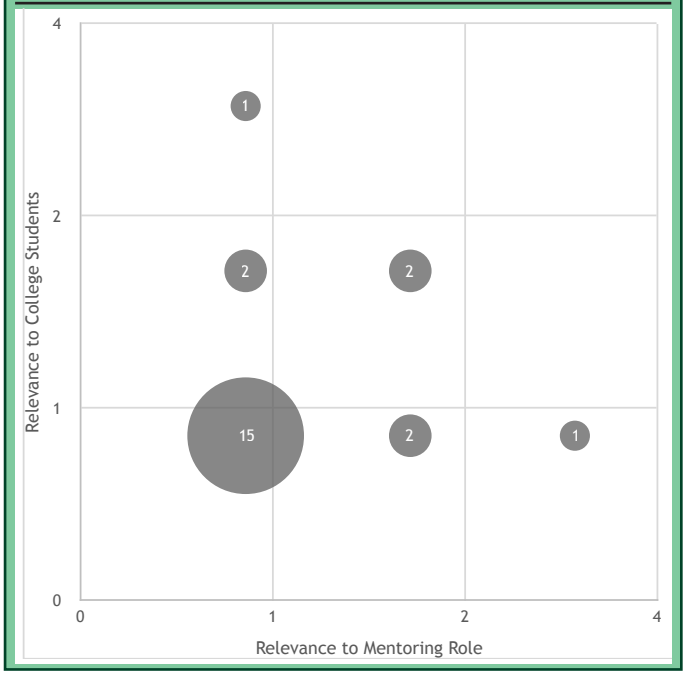
Leadership

Twenty-three leadership instruments were included in the systematic map (Murray, 2017). Price per instrument ranged from $0 to $225, and instrument length ranged from 7 to 100 questions. Leadership instruments were more likely to be published commercially, require payment or membership, and offer external online data collection and management. The 23 instruments scored between 1-3 in both relevance to mentoring role and between college students (Figure 3).

The top three recommended instruments for measuring leadership in college student peer mentors are:

1. Servant Leadership Behavior Scale (SLBS) measures six domains of servant leadership:

Figure 3. Intersection of Relevance Ratings for 23 Included Leadership Instruments



voluntary subordination, authentic self, covenantal relationship, responsible morality, transcendental spirituality, and transforming influence (Sedjaya et al., 2008).

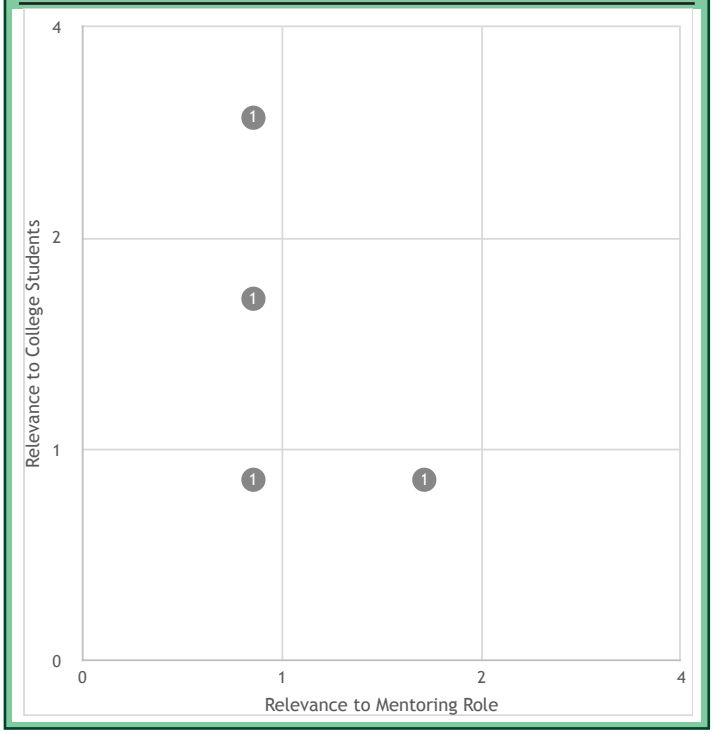
2. Multifactor Leadership Questionnaire (MLQ) assesses transformational and transactional leadership behaviors, including nine factors in the Full Range Leadership Model (Bass and Avolio, 1997).
3. Leadership Practices Inventory (LPI) assesses leadership behaviors related to five leadership practices: modeling the way, inspiring a shared vision, challenging the process, enabling others to act, and encouraging the heart (Kouzes and Posner, 2003).

Professionalism (Employability)

Four employability instruments were included in the systematic map as measures of professionalism (Murray, 2017). None had associated costs, membership or training requirements, or offered multi-rater or other-rater versions of the instrument. Each had published accounts of development and testing. The four instruments scored between 1-2 in relevance to mentoring role, and 1-3 in relevance to college students (Figure 4). Because employability and professionalism relate to the workplace, instruments were not excluded for using workplace language (see Figure 1 for a list of criteria for exclusion). However, instruments that used language referencing future employability were prioritized over those that measured behaviors exhibited during a present employment.

The top three recommended instruments for measuring leadership in college student peer mentors are:

Figure 4. Intersection of Relevance Ratings for 23 Included Professionalism/Employability Instruments



1. Career Adap-Abilities Scale (CAAS) measures career adaptabilities according to career construction theory. The instrument includes four scales: concern, control, curiosity, and confidence (Savickas and Porfeli, 2012).
2. Dispositional Measure of Employability (DME) assesses dispositional employability, or the individual differences related to adapting to work and career environments (Fugate and Kinicki, 2008).
3. Occupational Work Ethic Inventory (OWEI) measures employability skills in three areas: interpersonal skills, initiative, and dependability based on the workforce development model (Hill and Petty, 1995).

Conclusions and Recommendations

Systematic maps allow for the identification of gluts and gaps in research literature on a broad topic (Haddaway et al., 2016). Forty-three instruments were found to be suitable to measure communication, leadership, and professionalism in college student peer mentors and mentees and were summarized in a systematic map (Murray, 2017). Most contextually relevant instruments measured leadership and communication. The systematic map indicated a gap in the literature of professionalism instruments that were relevant to either/both peer mentors and college students. In particular, there is a need for research on instruments that directly measure professionalism in students of agriculture and related sciences. These instruments would allow peer mentoring programs and leadership programs to measure the professional development of students in their programs, providing important data for communication to stakeholders and funding units.

Recommended instruments were identified for all three soft skills. However, none of the 43 identified instruments were rated a composite score of six, which would indicate an instrument that is highly relevant to both mentoring and college students (Table 2). Given the proliferation of peer mentoring programs across the United States, there is a need for instruments that are contextually situated in the college student peer mentoring experience. Novel instruments should be developed that specifically measure these soft skills for college student peer mentors to assess program efficacy and communicate program results to internal and external stakeholders, including prospective employers.

Leadership instruments were the most likely to be published commercially and offer external online data collection and management systems for researchers and practitioners. Publishers of communication and professionalism instruments can look towards the leadership literature for robust models of instrument dissemination, indexing, publication, and commercialization. Doing so may result in the more frequent utilization of these instruments, and the development of new instruments to measure college student communication abilities.

The recommendations of this study are limited by its scope, which included only instruments referenced

in the first 3,200 articles. Instruments and articles that were not indexed or returned by the eight electronic databases were not considered for inclusion. The scoping review was confined to peer reviewed journal articles, which may have excluded practitioner's tools that may be appropriate pedagogical and assessment tools. Additional scoping reviews and systematic maps should be constructed using additional scholarly databases and non-scholarly search engines. Further scoping reviews and systematic maps should be undertaken to assess the state of the literature related to the other variables identified by Crawford et al. (2011) – decision making/problem solving, self-management, hands on knowledges/experiences, and team skills. These additional maps could build upon the maps presented herein, providing a more complete analysis of the literature for assessment decision-making.

Summary

Recommendations for appropriate instruments to measure soft skill development were made based on a hierarchical assessment of psychometric evidence, generalized construct validity, composite relevance to college students and peer mentoring, lowest cost, and fewest questions. Communication in college student peer mentors and mentees can be measured with the Personal Report of Communication Apprehension, the Self-Rated Competence, or the Student Communication Motives Scale. Leadership can be measured with the Servant Leadership Behavior Scale, the Multifactor Leadership Questionnaire, or the Leadership Practices Inventory. Professionalism or employability can be measured with the Career Adapt Abilities Scale, the Dispositional Measure of Employability, or the Occupational Work Ethic Inventory. While multiple, suitable instruments exist to measure soft skill development, none were found to be highly relevant to both peer mentoring programs and college students in general. There is a need for instruments that are contextually relevant to college student peer mentors and mentees. Future scoping reviews and systematic maps are recommended to map instruments published or indexed in other databases, including non-scholarly databases.

Literature Cited

Association of American College and Universities. 2015. Falling short? College learning and career success. https://www.aacu.org/sites/default/files/files/LEAP/2015employerstudentsurvey.pdf. Association of American College and Universities. April 20, 2018.

Astin, A.W. 1996. Involvement in learning revisited: Lessons we have learned. Journal of College Student Development 37(2): 123-34.

Bass, B.M. and B.J. Avolio. 1997. Full range leadership development: Manual for the multifactor leadership questionnaire. Palo Alto, CA: Mind Garden.

Bean, J. and S.B. Eaton. 2001. The psychology underlying successful retention practices. Journal of College Student Retention: Research, Theory and Practice 3(1): 73-89.

Bonin, E. 2013. Effect of peer mentors on academic performance. InSight: Rivier Academic Journal 9(2).

Brown, S.A., E.E. Martin, T.J. Garcia, W.A. Winter, A.A. García, A. Brown, H.E. Cuevas and L.L. Sumlin. 2013. Managing complex research datasets using electronic tools: A meta-analysis exemplar. Computers, informatics, nursing: CIN, 31(6), 257.

Crawford, P., S. Lang, W. Fink, R. Dalton and L. Fielitz. 2011. Comparative analysis of soft skills: What is important for new graduates. Michigan State University and the University Industry Consortium: 1-24.

Crisp, G. and I. Cruz. 2009. Mentoring college students: A critical review of the literature between 1990 and 2007. Research in Higher Education 50(6): 525-545.

Cupach, W.R. and B.H. Spitzberg. 1981. Self-monitoring and relational competence.

Fugate, M. and A.J. Kinicki. 2008. A dispositional approach to employability: Development of a measure and test of implications for employee reactions to organizational change. Journal of Occupational and Organizational Psychology 81(3): 503-527.

Haddaway, N.R., C. Bernes, B.G. Jonsson and K. Hedlund. 2016. The benefits of systematic mapping to evidence-based environmental management. Ambio 45(5): 613-620.

Hall, R. and Z. Jaugietis. 2011. Developing peer mentoring through evaluation. Innovative Higher Education 36(1): 41-52.

Heckman, J.J. and T. Kautz. 2012. Hard evidence on soft skills. Labour Economics 19(4): 451-464.

Hill, R.B. and G.C. Petty. 1995. A new look at selected employability skills: A factor analysis of the occupational work ethic. Journal of Vocational Education Research 20(4): 59-73.

