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Abstract

The National Research Council challenged colleges of agriculture to make changes to instructional practices for undergraduate students. Education in any context seeks to enhance student learning. One of the facets of the learning process is teacher instructional practices. The theory of planned behavior describes the ability to predict behaviors based on an understanding of beliefs. This study investigated the influence of beliefs of inclusion on the usage of teacher immediacy activities. Inclusion is defined as the control students are given over the learning process. The beliefs on inclusion for five faculty members of the College of Agricultural and Life Sciences (CALS) at the University of Florida were assessed using the Heimlich/Van Tilburg Teacher Beliefs Scale and the teaching behaviors of the instructors were documented using observational techniques. Results indicated that 62% (n = 21) of the behaviors were utilized more frequently by highly inclusive instructors. Apparently, beliefs about the inclusivity do influence the frequency of teacher immediacy behaviors. Additional research should seek to have a more diverse population of teacher beliefs represented. For practical application, development of a teacher diagnostic tool should occur which could help predict or describe teacher's classroom practices and needs. Such a tool could help those who deliver professional development to college faculty deliver more appropriate programs.

Introduction

In 2009, the National Research Council (NRC) challenged colleges of agriculture and related sciences to make changes to curricula and instructional practices. The NRC recommended these changes be made as a result of the need for college graduates to be able to solve complex global problems (NRC, 2009). The NRC also noted that an update to methods of instruction and curricula should occur, although they acknowledged that there are currently numerous examples of professors who have already embraced new pedagogies and are working to prepared society-ready graduates.

With that in mind, research has indicated students are more engaged in the learning processes when they are involved with the faculty in the collective process of education (Umbach and Wawrzynski, 2005). Dunkin and Biddle (1974) laid the descriptive foundation for the formal teaching process. Their model describes

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the complexities of the formal teaching/process, which involves the interactions between the teacher, learners, content and the learning environment (Dunkin and Biddle, 1974). One component of the process, which should be elucidated, is an understanding of the internal beliefs a teacher holds and the corresponding teacher behaviors from such beliefs.

Theoretical Frame

According to Ajzen's (1991) Theory of Planned Behavior, a person's beliefs influence their intentions for behavior outcomes, which in turn directly influence their observable behaviors. When correlated to the goal of teaching, the classroom behaviors of teachers ultimately affect student achievement (Fang, 1996). Clark and Peterson (1986) showed a relation of Ajzen's theory to teaching; describing the interaction of two domains, (a) teachers' thought processes and (b) teachers' actions and their observable affects, as the opportune interaction of study to enhance or inhibit student performance.

The Theory of Planned behavior served as the theoretical frame for this study (Ajzen, 1991). The major constructs of attitudes, subjective norms, perceived control, are operationalized as internal beliefs, or teacher beliefs for this study (Ajzen, 1991). For the purposes of this study, teacher beliefs were operationalized as their score on the teacher belief scale (Heimlich, 1990) and teacher behavior was operationalized as the frequency of teacher immediacy behaviors (Christophel, 1990) exhibited in the classroom.

Teacher Beliefs

Heimlich (1990) delimited the two key dimensions of a teacher's beliefs, related to their thoughts and actions, as sensitivity and inclusion. Sensitivity relates to the understanding of the group (learners) needs, while inclusion refers to the amount of control students have over their learning within an instructor's classroom. Heimlich asserted these two key dimensions stem from the belief that a teacher's success relates to their ability to be sensitive to the cultural interactions within the learning environment; as well as, the teacher's ability to relinquish control. He also asserted that the measurement and subsequent intersection of these two dimensions will indicate a preferential teaching style (Heimlich, 1990).

As described, Heimlich (1990) stated that the teacher outcomes or activities associated with each dimension change the focus from teacher to learner (inclusion) and from content to process (sensitivity) as one increases on either axis. The theorized value of the dimensions is that they serve as the predictor for how an educator will perform within the educational process (Heimlich, 1990). Clark and Peterson (1986) further validated these dimensional beliefs as predictors by stating that teacher beliefs are a vector for perception, process and action related to classroom activities.