Huber, D.L., M. Maas, J. McCloskey, C.A. Scherb, C.J. Goode and C. Watson. 2000. Evaluating nursing administration instruments. Journal of Nursing Administration 30(5): 251-272.

Jacobi, M. 1991. Mentoring and undergraduate academic success: A literature review. Review of Educational Research 61(4): 505-532.

James, K.L., N.P. Randall and N.R. Haddaway. 2016. A methodology for systematic mapping in environmental sciences. Environmental Evidence 5(1): 7.

Knight, P. and M. Yorke. 2004. Learning, curriculum and employability in higher education. Psychology Press.

Kouzes, J.M. and B.Z. Posner. 2003. Leadership practices inventory (LPI). Leadership development planner. 3rd ed. Sam Francisco, CA: Pfeiffer.

Kram, K.E. and L.A. Isabella. 1985. Mentoring alternatives: The role of peer relationships in career development. Academy of Management Journal 28(1): 110-132.

Levac, D., H. Colquhoun and K.K. O'Brien. 2010. Scoping studies: Advancing the methodology. Implementation Science 5(1): 5-69.

Martin, M.M., T.P. Mottet and S.A. Myers. 2000. Students' motives for communicating with their instructors and affective and cognitive learning. Psychological Reports 87(3): 830-834.

McCroskey, J.C., M.J. Beatty, P. Kearney and T.G. Plax. 1985. The content validity of the PRCA-24 as a measure of communication apprehension across communication contexts. Communication Quarterly 33(3): 165-173.

Murray, K.A. 2017. Exploring the leadership development of undergraduate students of agriculture at The Ohio State University. MS Thesis, Dept. of Agricultural Communication, Education, and Leadership, Ohio State University, 2120 Fyffe Road, Columbus, OH.

Newton, F.B. and S.C. Ender. 2010. Students helping students: A guide for peer educators on college campuses. John Wiley and Sons.

O'Flaherty, J. and C. Phillips. 2015. The use of flipped classrooms in higher education: A scoping review. The Internet and Higher Education 25: 85-95.

Outcalt, C.L., S.K. Faris and K.N. McMahon. 2001. Developing non-hierarchical leadership on campus: Case studies and best practices in higher education. Greenwood Publishing Group.

Pullin, A.S. and G.B. Stewart. 2006. Guidelines for systematic review in conservation and environmental management. Conservation Biology 20(6): 1647-1656.

Robinson, J.S. and B.L. Garton. 2008. An assessment of the employability skills needed by graduates in the college of agriculture, food and natural resources at the University of Missouri. Journal of Agricultural Education 49(4): 96-105.

Robles, M.M. 2012. Executive perceptions of the top 10 soft skills needed in today's workplace. Business Communication Quarterly 75(4): 453-465.

Savickas, M.L. and E.J. Porfeli. 2012. Career adapt-abilities scale: construction, reliability, and measurement equivalence across 13 countries. Journal of Vocational Behavior 80(3): 661-673.

Sendjaya, S., J.C. Sarros and J.C. Santora. 2008. Defining and measuring servant leadership behaviour in organizations. Journal of Management Studies 45(2): 402-424.

Spitzberg, B.H. 2003. Methods of interpersonal skill assessment. Handbook of communication and social interaction skills: 93-134.

Tremblay, P.F. and S. Rodger. 2003. The effects of a peer mentoring program on academic success among first year university students. The Canadian Journal of Higher Education 33(3): 1-17.

Washburn, M. 2008. One mentor or two: An instrumental case study of strategic collaboration and peer mentoring. Journal of The First-Year Experience & Students in Transition 20(2): 91-110.

The Validation of an Instruction Specialization in a Post-Secondary Natural Horsemanship Program

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Abstract

University programs must to be willing to change and adapt curricula based on student needs, workforce readiness, and recommendations from alumni, current students, peers, and industry professionals on how to better prepare students. This study explores the development of an instruction specialization within a post-secondary natural horsemanship degree program. Participants in key informant interviews identified common skills, knowledge, and coursework to be integrated into this new specialization. The primary needs identified were unique hands-on experiences, coursework on teaching and learning strategies, and business competencies, including management, communication and technological proficiencies. Participants also noted that educators must connect coursework with real-world industry experiences through quality internships to help students network in the industry. This new specialization represents a renewed opportunity for equine students to take courses in non-formal instruction, communication, and educational programming. Regardless of the discipline of agriculture, these findings support critical competencies and employment expectations that are becoming more important for all students today. The fundamental experiences of experiential learning, teaching, life-skill development, communication, and working with people apply across fields should serve as a foundation for academic programs. Agricultural programs must continue to market their expertise to attract a diverse student body and expand their impact.

Introduction

The U.S. equine industry has a direct economic effect of $39 billion annually and provides 460,000 full-time equivalent (FTE) jobs in racing, showing, recreation, and other avenues (American Horse Council, 2005). With such a diversity of jobs, post-secondary equine programs must periodically evaluate courses and programs to determine whether they fit students' needs and help prepare them to compete for higher-level jobs. While students in agricultural colleges were once primarily from rural backgrounds, today's students come from much more urban and suburban backgrounds (Anderson, 2009). This demographic shift has required an adjustment in classes to help students gain the practical agricultural experience they otherwise lack. (Bormann and Slough, 2011).

The equine program at the University of Montana - Western (UMW) has seen continuous growth over the seven years of its existence and currently offers a Bachelor of Science degree in natural horsemanship with three specializations: management, psychology, and science. In 2010, 30 students in the program declared a bachelor's degree; by the start of the 2017 school year, 110 bachelor's degree-seeking students were enrolled. One major reason for the program's success is the experiential learning component. Students seeking the bachelor's degree take six hands-on horsemanship classes over four years, including a colt-starting class. These classes require students to bring their own horse to learn new training techniques and develop an understanding of horse psychology. Each class builds on the previous classes and offers opportunities to apply knowledge as the student grows in the program. Students enrolled in the UMW equine program expressed interest in further developing their educational skills in order to be better prepared to teach in the equine industry. This demand led to the idea of creating a new specialization in instruction that would focus on helping students who want more hands-on experience with horses to teach others about horses.

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The mission of the Bachelor of Science in natural horsemanship degree is to provide students with an education in equine theory and science combined with the practical skills of natural horsemanship. Existing specializations- management, psychology, and science- emphasize skills to manage an equine business; behaviors and development necessary for training horses; and anatomy and physiology for horse care and management, respectively. The instruction specialization would emphasize educational methods and principles of teaching horsemanship to others in a non-formal setting. Focus would be placed on developing knowledge in non-formal teaching methods, communication theories, and educational program development and evaluation. Graduates of this new specialization would have the skills and knowledge necessary for the equine training and instruction profession, such as riding instructors or clinicians.

We administered a survey to assess the needs and interests of students already enrolled in the program; responses demonstrated strong student desire for the proposed instruction specialization. Students wanted the specialization to include coursework in program development and evaluation, business and educational principles, communication processes, and theories of teaching and learning. Based on this positive needs assessment, we began developing an instruction specialization within the UMW Natural Horsemanship Program with the goal of educating students to master the fundamental horsemanship, business management, and equine education skills necessary to succeed in the equine training and instruction profession. This study explores the development of the instruction specialization in UMW Natural Horsemanship Program. To develop the new specialization, we first had to describe: (1) current, related post-secondary equine programs, (2) equine professionals' employment expectations, and (3) alumni perspectives of essential work skills.

Methods

We interviewed these three groups of key informants—equine program directors, horse professionals hiring graduates, and UWM equine program alumni—using questions based on previous literature (Antilley et al., 2010; Cavinder et al., 2009; Potter et al., 1989) and integrated these responses with the results of an internal student needs assessment. The questions were reviewed by an academic panel of experts to establish face and content validity (Dillman, 2000). The Montana State University Institutional Review Board approved the study protocol and all participants provided written informed consent prior to participation. This study was deemed exempt by MSU Institutional Review Board. We conducted phone or in-person interviews of between thirty and sixty minutes with five post-secondary equine program directors, six equine professionals, and five program alumni. Each person interviewed was asked the same open-ended questions in a semi-structured interview process with modifications based on their role in the study (Merriam, 2009).

Equine Programs

We chose five post-secondary equine programs by limiting ourselves to those offering classes in a variety of equine disciplines that, like the UMW program, emphasize experiential learning. All the program directors chosen had experience in teaching hands-on equine classes and preparing students for industry employment. Although the programs had a range of focuses, from professional showing to working cattle, each contributed a unique perspective on horsemanship and student preparation. Three programs were located in the West and two in the Midwest. This was crucial because of the large population of out-of-state students coming from these areas to the UMW Natural Horsemanship Program.

Equine Professionals

The six equine professionals were chosen because of their individual knowledge in natural horsemanship and their ability to provide student internships and job placement in the equine industry. Five of the professionals had conducted horsemanship clinics throughout the world and shown horses professionally. All six had the background to assess the focus for this degree option based on instructional skills, employment expectations and career knowledge. Therefore, it was important to assess their perceptions of students' preparedness, thoughts on coursework in equine programs, and advice on preparing to enter the equine industry.

UMW Program Alumni

All UMW alumni participants were selected because they had received a Bachelor of Science in natural horsemanship from UMW at least three years previous to their participation in the study and were gainfully employed in the equine industry at the time of the interview. We asked questions about their experiences in the Natural Horsemanship Program, employment opportunities, and suggestions for the curriculum with regard to graduate preparedness, thoughts on the proposed instruction specialization, and advice on how to better prepare students to enter the industry.

Data Analysis

All interviews were audio-recorded with permission and later transcribed. The researcher reviewed the hand-written notes and made edits for clarification immediately following the interview, then reviewed the audio recordings. Transcription accuracy was ensured by asking participants to review the transcripts of their own interviews (Creswell, 2014). Key quotes were then organized by question and additional data with potential importance for the topic were also noted. Once the data were organized, data were analyzed using content analysis to identify trends (Patton, 2002). The researcher reviewed each question individually and identified common words and phrases within and then across the

interviews. These terms were then grouped into categories in order to find relevant themes. Useful themes—both positive and negative—were highlighted and analyzed. Finally, dependability was addressed using peer examination of coding procedures and analysis as well as inter-rater reliability checks, as themes were verified with professors and the equine program's department chair (Denzin, 2006; Guba, 1981; Merriam, 2009).

Results and Discussion

Objective 1: Describe current, related post-secondary equine programs

Directors of all five equine programs agreed that their students are interested in instructing horsemanship and that "training and teaching go together." When asked about the training methods or theories taught in their courses, Western-discipline programs taught newer natural horsemanship techniques and methods (using the psychology of the horse to train), while English disciplines taught more traditional methods and techniques (looking at the physical side of the horse to train). All emphasized that keeping current with industry standards was crucial for their programs and for their students' success. It was also critical to give students as much outside exposure to trainers and methods to make them more well-rounded equestrians. Two programs required students to maintain a 3.0 GPA and 90% or above on their equine exams to stay in the program. Most programs included both lecture classes and experiential lab courses.