Heimlich (1990) assessed adult educators in Ohio and found that 95% of those educators were highly sensitive and 95% were highly inclusive, using the conventions previously mentioned. In 1992, Cano et al. applied the conventions to preservice teachers in agricultural education and found that 56% of those preservice teachers were both highly sensitive and highly inclusive and only 20% were only highly inclusive or highly sensitive. Whittington and Raven (1995) conducted similar research assessing teaching beliefs of student teachers and found 87% of student teachers were both highly sensitive and highly inclusive. Most recently, Giorgi and Roberts (2011a) found that 91% of excellent undergraduate professors were highly sensitive and 82% of the same population were highly inclusive.

Teacher Immediacy

Teacher immediacy has been defined as the perceived closeness between people, both physically and psychologically (Christophel, 1990). For the purposes of this study, teacher immediacy was operationalized as teacher behaviors, verbal and nonverbal, that facilitate the perceived feeling of closeness (Wilson et al., 2010). Velez (2008) suggested the value of researching teacher immediacy in agricultural education at all levels, relates to the suspected effect of teacher immediacy on student motivational processes.

The theoretical foundation of teacher immediacy was derived from the implicit communication theory and communication behaviors research of Mehrabian (1969, 1981). Mehrabian (1981) produced three dimensions, which described the various emotional responses elicited based on diverse communication stimuli.

Furthermore Andersen (1978) defined nonverbal teacher immediacy as nonverbal behaviors that reduce either the physical or the psychological distance between people. Nonverbal interactions have been attributed to upwards of 90% of the meaning of messages in the classroom, proving the extent of importance for such interactions (Andersen, 1978; Velez, 2008). Additionally Andersen found that as much as 81.6% of all teacher behaviors are nonverbal and Crump (1996) found that students preferred the nonverbal immediacy behaviors that translated into dynamic content delivery and vocal variations (Crump, 1996).

Velez (2008) stated, "*Verbal teacher immediacy refers directly to stylistic verbal expressions used by teachers to develop within students a degree of like or dislike towards the teacher*" (p. 42). Examples of stylistic expressions pertinent to teacher beliefs of inclusion are

usage of past or present verb tense, probability (will vs. may), inclusivity (we vs. I), ownership (my vs. our class) and adjective variations (that vs. this person; Gorham 1988). Research has indicated that there is an association between verbal immediacy behaviors and an increase in cognitive, affective and behavioral learning (Christophel, 1990; Gorham, 1988; Gorham and Christophel, 1990; Plax et al., 1987; Rodriguez et al., 1996).

What is more, Wilson et al. (2010) investigated the relationship between immediacy behaviors and rapport within the classroom. Wilson et al. found that immediacy correlated to the level of professor/student rapport. Wilson et al. (2010) also investigated the relationship between teacher immediacy and the outcome variables of course grades and amount learned and discovered teacher immediacy predicted 23% of the variability of amount learned as self-reported by students and 6% of the variance for student self-reported grades was explained by immediacy. In relation to student motivational processes, literature has suggested a positive relationship between nonverbal immediacy and motivation (Chrsitophel, 1990; Christophel and Gorham, 1995; Kalish, 2009; Wilson and Locker Jr., 2008).

In addition, Mehrabian (1981) indicated the relationship between emotional responses and liking. Accordingly, "the more arousing a pleasurable entity is, the more it is liked" (Mehrabian, 1981, p. 11). Teachers who exhibit high levels of nonverbal immediacy should possess higher levels of affect and liking from their students (Andersen, 1978). Previously, Giorgi and Roberts (2011a) demonstrated student desire for more control over the educational process, the definition of inclusion. If the concepts of student desire for inclusion and liking are applied to a classroom setting, teachers who exhibit more behaviors are seen as more inclusive towards students and the teacher will be more liked and vice versa.

Purpose and Research Questions

The purpose of this study was to explore the relationship between teacher beliefs and teacher behaviors. The study sought to answer the following question: How do a teacher's beliefs influence their behaviors in the classroom?