The educational value of hands-on and real-life experiences with horses was stressed by all directors. Four of the directors said that hands-on classes are the basis for their programs because they strengthen students' skills for future employment. All agreed that more coursework in education and business would be extremely valuable. Courses must be designed to get students motivated and ready to enter the industry. Overall, directors said that connecting coursework with real-world industry experiences will help prepare students better.

Cultivating industry connections and "getting students with equine instructors and clinicians" were also deemed essential. Most directors said that quality internships matter. One director said, *"Students do not ride enough. Placing students with high-end trainers and high-quality internships is a big deal for success."* In addition, faculty must be current with trends and involved with the industry outside of the program. One director said, *"I do not think we can give them what they need in a university environment. They need to get out in the real world and they need a certain amount of that before they graduate."*

Objective 2: Describe equine professionals' employment expectations

Equine professionals described work ethic, good attitude, and a love of horses as the most important attributes for hiring. A professional stated *"I want them to have common sense, the ability to speak with people especially the new type of horse owner that is not very knowledgeable… they must have patience and a business sense."* It is becoming tougher to find this person, as one participant declared, *"You can't get a job with no experience, but you can't get experience without a job."*

When asked about the preparedness of equine graduates entering the horse training industry, equine professionals agreed that students need to see and experience the industry in the real world to gain a realistic view of what it takes to maintain a successful business. Many students don't realize how much they need to learn to reach that level. Students need to realize the time and commitment necessary to be successful in their careers.

There was an identified need for more people with instructional and training skills. As one participant stated, *"People are less knowledgeable about a horse, so there's a need for basic level horsemanship."* Skills on how to work with people are becoming more important as *"future horse owners are concerned about things that the baby boomers took for granted, trust in everybody. With a shift of social responsibility about mothers being concerned about safety of their children, certified by something that is recognizable."*

All professionals agreed that coursework in education and business would better prepare students. Education courses were critical as described by many: *"You cannot have too much education. Education should never stop," "Verbalizing to someone else helps you learn,"* and *"When you have to teach someone else to do something, you're learning. Teaching is learning and how you express your thoughts."* Additionally, strong business skills and relationships were necessary to build a successful business. *"Human relations are hard to get in a classroom."* The changing nature of the horse business was discussed: *"The days of a cowboy horse trainer is over, and it is more about professional business relationships."* Because of this, hands-on experience and internships were considered essential for learning. *"It's easy to learn the science but the practical knowledge experience is harder to learn."*

Students pursuing a career in equine training and instruction were advised to have a good work ethic and to find a mentor in the industry to help continue their education. One professional said, *"By the third year of school, they must put the pedal to the metal, so they can hit the ground running after college and be a real asset in industry."* The need for quality interns and employees was expressed by all professionals.

Objective 3: Describe alumni perspectives of essential work skills

Equine program alumni felt the Natural Horsemanship Program had given them a good foundation with horses, but they felt they needed an additional level of horsemanship to help them get a job. There was also an identified need for business courses to educate in the areas of advertising, liabilities, and current equine

industry standards. Business classes on financial management, technology skills, and problem solving were also highlighted as academic needs. All agreed that gaining more experience through internships was critical to being prepared.

Alumni emphasized the need for teaching skills: *"When you actually have to teach it to somebody, it really takes it to another level."* The need for an instruction specialization was agreed upon by all. *"There is a need for teaching in the industry, having the ability to teach helps."* The inclusion of teaching into the program was considered a positive advancement: *"Education is important, if you know enough about something the best way to know if you know it is to teach it"* and *"I think specific training would be helpful in our industry. I think a lot of gifted people are good at communicating with horses but not necessarily with people, I think there is a big void there."*

Summary

University programs must be willing to adapt curricula based on student needs and workforce readiness, tapping alumni, current students, other academic programs and industry professionals for recommendations on how to better prepare students. This study summarizes the needs identified by three stakeholder groups that must be met in a new instruction degree specialization at the University of Montana - Western. Like Long and Morgan's (2010) study, participant groups identified three primary needs: unique hands-on experiences, coursework on teaching and learning strategies, and business competencies, including management, communication and technological proficiencies.

Unique Hands-On Experiences

All groups of participants stated the critical need for students to have hands-on experiences with horses and people to better prepare them for employment, as students may not have practical knowledge of horsemanship. The degree specialization must offer courses that incorporate more hands-on experiences with horses and teach basic-level horsemanship and safety, including halter-breaking young horses, starting colts, and ranch horsemanship skills. Participants agreed that a variety of experiences during the program would help students have a higher chance of success in their internships and careers. Participants understood that real-world experience is difficult to obtain, but classes and internships should partner with industry to help students develop technical, networking, and life skills.

Coursework on Teaching and Learning Strategies

With the emphasis on instruction, students must acquire a comprehensive understanding of how to teach others. Specialized instruction internships would help students gain real-world experience and network in the industry by making connections. A key point mentioned by all participants was that experience develops knowledge. Different situations require different teaching methods; therefore, students must learn a range of teaching methods. The specialization must also include opportunities for students to study learning styles, learn instructional strategies, and instruct horsemanship lessons with applications to different learning environments and audiences. This new specialization represents a renewed opportunity for equine students to take courses in non-formal teaching methods, communication, and educational programming. Including equine students in more non-formal educational courses and experiences also needs to be explored.

Business Competencies

Strong business skills, work ethic, a good attitude, and relationship building were all considered necessary to get a job and build a successful business. Students must know how to start or manage an equine-related business with foundational knowledge in accounting practices, financial statements, business structures, and management skills. Knowing the fundamentals of starting and operating a business is key for business success and longevity.

Participants in the study unanimously stressed that technology is always changing, even in the equine industry. Equine graduates need to develop different types of communication strategies and marketing techniques to advertise to and communicate with changing clientele. These technological trends must be taught in courses by using software programs to create sale catalogs, advertisements, and other marketing media. Agricultural communications courses offer a perfect venue to develop these skills and should be marketed more frequently to equine students.

Future research should examine the development of this specialization and how it integrates the findings of this research. A longitudinal study of students in this specialization should be conducted to track skill development, satisfaction, and internship and job placement. A follow-up study with equine professionals on observed changes in students' knowledge and skills should also be investigated.

This research approach can be used to assess current trends and the needs of any educational program to ensure that it is properly preparing graduates with the necessary skills and knowledge. Regardless of the discipline, the findings in this study support critical competencies and employment expectations for all students. It is the responsibility of university educators to be aware and knowledgeable of current industry trends to better prepare students for the workforce. The fundamental experiences of experiential learning, teaching, life-skill development, communication, and working with people apply across fields should serve as a foundation for academic programs. Agricultural programs must continue to market their expertise in these areas to attract a diverse student body and expand their impact.

Literature Cited

American Horse Council. 2005. The economic impact of the horse industry on the United States. http://www.horsecouncil.org. January 15, 2016.

Anderson, K. 2009. Undergraduate horse industry study tour enhances experiential learning. NACTA Journal 53(4): 18-22.

Antilley, T.J., G. Briers, C.A. Cavinder, D. Davidson, P.G. Gibbs and D. Sigler. 2010. Educational value of horsemanship clinics to youth and adult riders. Journal of Extension 48 (6).

Bormann, J.M. and T.L. Slough. 2011. Field trip to racetrack enhances classroom experience. NACTA Journal 55(4): 59-64.

Cavinder, C.A., P.A. Evans, N. Jack, K. Jogan, S. Gagon, M. McMillan, A. Scott and K. Waite. 2009. University students may be better prepared for life after working with horses. NACTA Journal 53(3): 37-43.

Creswell, J.W. 2014. Research design qualitative, quantitative, and mixed methods approaches. 4th edition. Thousand Oaks, CA: Sage Publications, Inc.

Denniston, D.J. and M. Russell. 2007. Use of an online survey to measure an equine program's alumni satisfaction. NACTA Journal 51(2): 2-4.

Denzin, N. 2006. Sociological methods: A sourcebook. 2nd ed. New York: McGraw-Hill.

Guba, E.G. 1981. Criteria for assessing the trustworthiness of naturalistic inquiries. Educational Communication and Technology Journal 29: 75–92.

Long, R.E. and A.C. Morgan. 2010. The elements of the two-year equine degree programs in the mid-Western U.S.: A Delphi study. NACTA Journal 54(2): 2-10.

Merriam, S.B. 2009. Qualitative research. San Francisco, CA: John Wiley and Sons, Inc.

Patton, M.Q. 2002. Qualitative research and evaluation methods. 3rd edition. Thousand Oaks, CA: Sage Publications, Inc.

Potter, G.D., M.M. Vogelsang and S.P. Webb. 1989. A hands-on method of teaching horse training skills to students of varying levels of experience. NACTA Journal 33(2): 45-47.

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Personal Interviews as a Means of Obtaining Student Evaluation of Teaching Quality

Franklin E. Eldridge

INTRODUCTION

Measure the quality of the teachers in a college and you have measured the quality of the college.

Recognize and reward high quality teaching and the quality of teaching in a college will rise. good teachers will become better. and young scholars will aspire to become teachers.

These statements seem obvious in their simplicity. The complex key to making them work lies in the first clause "measure the quality of the teachers". The measurement is complex because teaching is a complex activity. The difficulty of measurement, however, cannot be an excuse, for measurement of quality cannot be avoided. The chairman of a department or the director or dean of a college can discuss methods, debate purposes, and argue about the values. but when promotions are being considered and budgets are being made they must make decisions about quality of teaching. If their decisions are correct and logical. the morale of the staff will rise. If these decisions are wrong, or if they are avoided (which can easily be worse than being wrong), morale will suffer and the quality of teaching will drop. The search for reliable methods for evaluating quality in teaching, therefore, is crucial.

METHODS OF EVALUATION

In any process of evaluation, the first step is to state objectives in measurable terms. When teaching quality is being evaluated it is first necessary to identify the characteristics which are accepted as indicators of good teaching. These characteristics then need to be stated in terms which will permit measurement of the degree to which they are accomplished. Many lists of characteristics, or rating scales, have been developed (1) (2) (3) (4). Similar lists may have been made up in your own college. These scales can be used to obtain comparative. numerical estimates of teachers. The simpler ones, which have proven reliability, are particularly useful. These rating scales are frequently used by teachers for self-evaluation and self-improvement without submitting them to the dean or department chairman.

Deans or directors commonly depend upon recommendations or ratings made by departmental chairmen. This has the advantage of placing responsibility on the supervisor who is most closely associated with the work of the person being evaluated. The chairman has an occasional opportunity to observe the teaching in a classroom, to visit with students who are taking the courses, and to talk with the colleagues of the instructor. One drawback of this method is the rather common lack of an organized, objective approach to evaluation by the chairman.

A less desirable basis for evaluation which frequently is given undue weight in making administrative judgments is one I will call "critical incidents". This method relies upon those situations which come to the attention of an evaluator because they are outstandingly good, or bad, but which may not reflect with any degree of accuracy the consistent teaching pattern of an individual. Frequently these incidents are reported over a cup of coffee, perhaps with pride or perhaps as a humorous episode. Almost any consistent, organized attempt at measurement is superior to "critical incidents".

Student evaluations of teachers have been both praised and condemned. McKeachie (5) published an excellent and extensive review of student ratings. Different student bodies may have different sets of objectives and, therefore, rate faculty members differently (6). High achieving students may differ from low achieving students in their views of what they think is quality in teaching (7). Students may give an instructor a different (more unbiased) rating after grades have been assigned than before, or when the ratings are signed or unsigned.

Critics of student evaluations say the students have too little experience, or are seeking entertainment more than education, or name only the popular or easy teachers, or that they really don't know what is best for them. Proponents point to the student as the ultimate consumer, the customer, the client or the buyer of an education and, therefore, the most interested and best qualified to judge. Others point out that the student is the closest to the performance of the instructor and, therefore, most able to evaluate consistently. Students will vary on how conscientiously they try to evaluate an instructor.

Dixon (8) stated that, "The experience of nearly thirty years at Antioch suggests that students' judgments of teachers are on the whole supplementary and complementary to the judgments of faculty colleagues. Only students are in a position to observe and contrast teaching abilities and styles. On the other hand, students deeply respect faculty members' judgments of their colleagues' scholarly and research qualification." Student evaluations of teaching quality may be obtained in different ways, including personal interviews by the teacher or by other persons.

Personal interviews are viewed with greater or lesser degrees of confidence, depending upon many factors including; purpose for the interview, bias of the interviewer, objectivity of questions asked, etc. McMurray (9) states, "One of the principle criticisms leveled at the interview has been that its findings are highly subjective. While there is no denying that interviewers' judgments must, of necessity, be subjective, it does not follow that they must lack reliability and validity simply because they are subjective. Subjective judgments are not necessarily wrong."

The most perfect estimate of future performance in teaching is an accurate measure of past performance. Even this method is not perfect, because (a) conditions in the future are never exactly the same as in the past and (b) different measurements of past performance will vary. Probably one of the reasons for skepticism about the use of personal interviews is the fact that they are usually used to predict future performance and, therefore, include both of the previously listed sources of variation. Some improvement in confidence in the use of personal interviews might be gained if it were recognized that the interview (or any other method of evaluation) is an attempt to measure past performance. Future performance can then be estimated with the recognition that unknown sources of variation will cause the correlation to be less than 1.0, the level of perfection for which we always strive.

Furthermore, the evaluation of teaching quality should use not one but all methods available in attempts to obtain the most accurate measure of past performance. Opinions and numerical estimates of quality should be obtained from department chairmen, colleagues, and students at all levels of achievement. Final decisions and component parts of evaluative instruments should be recognized as subjective judgments which have real meaning and value. These measures of past performance can then be used with some degree of confidence as predictors of future performance.

PERSONAL INTERVIEWS OF STUDENTS

Each year for over 14 years the University of Nebraska has given one or more Distinguished Teaching Awards which carry public recognition and a check for a thousand dollars. Nominations for the award are made by each college, annually.

In the process of making nominations from the College of Agriculture and Home Economics a procedure using personal interviews with students was developed which has become invaluable as a means of evaluating quality of teaching. In addition to selecting one or two nominees this process has yielded a body of information concerning the quality of teaching done by many members of the faculty, which has been used when considering promotions and when making annual budgets. This procedure is described in this report.

Each of the five committee members has interviewed from 10 to 15 students selected randomly (using a table of random numbers) with respect to grade point average, excluding recent transfers and persons interviewed in previous years. In some years students were selected from sophomore, junior and senior classes, and in other years they were selected from junior and senior classes only. From 50 to 75 students were interviewed per year from a student body which now has over 2000 undergraduate students and which has doubled in size in the last 10 years. Over a six year period more than 300 students have been interviewed.

In order to encourage consistency among interviewers the following interview schedule was developed.

STUDENT INTERVIEW SCHEDULE
for
Distinguished Teaching Award

I. During your attendance at the University you have come into contact with quite a few different teachers. You have formed opinions about their teaching. As you think back about different teachers you have had, what did you like about these teachers? What are the Characteristics which make a teacher a good teacher? Just tell me what you think about as you consider good teaching. (Allow time for student to express himself fully.)

Subject matter:

Teaching methods:

Personality traits:

Other Comments:

II. Are there some negative factors which you believe should exclude a teacher from being considered for a Distinguished Teaching Award: What are these factors?

III. Recognizing that most teachers do not measure up to set standards for an ideal teacher, we would like to have you name one or more teachers from the Ag College faculty that you think would logically be eligible for a Distinguished Teaching Award. Give some specific reasons for each person you name.

1.

2.

3.

IV. To what extent do you believe your opinions are shared by the student body as you are familiar with them?

Are there any other faculty members that you have heard other students mention that you think might represent distinguished teaching?

The order of the questions in the interview schedule was intended to cause the student to think first about ". . . . the characteristics which make a teacher a good teacher." By asking this question before asking for nominations we hoped to minimize any tendency to nominate "popular" or "easy" teachers and focus the student's attention upon those general attributes of teaching which further his real educational goals. After our first year's experience with this, we realized the need to record the student's statements as nearly verbatim as possible. Paraphrasing his replies, condensing his statements, or trying to interpret his meaning led to an injection of the interviewer's personal biases. Analysis of the statements was not made easier by recording them verbatim, but analysis was considered to be a secondary consideration at the time that the interviews were being held. The sub-headings "Subject matter", "Teaching methods", etc. were only for the interviewer's convenience in categorizing replies and were not mentioned to the students as topics which needed to be covered. One interviewer (FE) assigned number one to the first characteristic named by a student, number two to the second, etc., and these priorities were considered to reflect the importance assigned by the student to each comment. Review of the distribution of the answers revealed that listing by priority had little significance.

The statements given by the students were grouped under some general description of characteristics. The frequency of the statements were then used as an indication of the relative importance of the characteristic. Selection of general characteristic descriptions was not simple. Some statements would fit under more than one description. These groupings indicate the importance of certain characteristics to the students. The most frequently expressed idea, **Interested in students**, is listed first below and following this idea are some typical statements.

Interested in students

"Takes interest in students, helps with problems"
"Personal interest in students"
"Outgoing, likes young people"
"Instructor has to care about the students"
"Personal identification with students"

The characteristic description under which the second largest number of statements was made was:

Makes the course interesting or challenging

"He can hold my attention – makes the course interesting so you want to go to class next time"
"Makes a required course interesting"
"Be able to make the class interesting"
"Makes a class atmosphere that causes a student to want to go to class – informal"
"Challenges a student to learn, not earn a grade"

The next three characteristics were about equal in the frequency of supporting statements.

Interest in and knowledge of the subject

"Know what they're talking about"
"Should be interested in his subject and convey interest to the student"

Organization, preparation, clear presentation

"Material clearly outlined"
"Lecture should be easy to follow, follows an outline"
"Organization"
"Well prepared and organized"
"Organized and orderly"

Gets the subject matter across

"Being able to put the subject material across in an understandable manner"
"How well they get the subject matter across"

Some students also mentioned tests, fairness, communication, breadth of knowledge, personal experience and a number of other items or statements not fitting under the above listed headings.

The negative factors named by students had only limited value. Frequently they only reflected the opposites of the desirable characteristics of a good teacher. Some students, however, were more articulate in expressing their views in opposition than positively. Also the negative statements occasionally were more specific or more detailed than the positive statements concerning desirable teaching traits.

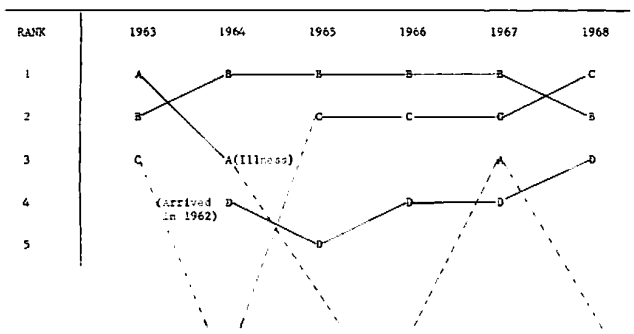
In 1967 the group of 50 students interviewed from the junior and senior classes were further analyzed. The juniors had had an average of 7.7 different teachers from the College of Agriculture and Home Economics and the seniors had had 11.8 different teachers from this college. A total of 41

different teachers were named out of a teaching faculty of approximately 132 persons. Memory was a factor since more than half of the persons named as first choice had been an instructor in the most recently completed semester. The same relationship held true among those designated as second choice. The nomination of an outstanding teacher was apparently easy for some students and difficult for others. This probably reflected personality differences in students as well as other factors.

Even though a large number of faculty members received one or more mentions each year, the consistency from year to year among those at the top of the list was noteworthy. Figure I illustrates this consistency.

Figure I. Rank of top 4 faculty members by years, by number of points (3 points for 1st nomination by student, 2 points for 2nd, 1 point for 3rd).

Note consistency of ranking from year to year, and certain identifiable reasons for change. The selection is from a faculty of about 132 members. Usually about 40 persons received one or more nominations.



DISCUSSION

When dealing with an issue as complex as evaluation of teaching quality it would be unwise to expect a single method to provide a solution. In the method presented in this report, personal interviews of student, considerable reliance was placed upon the number of students interviewed and the degree to which the sample was representative of the student body. In a similar manner, the results from the interviews were combined with other information before the nomination for Distinguished Teaching Award was made and before these results were used in any other evaluations. Experience has also shown that evaluators, such as the dean or department chairman, have biases they constantly must guard against. Once an opinion is formed it is easy to "hear more loudly" the supporting evidence than the dissent.

The consistency of evaluation from year to year has been a feature of this method that builds confidence in its validity. A method used earlier was to request voluntary nominations from students, alumni, staff and graduate students. Frequently this method resulted in "campaigns" for some one person. Usually these could be identified because they came mostly from one floor of the dormitory, or one fraternity or one group of majors. A representative sample helps eliminate this bias which often reflects popularity instead of genuine teaching quality.

By continuing an organized personal interview system for several years two other factors related to evaluation of teaching quality were recognized. One was the effect, temporary or permanent, of changes in physical or emotional health as a factor causing a change in teaching quality. For example, a highly regarded instructor who encountered a temporary physical health problem was not listed by his students in the same terms as before. Instead there were negative comments, such as "short-tempered" or "not available for discussion", etc. The second factor which was recognized was related to the speed with which teaching quality can be measured. So often it is said that it takes a lifetime to establish a reputation as a teacher. It doesn't. Through personal interviews top teachers can be identified by the completion of their first year. Combining results for several years reveals trends and permits increased confidence based upon consistency of reports.

SUMMARY AND CONCLUSIONS

Personal interviews of a representative group of students have been held for several years in an attempt to evaluate teaching quality. The results appear to be consistent from year to year and in agreement with other measures of quality.

Student opinions of good teachers and good teaching characteristics are valuable as one part of a total teacher evaluation program. Properly weighted and analyzed they may be the most valuable measure. They can be effectively used in rewarding excellence in teaching. Because of the experience and results, a system of personal student interviews is recommended as a part of the teacher evaluation process in college.