Methodology

This study used a case-study approach to examine the potential linkage between teacher beliefs and classroom teaching immediacy behaviors (Gall et al., 2003). Five professors from the College of Agricultural and Life Sciences (CALS) at the University of Florida (UF) were identified as excellent instructors. The five professors were selected for this study due to their achievements as instructors based on a multifaceted recognition process using multiple measures of effectiveness, such as the UF's CALS teaching award selection process and the NACTA Teacher Fellow's award system. Four of the five faculty members have received awards at or above the college level and the final faculty member is widely known for their inventive teaching style. Additionally, only five instructors were chosen due to the time requirements of the coding process and data analysis. A description of each instructor is provided below.

Instructor 1

Instructor 1 is a white male in his early 60's. He holds the rank of professor in forestry, with a specialization in fire ecology. He has worked at UF for twenty-five years. His typical teaching load consists of four undergraduate and two graduate courses per year. He is the recipient of the 2004-05 CALS Undergraduate Teaching Award and a NACTA Teacher Fellow. While working on his PhD at North Carolina State University, he served as graduate teaching assistant. He stated that participation in a variety of teaching–related workshops and his graduate teaching assistantship have aided his growth as an educator. Instructor 1's observed class was a combination graduate and upper–division undergraduate class designed for students in the major. There were approximately 14 students enrolled in the class and the classroom had fixed desks that would accommodate approximately 40 students. Instructor 1 was classified as a Provider on the teacher belief instrument; he had a low inclusion score.

Instructor 2

Instructor 2 is a white male in his late 40's. He holds the rank of associate professor in agricultural economics, with a specialization in agricultural sales. He has worked at UF for thirteen years and typically teaches four undergraduate and two graduate courses per year. He is the recipient of the 2001-02 CALS Undergraduate Teaching Award and a NACTA Teacher Fellow. While working on his PhD at Michigan State University, he served as a graduate teaching assistant. Participating in coursework, workshops, independent reading and consulting with teaching experts are all activities he considers to have improved his teaching. His observed class was an upper–division undergraduate course that had a mixture of students from inside and outside the major and there were approximately 105 students enrolled in the class. The lecture hall was equipped with fixed desks that would accommodate approximately 200 students. Instructor 2 was classified as an Enabler on the teacher belief instrument; he had a high inclusion score.

Instructor 3

Instructor 3 is an African-American female in her mid-30's and she holds the rank of assistant professor in family studies, with a specialization in family structure. She has worked at UF for six years, with a typical teaching load of six undergraduate courses per year. She was selected to receive the CALS Undergraduate Teaching Award in 2008-09. While working on her PhD at Florida State University, she served as a graduate teaching assistant. Participating in coursework, workshops, independent reading and consulting with teaching experts are all activities she considers to have improved her teaching. Her observed class was an upper–division undergraduate course with a mixture of students from inside and outside the major. There were approximately 88 students enrolled in the class. The lecture hall had fixed desks that would accommodate approximately 160 students. Instructor 3 was classified as an Enabler on the teacher belief instrument; she had a high inclusion score.

Instructor 4

Instructor 4 is a white male in his early 30's. His is an assistant professor in agricultural economics, with a specialization in agribusiness. He has worked at UF for five years, with a typical teaching load of four undergraduate and two graduate classes per year. He was awarded the CALS Undergraduate Teaching Award for 2010-11. While working on his PhD at Perdue University, he served as a graduate teaching assistant. Participating in coursework, workshops, independent reading and consulting with teaching experts are all activities he considers to have improved his teaching. His observed class was an upper–division undergraduate course for students within the major and there were approximately 43 students enrolled in the class. The lecture hall had fixed desks that would accommodate approximately 100 students. Instructor 4 was classified as a Provider on the teacher belief instrument; he had a low inclusion score.