LITERATURE CITED

1. Belknap, Robert H., Greenblatt, Edward L., Heimler, Charles H., Marion, Arthur J., Wyeth, Ezra R., Guidelines for Promotion, IMPROVEMENT OF COLLEGE AND UNIVERSITY TEACHING, 13(1):14-15, 1965.

2. Cosgrove, Don J., "Diagnostic Rating of Teacher Performance", JOUR. OF EDUCATIONAL PSYCHOLOGY, 50(5):200-204, 1959.

3. Hoffmann, Randall W., "Students Portray the Excellent Teacher", IMPROVEMENT OF COLLEGE AND UNIVERSITY TEACHING, 11(1):21-24, 1963.

4. Renner, Richard R., "A Successful Rating Scale", IMPROVEMENT OF COLLEGE AND UNIVERSITY TEACHING, 15(1):12-14, 1967.

5. McKeachie, Wilbert J., "Student *Ratings of Faculty*: A Research Review", IMPROVEMENT OF COLLEGE AND UNIVERSITY TEACHING, 5(1):4-8, 1957.

6. Pogue, F. G., Jr., "Students' Ratings of the Ideal Teacher", IMPROVING COLLEGE AND UNIVERSITY TEACHING, 15(2):133-136, 1967.

7. Spaights, Ernest, "Students Appraise Teachers' Methods and Attitudes", IMPROVEMENT OF COLLEGE AND UNIVERSITY TEACHING, 15(1):15-17, 1967.

8. Dixon, James P., ANTIOCH NOTES, 45(7). April, 1968.

9. McMurry, Robert N., "Validating the Patterned Interview" from "Studies in Personnel and Industrial Psychology" Edited by Edwin A. Fleishman, The Dorsey Press, 1961.

Using a 30-Day Challenge to Apply Planned Change Concepts

Introduction

For the past three years, I have taught a graduate-level Methods of Planned Change course, based primarily on Rogers' Diffusion of Innovations (2003). For the past three years, I have had students participate in a 30-day challenge assignment. Over those 30 days, they were to engage in the same challenge (e.g., 10,000 steps per day, drinking 64 ounces of water, etc.) each day. The class prepares students to be change agents after they graduate. The purpose of the assignment is to help students better understand the challenge individuals face as they go through changes. Students can ground course concepts in a practical experience. The assignment also provides a safe place for students to risk failing at the goal without failing the actual assignment.

Procedure

At the beginning of the semester, students are given the following instructions for the assignment: They need to choose a daily goal that is something they know they should be doing but are not. The assignment is due about six weeks after class begins, so students need to choose their challenge early to have time to complete the challenge and write up their reflections.

In their reflections, they document the change, including why they chose the goal, barriers for being successful, and what helped them be successful. The reflection also requires the incorporation of course concepts throughout the discussion. In addition to the reflection, students share their results with the rest of the class in a brief two- to three-minute presentation. At the end of the term, a final exam question relates to the 30-day challenge to allow more reflection on the long-term stickiness of the change and any other thoughts students have after more time to reflect on their experiences.

Results

Results have been positive. The students have been fairly engaged in the assignment, and informal feedback has shown that participation in the assignment can have effects beyond the semester. Most students do not maintain their goals past the 30-day limit, but final exam answers have illustrated the assignment had many students adjusting their goals to be more sustainably integrated in their lives.

As with any assignment, there are sometimes where students do not perfectly complete the stated directions of the assignment, but they get the intention of the assignment. One issue is choosing a daily goal. One or two students each time will end up choosing a goal that is not actually a daily goal. There are also one or two who will choose more than one goal. The majority stay within the one daily goal parameters. Another issue is there will be some who fear that failing the goal means they fail the assignment. In an age where there is heightened sensitivity to grades, as well as grade inflation over the span of decades, this is not unexpected, but it can be mitigated if the goals of the assignment are communicated properly. Neither of these have been key issues, but they have occurred.

One unexpected outcome of the assignment was the amount of weight loss that has occurred. Many students gravitated toward health-based goals, so losing weight resulted for many students, though it was not required to share this in the reflection or presentation to the class. While not an intended result, it was encouraging to see real-world outcomes of the assignment.

Recommendations

For anyone implementing a similar assignment, it is recommended to ensure students go after goals that are attainable but are still difficult enough to allow for the possibility of failure. Part of the assignment is to help the students be empathetic toward the people they will potentially be working with in the future. Clarity of instructions is also important as students select goals. Otherwise, let students choose their own parameters. This allows for more buy-in.

This assignment is not necessarily appropriate for all courses, but there are aspects that can be of use to instructors. This assignment goes beyond applying the content to a real-world setting to applying it to the students' actual lives. They are not just seeing course concepts in action; they are seeing course concepts in their lives. This creates a different type of engagement with the material. In this case, students are getting to choose something that betters their lives, hopefully, while also completing required coursework. Basically, find a way to tie your course material to their lives in a meaningful way.

References

Rogers, E.M. 2003. Diffusion of innovations. 5th ed. New York, NY: Free Press.

Submitted by:
Quisto Settle
Oklahoma State University

Using Internet-based Guest Interviews as a Classroom Activity

Introduction

I typically host guest speakers in my undergraduate Agribusiness Law course. While students report enjoying the activity, using guest speakers can be a challenging administrative task. Difficulties include finding speakers who have time to prepare a presentation and travel to campus, scheduling speakers, and engaging students in guest speaker sessions. To combat these challenges, I used an online video conferencing tool to bring guest speakers into the classroom. Rather than asking guests to give a presentation, I had students interview the guests. My expectation was that video conferencing would reduce the time commitment for speakers and ease scheduling problems, while the interview approach would increase student learning and engagement.

Procedure

I scheduled the activity at the beginning of the semester to introduce students to agricultural law and the roles attorneys play in the agricultural arena. Six attorneys accepted my invitation, each representing a different legal career such as working in small and large private practice, non-governmental organizations, academia, and private corporations. After sharing names and job titles of each guest, I allowed students to choose a guest to interview and organized students into groups according to guest selected. Groups met during class to prepare for the interviews, which were conducted on a separate day. I provided each group with information about its guest and encouraged the groups to conduct additional research on the guest and the guest's employer. At the end of the group meeting, each student had to submit a question to ask the guest. One student in each group volunteered or was chosen as the group leader and was responsible for compiling the questions and later conducting the guest interview.

Because I had familiarity with the platform, I used Zoom (https://zoom.us/) for the guest interviews. Zoom is an internet-based videoconferencing tool that allows linked parties to see and hear one another. Paid subscription plans are available, but I was able to use a no-cost plan, which allows unlimited one-to-one videoconferencing. Each guest had a computer with internet access, a camera and a microphone, all required for the Zoom application. An Information Technology staff member taught me how to use Zoom with the classroom equipment and helped me run a practice test with each guest. We conducted the practice tests without incident.

On interview day, I connected by internet to each guest for a 15-minute interview at a specified time. The students viewed the guest on a large projection screen and the guest could see the students on the guest's computer screen. I introduced each guest to the designated student interviewer, who conducted a 10-minute interview using the group members' questions. Other students had the opportunity to ask additional questions in the remaining time.

At the end of class, I conducted a "minute paper" assignment that required students to write about "one new or unexpected thing you learned about agricultural law or agricultural attorneys as a result of the guest interviews." I led a discussion on the same topic to conclude the class session, and asked students to share immediate reactions to the activity. Each group leader submitted the group's interview questions with each student's contribution noted. The minute paper and interview question counted toward a student's final grade.

Assessment

I observed a moderate level of student excitement about the interviews. Student evaluations supported my observation. In response to an evaluation question asking students to explain three of the most beneficial class activities, 43 of 64 students (67%) noted the guest interviews. Explanations for their choices included:

- "Liked getting to see the real world."
- "Very cool to talk to someone in Washington, DC."
- "A nice switch from lectures."
- "Made me more interested in the class."
- "I like that we got to ask questions instead of them do[ing] all the talking."
- "Great not to look at more PowerPoint."
- "All professors should do this to give us a break from lectures."

In response to the "minute paper" assignment, students offered the following:

- "I didn't even know there were agricultural lawyers."
- "I had no idea big farms have attorneys."
- "It made me see that being an attorney is more than doing trials like on TV."
- "Some of them were even funny, which I didn't expect."
- "They really can make a difference in what happens to farms."
- "I didn't know they had to go to school so long."
- "Agricultural law is really diverse."

Managing the interviews was more challenging than I expected, not due to the technology but because I scheduled interviews back-to-back and was not entirely graceful in juggling multiple connections. In my follow up with guests, each reported the technology as easy to use, liked being able to see the class and appreciated simply interacting with the students without any preparation.

I noted several improvements to classroom instruction. Using the internet allowed me to expand my speaker base and bring in guests from across the country. Many of the comments suggested that students gained a greater appreciation for law and attorneys, an unanticipated result. I observed a much higher level of student participation in comparison to a live guest speaker with a prepared presentation, a difference I attribute to the student-driven interview approach and the use of active

group work. Despite these strategies, a handful of students did not appear to engage in the group work and did not submit interview questions. One reason for this result may have been the large size of the groups, which averaged around ten students.

The internet-based guest interviews will remain on my course syllabus, with a few minor changes. I'll continue to use the Zoom application for the interviews but will schedule breaks between consecutive interviews to avoid complications with technology management. To broaden learning impact, I'll conduct guest interviews throughout the semester rather than compressing them into one class and I'll select guests with specific content expertise to coincide with topics studied later in the semester. Offering more interviews will also allow me to reduce the group size, which could enhance student participation.

Submitted by:
Peggy Kirk Hall
The Ohio State University

Steps to Develop a Flipped Apparel Construction Course

Introduction

Apparel construction can be a challenging course to teach due to the various skill and learning levels of students, lengthy course goals and objectives, and the time allotted for college-level courses. The instructor must be highly prepared, skilled and extremely patient to teach several novice "seamstresses" the skills needed for success in the apparel construction course and required in future upper-level apparel design courses. The instructor must design a course that is well organized, efficient and focused on student learning and skill building.

Redesigning a traditional apparel construction course into a flipped classroom initially requires significant effort; however, the results are extremely beneficial to students and professors. Students currently enrolled in a college-level apparel construction and evaluation course are required to complete readings, review selected technique videos, and complete computer-graded learning activities or quizzes as homework. Graded activities and quizzes are included in final grades. This approach requires students to review assigned information more critically and once in class, the instructor can answer any questions and provide demonstrations of the construction technique(s) introduced in the previous homework. The flipped pedagogic approach incorporates active learning with technology while allowing critical class time for skill development and problem solving. While this does not eliminate the need for direct instructor to student instruction, it does increase the number of students that can more confidently move forward.

Procedure

The steps involved in developing a flipped apparel construction course are as follows:

1. **Organization of Course Content.** The instructor must design a course that is well organized. Creating and sharing a course schedule with students that list the daily learning objectives, related readings and videos, learning activities and homework to complete BEFORE attending class is invaluable. The course website or learning management system used such as Blackboard should mirror the course schedule.
2. **Set Daily Construction Goals for Learning Specific Techniques.** List 1-3 daily learning objectives on the course schedule for the students' benefit. This alerts students of daily expectations and learning objectives.
3. **Develop or Identify Teaching Videos.** Videos are great teaching tools because they demonstrate procedures/steps of construction to assist in mastery learning (Cavanagh and Peté, 2017). Assigned video(s) for review prior to class as an overview or preview of what they will learn and do during the next class period. Videos can be reviewed multiple times by students as needed. If the instructor plans to develop his/her own videos, it is an advantage because they can be customized for students' learning goals. With enough self-developed videos, a YouTube channel can be created for the class and made available for anyone to review, if desired. Many currently available apparel construction YouTube videos are great resources. Additionally, craft-related organizations such as Good House Keeping and Made to Sew offer assess to free video tutorials.
4. **Identify or Develop Related Learning Resources.** Identify related and supportive videos, website links, and images. Teachers may choose to assign the included resources for review as supplemental information or have students review the resources and then complete an assignment that will be graded.
5. **Organize the Course Site.** If using a required learning management system (LMS) or class blog, it is important to have it organized. Develop lesson folders for each daily goal or topic. Conveniently place all related resources students will need in the folder, such as videos, website links, images, handouts, learning activities, quizzes, and related homework assignments. Placing all learning resources in one folder minimizes confusion. The title of the folder should correspond with the topic or learning goal of the day. For example, if the learning goal is "Understanding Fabric" then the lesson folder should be titled "Understanding Fabric."
6. **Assign Daily Homework.** Create assignments based on the daily topic/technique to be completed prior to weekly class meetings. This will make

students more responsible for their own learning, encourage class preparation and reduce anxiety. Allowing the LMS to grade homework assignments provide immediate feedback to students regarding comprehension of material. It also alleviates manual grading by the instructor.

7. **Use Class Time for Apparel Construction.** The regular teaching and/or demonstrating the technique at the beginning of class can be reduced to a 10-minute review and/or demonstration. Students can use most of the class to construct allowing more time for skill development. The instructor can address specific student questions and/or needs.

Assessment

This method is an in-class time saver for apparel construction instructors, appeals to millennials because it incorporates technology and allows for more active learning.

Outcomes observed:

- Students repeatedly viewed assigned technique videos, pausing and/or rewinding when necessary.
- Homework assignments based on specific readings and/or video(s) were completed and graded by Blackboard BEFORE class. Students desiring high homework scores read and thought critically about the content for comprehension. Students instantly become responsible for their own learning. Video resources bridged reading and application.
- Students acquired enough knowledge from completed homework and increased confidence in assessing and resolving construction issues more independently.
- Online access to homework assignments and learning resources allowed students to keep up with in-class activity, even when absent.

In conclusion, the flipped classroom has been found to engage students, improve the learning experience, and focus on skill development. The instructor must be organized, embrace technology and willing to invest the initial time to develop the course. Construction students will exhibit greater confidence and abilities needed for apparel construction success.

Literature Cited

Cavanagh, M. and M. Peté. 2017. Fashion students choose how to learn by constructing videos of pattern making. British Journal of Educational Technology 48(6): 1502-1511.

Submitted by:
Devona L. Dixon
North Carolina A&T State University

Case Studies: A Teaching Strategy for Promoting Critical Thinking in the 21st Century Agriculture Student

Introduction

Recent discussions in the agricultural sciences are focusing on how to best prepare students to become critical thinkers. According to Ricketts, Lewis and Faulkner (2018), gaining an understanding of critical thinking skills, and developing those skills themselves, is essential for educators if they are to better prepare their students to think critically.

Critical thinking is purposeful thinking in which individuals systematically impose criteria and intellectual standards upon their own thoughts (Paul, 1995). Critical thinkers are “outcome driven,” open to new ideas, flexible, willing to change, innovative, creative, assertive, persistent, energetic, risk taking, intuitive thinkers who can analyze a situation and get things done (Popil, 2013).

Teachers of agriculture are in a perfect position to increase students’ critical thinking skills using relevant, integrative lessons. But, while there are numerous opportunities in agriculture to teach critical thinking, teachers are not necessarily developing students who are critical thinkers (Pithers, 2000). One reason may be the lack of knowledge of best practices in developing lessons and activities for students. Curricula promoting higher-order thinking must employ appropriate teaching strategies to develop critical thinking and measure its effectiveness (Chikthimmah et al., 2009).

Settle and Shaw (2018) suggested that agriculture teachers may find including critical thinking activities within their classroom challenging or time-consuming. There are several teaching strategies that are best practices for engaging students but few they are best for both formal and non-formal settings. One of these teaching strategies is Case Study. Incorporating case studies into one’s class discussions provides active and engaged learning while promoting higher-order thinking among students.

How to Use the Case Study to Improve Critical Thinking

Case studies can be applied to a wide range of disciplines and topics. Teachers should begin by first introducing the topic and then the problem or issue to solve to the students and then have students:

1. Provide what they know about the problem or issue being introduced;
2. Describe in detail discuss the problem or issue;
3. Outline the steps to solve the problem or issue;
4. Assess the steps to solve the problem or issue;
5. Discuss the possible pros and cons to solving the problem or issue; and
6. Make concluding remarks on what was found when solving the problem or issue.

For agricultural education, there are cases in need of investigation in every context. It's as simple as finding an authentic problem and describing that problem in as much detail as possible, usually in a written format (but a video explanation could work, too.) Students simply take all the information given to them and work through the above steps.

Table 1. Strategies for Using Case Studies in Various Agricultural Disciplines

Discipline	Case Study Problem or Issue
Agricultural Education	Should lesson plans be developed differently for students with special needs?
Food Safety and Nutrition	Why it is important to track contaminants before they enter the food chain?
Agricultural Engineering	GMOs healthy or not?
Agribusiness/Agricultural Economics	Are Marketing Plans really useful?
Animal Sciences	Is there a such thing as Ethical euthanasia? How best to practice Animal Handling/Safety
Landscape and Horticulture	Are Rain Gardens cost effective?

Specific cases related to agricultural and environmental problems can help students investigate the context of the course of materials (Handayana, 2011). Examples of case study topics include agroforestry, biodiversity, cover crops, genetically modified organisms (GMOs), deforestation, organic farming, soil quality and urban farming.

For food and nutrition, it's also quite simple. Just think about how doctors are trained in med school. Students are usually presented with someone who is sick, and their job is to determine what is wrong with the case study in question by working through the previous steps.

In agricultural mechanics, safety is of great concern in the laboratory. A case study lesson could focus on how to address a potential safety violation. A picture could be taken of those violations and shared with class members, who could then rectify the safety issues. If the hazardous situation has the potential to be an immediate danger to the operator or others, then the picture will be skipped, and proper safety procedures will be followed.

Conclusion

Critical thinking is a rich concept that has been developing for many years (Parker, 2010). As educators develop lessons, it is important to remember: 1-Critical thinking is never universal in any individual (Parker), or discipline; and 2-Employers of college graduates in agriculture, natural resources, and related careers increasingly search for, and vet, applicants who are critical thinkers and problem solvers (i.e. Crawford et al., 2011). Case-based learning provides opportunities for students to more actively engage in the subject matter, especially in agricultural sciences (Simmons et al., 2005).

Continued evaluation of case studies should be conducted due to students' diverse learning styles (Handayani, 2011). The disadvantages of case studies include: embedded author biases, narrow focus on a dilemma facing a single person or group, and limitations in scope (Grupe and Jay, 2000). Nevertheless, using case studies is purposeful, as it allows students to address real- life situations that may not be presented by other teaching strategies.

Literature Cited

Chikthimmah, N., J. Ewing and R. Radhakrishna. 2009. Enhancing higher-order learning and critical thinking: A strategy for large undergraduate classes. NACTA Journal. Sept 2009.

Crawford, P., S. Lang, W. Fink, R. Dalton, R. and L. Fielitz .2011. Comparative analysis of soft skills: What is important for new graduates? Washington, DC: Association of Public and Land-grant Universities.

Grupe, F.H. and J.K. Jay. 2000. Incremental cases. College Teaching 48 (4): 123–128.

Handayani, L. 2011. Combining study case and learning group approaches to teaching agricultural environmental management systems, NACTA Journal, Sept 2011.

Parker, R.2010. What is critical thinking? NACTA Journal, Dec 2010.

Paul, R.1995. How to prepare students for a rapidly changing World. Foundation for Critical Thinking, Santa Rosa, CA.

Pithers, R.T. and R. Soden. 2000. Critical thinking in education: A review. Educational Research 42(3): 237-249.

Popil, I. 2013. Promotion of critical thinking by using case studies as teaching method. Nurse Education Today 31: 204-207.

Ricketts, J., C. Lewis and P. Faulkner. 2018. The evaluation of critical thinking dispositions in high school agriculture teachers. http://jsaer.org/pdf/Vol67/2007_008_final%20print.pdf. Journal of Southern Agriculture Education Research, 67.

Settle, Q. and E. Shaw. 2018. Integrating creative thinking, critical thinking, and team-building activities into lessons. https://www.nactateachers.org/images/TeachingTips/002_Integrating_Creative_Thinking_Critical_Thinking_and_Team-Building_Activities_Into_Lessons.pdf. NACTA Journal.

Simmons, S., A. Dincesen, H. Murray, T. Dunrud, B. Buhr and C. Angle. 2005. "Anybody's dream": A decision case of marketing alternative crops. Journal of Natural Resources and Life Sciences Education 34: 29-35.

Submitted by:
Paula E. Faulkner and Meeshay Williams-Wheeler
North Carolina Agricultural and Technical State University

John Ricketts
Tennessee State University

Message from the 2018-2019 NACTA President

NACTA is a professional organization for post-secondary educators of agricultural, environmental, natural, and life sciences; and so much more. It is a social group of like-minded professionals many of whom have made lasting friendships as well as fruitful academic collaborations. The organization supports professional development and provides a respected publication outlet for research on teaching and learning. NACTA also supports many grants, awards, and honors for the membership to recognize professional excellence and contributions to the betterment of the NACTA organization as a whole.

My involvement with NACTA began when I started my faculty career as a newly minted PhD. I was encouraged to participate in the annual conference by my new colleagues, and I haven't looked back in the ensuing 20+ years. Over these years, I have found NACTA to be extremely beneficial professionally, and one of the most enjoyable organizations to be involved with personally. I believe the network of agriculture educators created by NACTA provides a wonderful space for graduate students, new, mid-career, and senior faculty to all engage in constructive conversations about teaching and learning.

As the 2018-19 President, I look forward to serving the NACTA membership and building on the positive direction I believe the organization is headed. As I mentioned in my installation remarks at the annual conference in June, the NACTA leadership team worked during the last academic year to identify short- and longer-term issues our organization needs to address. I look forward to continuing this work and to gathering additional input and feedback from our members. If you have ideas or suggestions that can make our organization stronger, please contact me.