Instructor 5

Instructor 5 is a while female in her late 40's. She holds the rank of lecturer in agronomy, with a specialization in plant production. She has worked for UF since 2008 and her typical teaching load consists of five undergraduate and two graduate courses. Instructor 5 has been through the Process Oriented Guided Inquiry Learning (POGIL, www.pogil.org) training and has implemented those practices in her classroom. This has spawned the wide recognition of her as an innovator in the classroom. She earned her PhD from Florida State University. However, she was not a graduate teaching assistant. Participation in workshops, independent reading and consultations with teaching experts are all activities she considers to have improved her teaching. Her observed course was an upper–division undergraduate class with a mixture of students from a variety of major and there were approximately 38 students enrolled in the class, which was held in a classroom with movable desks accommodating approximately 40 students. Instructor 5 was classified as an Enabler; he had a high inclusion score.

Data Collection/Instrumentation

Data were collected during the 2009-2010 academic year, in the fall and spring semesters. Each faculty provided background information related to their teaching experiences and completed the Van Tilburg/ Heimlich Teaching Belief Scale (Heimlich, 1990). The scale has two axes, which measure the dimensions of sensitivity and inclusion. The resulting scores on each axis categorize teachers as Experts (low sensitivity, low inclusion), Facilitators (low sensitivity, high inclusion), Providers (high sensitivity, low inclusion) and Enablers (high sensitivity, high inclusion). The transition from low to high, along the dimension of inclusion deals with the amount of educator control that is exerted, while transitioning from low to high along sensitivity moves from a process-driven to a learner-driven educational environment (Heimlich, 1990).

The Van Tilburg/Heimlich Teaching Belief Scale is a twenty-two item instrument. The items relate to the two bi-polar dimensions of sensitivity and inclusion (Heimlich, 1990). A score is determined for each dimension based on respondents' agreement to the various items and predetermined values for each of the statements. Heimlich (1990) defines a low score as zero to six and high as six to eleven for each axis. Numeric scores are plotted on a grid with defined quadrants in order to label the respondents' Teacher Belief Scale type.

The teaching behaviors of the instructors were documented using observational techniques. A minimum of two class sessions were identified and then video recorded by the researchers. A high–definition video camera was placed in the rear of the classroom to capture the actions of the instructor. The video recordings were converted to an appropriate format and loaded in to the Noldus Observer © software suite for analysis.

Furthermore, Christophel's (1990) Immediacy Behavior Scale was modified for use in this study. The Immediacy Behavior Scale was designed to allow students to rate their instructor on a 1 to 5 rating scale for 34 behaviors, 20 verbal and 14 nonverbal (Christophel, 1990). The instrument was modified by the researchers to allow frequencies of each behavior to be visualized with the software. Behaviors were noted each time instructors demonstrated them.

Data Analysis

A user-defined index was developed within the Noldus Observer © software to visually assess the recorded class sections. The index was as a modified version of the Immediacy Behavior Scale (Christophel, 1990).

According to Gall et al. (2003), the quality of observational data is critical when conducting observational research. Three key elements are considered to establish reliability in the data: criterion-related observer reliability, intra-observer reliability and inter-observer reliability (Gall et al, 2003). Criterion–related observer reliability is the degree that an observer's evaluations agree with a known expert (Gall et al., 2003). Intra–observer reliability is the degree that an observer is able to consistently code an observation (Gall et al., 2003). Inter–observer reliability is the extent that two raters are able to code observations in a similar way (Gall et al., 2003). To ensure criterion–related observer reliability, training of each observer occurred and then periodic comparisons with the lead researcher's ratings were conducted. A system of multiple raters, focusing on each aspect of the observation was established to ensure intra-observer and inter–observer reliability. Each researcher coded the video independently and then compared ratings for each class session, which allowed continuous benchmarking for consistency. If discrepancies were found between observers, the pair of observers jointly re–analyzed the periods in which the discrepancies were noted and come to a consensus code.

Next, frequency counts were totaled from the codes for each class session. Class sessions ranged from 46 minutes to 110 minutes. Sessions and frequencies were standardized, a 60 minute period. This yielded the frequency of behaviors per a standardized teaching period. Class sessions were categorized into sessions taught by high inclusion professors and sessions taught by low inclusion professors based on the scores instructors received for the dimension of inclusion on the teacher beliefs scale. Thus, the class session became the unit of analysis. Using this approach there were eight high inclusion sessions and five low inclusion sessions. An average frequency of individual behaviors was then assessed for high inclusion sessions and for low inclusion sessions independently.