We, as a collective of agricultural, environmental, natural, and life sciences educators have the privilege and responsibility to teach the next generation of professionals who will continue to advance knowledge and identify solutions in many of the global challenges faced by society; issues like human health, renewable energy, and of course feeding the world.

As your president for the next year, I look forward to collaborating with you to share our vision for addressing these global challenges and to celebrate the incredible work you do on your campuses.

I hope to see you at the 65th annual conference June 18-21, 2019 at the College of Southern Idaho!

Ann Marie VanDerZanden, President
North American Colleges and Teachers of Agriculture

NACTA 2018 Conference Reports

Secretary's Report - June 2018

General

- Membership records are maintained in Microsoft Excel and QuickBooks. We continue to implement QuickBooks for membership record-keeping. Individuals and Institutions have received invoices for their yearly membership dues since fall 2017. Karen Earwood sends out invoices and helps in maintaining these records.
- Records include contact information (no phone numbers), payment type, membership code/ region, unique membership number (no credit card numbers are kept on file).
- We have used MailChimp for e-Newsletters – information and reminders; continually updated.
- Continual update of online Journal access if membership is not paid.
- Position announcements received and posted throughout the year to the NACTA website; charges billed if they are not an Institutional member of NACTA.
- Authors of NACTA Journal manuscripts are billed if they are not NACTA members at the time of their manuscript publication.
- With the NACTA President, agendas for the fall and June executive meetings are prepared; minutes taken at these meetings, then prepared and sent to all executive committee.
- With the NACTA President, the yearly Conference Business meeting agenda is prepared; discussed at monthly online meetings and sent out to the executive committee.
- With the NACTA President, agenda for the monthly online meetings is prepared and sent out to the executive committee; minutes taken for monthly online meetings then prepared and sent out to all executive committee.
- September and October, preparations made for fall executive committee meeting – hotel with meeting room and appropriate technology available, lunch provided, work with hotel to obtain reduced room rate for those attending the executive committee meeting.
- Communication with NACTA President, President-elect, and executive committee on a host site visit. The visit occurs the day before the Fall executive meeting.
- Oversee preparation of E-newsletters with the NACTA Editor and send out approximately once a month; oversee MailChimp updates for the e-newsletter.
- Assist with current conference registration/communications as needed; other conference preparations include ordering of slide-in certificate plaques for awardees, preparing certificates for Journal Awards and Graduate student poster contests, ordering engraved plaques for conference awards, writing checks for conference awardees, preparation of first-time attendee materials for conference, and making sure all conference materials reach the conference.
- Continual preparation of financial records for twice yearly reviewing.
- Work with Foundation Director for accounting of finances

Memberships – New and Renewals

- Emails are sent to individuals in the fall; monthly reminders are sent through QuickBooks after that time.
- Payment can be taken by check, credit card (VISA or MasterCard) by PayPal (online) or QuickBooks-Intuit (GoPayment), fax or mail, or by calling the secretary.
- 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 and Membership Director. The Membership Director and the Regional directors also send an email letter of welcome.
- New Life members receive a "Letter of Welcome" and their name is sent to the Membership director, Regional Director, NACTA President, and President-Elect.
- *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 – 117
- Individuals – 704 (approximately – includes Institutional Active, Active, Graduate Students, Life, and Emeritus)
- Life Members – 173 (includes 17 new – either new members or members that changed to Life member status)
- Libraries – 39 (includes Canadian/foreign)
- 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 January, February, March and as needed.

- New institutions: Ivy Tech Community College, Lafayette, IN (Judging contest); Ozarks Technical Community College, Springfield, MO; Brigham Young University, Idaho; Eastern Wyoming College, Torrington, WY (Judging contest)
- Note: All colleges/universities participating in the NACTA Judging Contest paid their Institutional memberships for 2018.
- Institutions not renewed for 2018: University of Idaho, Louisiana State University, University of Arizona, Berea College, KY, Stephen F Austin State University
- Those institutions which pay for individual one-year NACTA memberships: Purdue University, University of Illinois, University of Florida, Penn State University.
- Note: If you are aware of changes in leadership for a college or university, please share that information to the NACTA Secretary

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

- Canadian members – 7 / Institutions – 5
- Foreign members – 2 (Iran and University of the West Indies, Trinidad/Tobago)
- Libraries – 3 Canadian (University of Guelph, Ontario; University of Alberta; Dalhousie University, Nova Scotia) / 3 Foreign – Massey University (New Zealand), Chinese Academy of Agriculture (through EBSCO), Zayed University (through EBSCO)

Teaching Award of Merit / Graduate Student Certificates

- Total of 62 certificates were awarded this year - 2018 (41 faculty/21 graduates). In 2017, 64 certificates were awarded and 89 were awarded in 2016.
- Institutions are reminded of these certificates when they are billed for renewal, and when they renew. (We are willing to 'overnight' a certificate if needed and have done so).
- Certificates are a mix of NACTA member and non-member.
- Continued importance and awareness of this award to institutions is needed.

Online Voting

- NACTA officer voting names and information is prepared for Survey Monkey
- At the end of voting, the NACTA Membership Director notifies all those who participated and the results
- Approximately 146 votes were cast for the officer elections through Survey Monkey.

Action Item

- Retaining memberships and encouraging new memberships is an ongoing theme.

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

Submitted by:
Marilyn B Parker
NACTA Secretary
June 2018

Treasurer's Interim Report - June 2018

Membership dues

- Major factor in keeping NACTA financially viable
- Critical to maintain current membership levels or increase
- Three-year membership payment option is working well
- Those paying the life membership through the $200 per year plan is working well
- Even though we had about 150 new memberships this year, approximate 240 people did not renew their memberships for 2018 after paying a 2017 membership. This is a loss of membership income of approximately $15,000.
- Appreciation is given to Karen Earwood-Kenny in our office for helping to maintain the memberships and renewals through QuickBooks

Profit and loss statement

- Created by QuickBooks
- The accounting firm of Deagle, Ames & Co 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 account, maintained at DL Evans Bank in Rupert, Idaho
- Detailed Profit & Loss statement is available for any NACTA member
- Beginning Assets: $100,094 / Ending Assets: $111,714
- Currently in PayPal (5-31-18) $8,907 which has not been transferred to the NACTA checking account

Income sources (additional)

- Royalties from ITHAKA (JSTOR), ProQuest, Gale (Cengage), and EBSCO - $3,464.16
- Manuscripts publication fees – 4 at $100 each and 3 at $200 each – Total of $1,000
- Position announcements – 2 at $100 each - $200

Donations

- CHS Grant monies were received in August 2017 - $100,592
- Donation of $4,300 received and deposited in December 2017 from Purdue University

Expenses

- Partially covered by NACTA membership dues - Journal preparation, membership maintenance

(individuals, institutions, manuscript publication fees, position announcements and libraries), Website upkeep
- Covered by CHS Foundation Grant – Time spent on different categories of work: Banquet Awards booklet, Abstract book, hosting event for new NACTA members at conference, membership promotion 2-year/4-year schools, Conference postings, Judging conference support, Social media (Facebook, twitter and conference postings)

Bank Balance
- Bank statement for the checking account ending May 31, 2018 is $111,714. (Table of Disbursements below – Profit and Loss by Class and Balance Sheet by Class)

Submitted by:
Marilyn B Parker
NACTA Treasurer
June 2018

2:29 PM
06/09/18
Accrual Basis

NACTA
Balance Sheet by Class
As of May 31, 2018

	CHS Grant	Unclassified	TOTAL
ASSETS			
Current Assets			
Checking/Savings			
Checking	63,821.28	46,718.46	110,539.74
PayPal	0.00	9,019.24	9,019.24
Total Checking/Savings	63,821.28	55,737.70	119,558.98
Accounts Receivable			
Accounts Receivable	0.00	9,975.00	9,975.00
Total Accounts Receivable	0.00	9,975.00	9,975.00
Other Current Assets			
Undeposited Funds	0.00	375.00	375.00
Total Other Current Assets	0.00	375.00	375.00
Total Current Assets	63,821.28	66,087.70	129,908.98
Other Assets			
Prepaid Conference Expenses			
Conference Promotion	0.00	926.89	926.89
Total Prepaid Conference Expenses	0.00	926.89	926.89
Total Other Assets	0.00	926.89	926.89
TOTAL ASSETS	63,821.28	67,014.59	130,835.87
LIABILITIES & EQUITY			
Liabilities			
Current Liabilities			
Accounts Payable			
Accounts Payable	11,198.39	10,859.11	22,057.50
Total Accounts Payable	11,198.39	10,859.11	22,057.50
Total Current Liabilities	11,198.39	10,859.11	22,057.50
Total Liabilities	11,198.39	10,859.11	22,057.50
Equity			
Retained Earnings	4,445.00	28,801.77	33,246.77
Net Income	48,177.89	27,353.71	75,531.60
Total Equity	52,622.89	56,155.48	108,778.37
TOTAL LIABILITIES & EQUITY	63,821.28	67,014.59	130,835.87

NACTA Business Meeting Minutes

Friday June 15, 2018, 12:30 pm
Iowa State University
Scheman Building, Rm 220

The Business meeting was held at the end of the Friday noon luncheon. There were approximately 240 in attendance.

President Mark Russell called the meeting to order. First time NACTA Conference attendees were recognized. The NACTA Executive Committee members were introduced. Thank You to Dr. Ann Marie VanDerZanden and her planning committee and the ISU Conference Planning and Management Center for hosting the conference.

Reports presented:
Secretary/Treasurer – Marilyn Parker
Secretary/Treasurer Reports Approved
- Memberships maintained in QuickBooks and Excel
- New members welcomed by secretary, regional director and membership director; three invoices received during year for renewal of dues
- 127 Institutions; all schools participating in the NACTA Judging Contest this year paid their Institutional membership; 4 new institutions; 5 institutions did not renew their memberships
- 39 libraries
- Approximately 704 members (includes 17 new Life members this year)
- 150 new memberships for 2018
- Approximately 200+ people did not renew their membership for 2018 meaning a loss of $15,000
- 62 Teaching/Graduate Student Certificates awarded on campuses (members/non-members of NACTA)
- Income: Royalties, ProQuest, EBSCO, manuscript publications; position announcements and manuscript publication fees totaling $4,664
- 146 votes cast for the NACTA Officer voting for the 2018-2019 officers through SurveyMonkey; last year 176 votes cast
- Donations – CHS Foundation grant of $100,592 received August 2017 reflects the last year of a three-year grant; donation of $4,300 from the Purdue University 2017 Conference and personal donations of $1100 (the Purdue and personal donations have been moved to the NACTA Foundation account)
- Total amount in NACTA DL Evans checking account as of May 31, 2018 is $111,714
- Appreciation to Karen Earwood-Kenny and Miriah Pace for help with the various aspects of NACTA work on a daily basis.

Journal Editor/ Publications Report – Rick Parker
- History of Journal submissions from 2006 to 2017, percent accepted/rejected and their changes over the years
- As of June 2018, 96 manuscripts were submitted and 62 accepted

- Editorial board for 2017-2018 consisted of 50 reviewers from 32 different institutions; these are kept current
- 37 Teaching Tips/Notes submitted (compared to 22 in 2016) but 22 were submitted by a group at Iowa State University
- 973 annual hard copies of 2017 NACTA Journal sent out in January 2018; Journals can be purchased through Lulu online
- Created guidelines of validity and reliability for authors engaging in social science research
- Produced a spiral-bound, 155 page, "Editor's Choice Teaching Tips" book featuring 64 Teaching Tips from 2011 to 2018; these were given to first time attendees at the 2018 conference
- There were 260 conference abstracts; Volume 62, Supplement 1 compiled and printed through support of CHS Foundation funds for conference participants; electronic copy available through TagMyDoc and the NACTA website
- 10 Workshop proposals submitted and 6 were selected
- Authors submit PowerPoint presentations and jpgs of posters to abstract submission site; these are posted to the NACTA website after the conference
- Websites maintained by NACTA are the Journal and abstract submission sites, awards submission; Facebook, Twitter, LinkedIn, Flickr, Book Reviews, E-Newsletter, and NACTA Store
- QR codes used for student poster contest voting; Sixth Annual Graduate Student poster contest this year
- Created Banquet Awards Program booklet book through funds from CHS Foundation
- Electronic issues of the Journal are provided to ProQuest, the Gale (Cengage) Group and JSTOR; NACTA receives royalties from these groups
- DTA information was posted to the NACTA Website through CHS funds; information consisted of nine different pages of information (DTA Homepage, About Us, Meet the Team, Information, Regions, 14 forms (which can be completed online and emailed to the Advisor), National Convention, The Achiever newsletter, Contact Us
- NACTA Judging Conference website updated and more information for host institutions and coaches added through CHS Foundation funds
- Google Analytics numbers from May 2017 to June 2018 showed 13,161 users in 21,038 sessions; 68,924-page views, new visitors 83% with 17% returning visitors; United States was the largest user with 9,409 and included, in order of use Philippines, Canada, India, United Kingdom, Australia, Pakistan, Nigeria, and Tanzania (119 users)
- Suggestions: impact statement for Journal; Kindle/iPad publishing of Journal; special issue of Globalization; increase fee to libraries for NACTA Journal; ways to connect with 2-year schools; other uses/outlets for NACTA Journal-produced publications and website media
- Appreciation to Karen Earwood-Kenny and Miriah Pace for help with the various aspects of NACTA work on a daily basis

5:27 PM
06/09/18
Accrual Basis

NACTA
Profit & Loss by Class
October 2017 through May 2018

	CHS Grant	Unclassified	TOTAL
Ordinary Income/Expense			
Income			
Conference Income	0.00	0.00	0.00
Grants/Contributions	100,592.00	500.00	101,092.00
Manuscript Page Charge	0.00	600.00	600.00
Membership Dues	0.00	75,075.00	75,075.00
Position Announcement	0.00	185.00	185.00
Royalties Income	0.00	3,464.16	3,464.16
Total Income	100,592.00	79,824.16	180,416.16
Gross Profit	100,592.00	79,824.16	180,416.16
Expense			
Advertisement	200.00	0.00	200.00
Awards	0.00	100.00	100.00
Bank Charges	0.00	0.00	0.00
Computer & Internet Expense	993.12	494.86	1,487.98
Conference Expense	2,491.63	3,857.05	6,348.68
Credit Card Fee	0.00	1,740.20	1,740.20
Executive Director	18,060.00	0.00	18,060.00
Fall Exec Mtg	0.00	385.03	385.03
Honorariums	0.00	12,148.00	12,148.00
Insurance	0.00	750.00	750.00
Journal-Misc Expense	0.00	2,191.00	2,191.00
Journal Printing	0.00	9,000.00	9,000.00
Judging Expenses	5,000.00	0.00	5,000.00
Misc Expense	0.00	177.38	177.38
Office Expenses	0.00	910.39	910.39
Phone Charges	0.00	336.60	336.60
Postage	0.00	577.40	577.40
Professional Fees	0.00	1,010.00	1,010.00
Secretarial	25,669.36	13,180.58	38,849.94
Supplies	0.00	97.88	97.88
Travel	0.00	127.08	127.08
Web Site Expense	0.00	5,387.00	5,387.00
Total Expense	52,414.11	52,470.45	104,884.56
Net Ordinary Income	48,177.89	27,353.71	75,531.60
Net Income	**48,177.89**	**27,353.71**	**75,531.60**

Membership Chairman – Tracy Dougher

- Numbers of NACTA memberships given – individuals, institutions, new Life members
- A Campus Ambassador is needed for Iowa State University as well as many other universities. Please see Dr Dougher if interested
- Survey information for membership concerning different aspects of NACTA will be distributed later

Liaison Reports

- Kevin Donnelly (for Lyle Westrom, NACTA Judging Conference Director)
  - When the audience was asked how many were aware of the NACTA Judging Conference, most of the attendees indicated they were
  - Judging Conference has its own officers and annual meeting
  - Mike Roeber, Judging Conference President, Northeast Community College, NE, gave details of the last the Judging Conference hosted by Northeast at Norfolk, NE – 550 people at the closing banquet; Iowa State (4-year) and Black Hawk College (2-year) were sweepstakes winners

- 2019 host will be Murray State University, Murray, KY
- APLU/APS/NARRU – Tracy Hoover
  - A brief overview of APLU was given (Association of Public and Land-grant Universities)
  - Tracy is a member of APS (Academic Program Section) which represents membership of Associate Deans of Academic Programs in Land-grant and (NARRU) Non-land grant Agriculture and Renewable Resources Universities
  - Dr Todd Winters, Dean, University of Tennessee, Martin, is our NACTA NARRU liaison and also an APS member
  - Wendy Fink, director of Food, Agriculture, and Natural Resources and Executive Director for the BAA Academic Programs Section regularly attends our NACTA conferences
  - These organizations support several awards and programs to support teaching and learning. Many NACTA members have been recipients of these awards. Information on these awards can be found on the APLU/APS website http://www.aplu.org/members/commissions/food-environment-and-renewable-resources/board-on-agriculture-assembly/academic-programs-section/index.html

Election Results

- President-elect – Foy Mills, Lubbock Christian University, TX
- NACTA Judging Conference Director-Elect – Drew Cotton, Black Hawk College, Illinois
- Central Regional Director-elect – Cheryl Wachenheim, North Dakota State University
- Canadian Regional Director-elect – Heather Bruce, University of Alberta

New Committee Chairs

- Educational Issues & Teaching Improvement (EITI) – Brian Pearson (2nd Term)
- International – Kelly Newlon (1st Term)
- Membership and Public Relations – Tracy Dougher (1st term)
- Journal Awards – TBA

Future Conference updates

- NACTA is open for future conference hosting bids beyond 2021; future conferences have been confirmed and will be at the following locations:
  - 2019 – College of Southern Idaho, Twin Falls
  - 2020 – New Mexico State University, Las Cruces
  - 2021 – The Ohio State University, ATI, Wooster; welcome from Dr Thom Janini; Membership voted to approve this location for the 2021 NACTA Conference
- NACTA Judging Conference
  - 2019 – Murray State University, KY
  - 2020 – Fort Hays State University, KS
  - 2021 – Hutchinson Community College, KS

NACTA Business Meeting recessed for Foundation Meeting

Foundation Report – Jeff Hattey

- Activities – Advisory Council was constituted with the following members: Dean Winward, Southern Utah University, Holli Leggette-Archer, Texas A&M University, Mark Russell, Purdue University, Tracy Dougher, Montana State University, Tracy Hoover, Penn State University
  - Reviewed history of NACTAF income and expenses
  - Worked on visioning initiative
- Viewed NACTA donation page on the website
- Viewed the financial picture of the Foundation. What are the total assets of the NACTA Foundation?
- Introduced the Rick and Marilyn Parker Engagement Award and gave details
  - $75,000 is goal; three $1,000 annual awards for those recognized as early career faculty who have demonstrated commitment to NACTA and the Scholarship of Teaching and Learning; fund raising ends June 2019
  - Recommended to approve by Foundation Advisory board; **voted to approve** award

NACTA Foundation meeting adjourned

NACTA Business Meeting reconvened

- Thank you to the NACTA committee chairs for conducting your meetings today
- Dr Frank Robinson will be the Assistant Editor for the NACTA Journal
- Information about the La Molina Conference, October 17-19, 2018, in Peru, will be posted on the NACTA website

Presentation from College of Southern Idaho, Twin Falls, Idaho – Matt Quesnell and Chance Munns

- Interesting facts presented by Matt Quesnell about Southern Idaho and the College of Southern Idaho
- Welcome to the NACTA Conference at the College of Southern Idaho from Chance Munns
- Video invitation/presentation for the College of Southern Idaho Conference in 2018

NACTA Business meeting concluded at 2:00 pm

Recorded by:
Marilyn B Parker
NACTA Secretary/Treasurer

NACTA
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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 Awards, NACTA Teaching Scholar Awards, John Deere Award, Murray Brown NACTA Leadership Awards, Teaching Award of Excellence, Distinguished Educator, Graduate Student Teacher Awards, Excellence in Teaching and Learning with Technology Awards and NACTA Judging and Student Service Award.

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 (if your institution is NOT a member)
- ❑ Graduate Student $25/year
- ❑ Emeritus $25/year
- ❑ Lifetime $750 if made in one payment (or $800 if made in four consecutive annual payments of $200)
- ❑ Institutions $150 for 4-year schools and 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 digit security code:_____

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 2018-2019*

Membership & Public Relations
Tracy Dougher
Montana State University, Bozeman
tracyaod@montana.edu

Journal Awards

Educational Issues & Teaching Improvement
Brian Pearson
University of Florida, Gainesville
bpearson@ufl.edu

NACTA Teacher Recognition Committee
Wendy Warner, Chair, North Carolina State University
Shannon Arnold, Montana State University
Jane Bachelor, University of Florida
Kirby Barrick, University of Florida
Kevin Donnelly, Kansas State University
Nick Fuhrman, University of Georgia
Ronald J. Hanson, University of Nebraska-Lincoln
Donald M. Johnson, University of Arkansas
David Jones, North Carolina State University
Lurline E. Marsh, University of Maryland
Greg Miller, Iowa State University
Foy Mills, Lubbock Christian University
Jeannette Moore, North Carolina State University
Joy Morgan, North Carolina State University
Milton Newberry, North Carolina State University
Ray Smith, Abraham Baldwin Ag College, GA
Dan Stein, Oklahoma State University
Gary Steinhardt, Purdue University
Shweta Trivedi, North Carolina State University
Bonnie Walters, University of Wisconsin, River Falls
Dean Winward, Southern Utah University

Liaisons
Delta Tau Alpha
Elizabeth Walker, Missouri State University, Springfield

APLU
Tracy Hoover, Penn State University, State College, PA

CFAVM & CADAP

CAPICU

International Committee
Kelly Newlon
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Nominating
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NACTA Foundation Director
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*** If you are interested in serving on one of the committees contact the Chair.**

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