Results

The intent of the results presented here is not for generalization to any population. The study sought to explore if a potential relationship exists between internalized beliefs of inclusion and verbal and nonverbal teacher immediacy behaviors. For this group of instructors the findings can serve as the foundation for future inquiry in this area.

Nonverbal Immediacy Behaviors

Frequencies for nonverbal immediacy teacher behaviors are presented in Table 1. The frequencies are presented for each class session and then averaged for high and low inclusion instructor sessions independently. The following behaviors were exhibited more frequently by high inclusion instructors per class session, than by low inclusion instructors: gestures while talking to class (f = 42.83), uses a variety of vocal expressions when talking to the class (f = 21.62), looks at the class while talking (f = 17.62), moves around the classroom while teaching (f = 16.97), has a relaxed body position while talking to the class (f = 15.35), smiles at individual students in the class (f = 5.50), stands behind desk or podium while teaching (f = 8.69), uses monotone/ dull voice when talking to the class (f = 1.80) and sits behind desk while teaching (f = 0.78; Table 1). Only one nonverbal behavior occurred more frequently in low inclusion class periods: looks at board or notes while talking to the class (f = 6.82). The faculty did not demonstrate four behaviors, including: touches students in class, smiles at the class while talking, sits on a desk or in a chair while teaching and has a very tense body position while talking to the class.

Verbal Immediacy Behaviors

Frequencies for verbal immediacy teacher behaviors are presented in Table 2. The frequencies are presented for each class session and then averaged for high and low inclusion instructor sessions independently. The following behaviors were exhibited more frequently by high inclusion instructors per class session, than by low inclusion instructors: asks questions to solicit viewpoints or opinions (f = 24.38), uses humor in class (f = 18.60), addresses students by name (f = 12.40), asks questions that have a specific, correct answer (f = 12.20), gets into discussions based on something a student brings up even when this doesn't seem to be part of his/her lecture plan (f = 11.91), uses personal examples or talks about experiences he/she has had outside class (f = 9.69), praises students' work, actions, or comments (f = 3.60), asks students how the feel about an assignment, due date, or discussion topic (f = 0.61), invites students to telephone or meet with him/her outside of class if they have questions or want to discuss something (f = 0.45), asks questions that have specific, correct answer (f = 12.20) and calls on students to answer questions even if they have not indicated they want to talk (f = 0.28; Table 2).

The following behaviors were exhibited more frequently by low inclusions instructors per class session, than by high inclusion instructors: asks questions to encourage students to talk (f = 29.34), refers to class

Table 1 Frequencies of Nonverbal Teacher Immediacy Behaviors for Instructors by Class Sessions

Nonverbal Behaviors	High Inclusion Class Sessions									Low Inclusion Class Sessions					
	1	2	3	4	5	6	7	8		1	2	3	4	5	
	f	*f*	*f*	*f*	*f*	*f*	*f*	*f*	Average	*f*	*f*	*f*	*f*	*f*	Average
Gestures while talking	5.8	84.5	23.6	14.9	45.2	110.4	41.8	16.5	42.83	38.1	-	12.3	35.4	18.0	20.76
Uses a variety of vocal expressions	4.4	49.9	34.7	7.4	31.6	19.2	11.0	14.6	21.62	20.3	-	9.0	-	-	5.86
Looks at class while talking	1.5	24.3	9.9	3.7	31.6	40.8	13.2	15.9	17.62	22.9	1.2	10.1	10.9	16.0	12.20
Moves around the classroom	2.9	2.6	-	9.9	27.1	67.2	18.7	7.3	16.97	43.2	-	13.4	5.4	-	12.41
Has relaxed body position while talking in class	1.5	7.7	17.4	12.4	27.1	28.8	12.1	15.9	15.35	38.1	-	11.2	10.9	-	12.04
Stands behind podium or desk	4.4	28.2	18.6	1.2	2.3	7.2	7.7	-	8.69	-	-	-	19.0	18.0	7.41
Looks at board or notes while talking	-	16.6	-	-	2.3	21.6	9.9	-	6.30	20.3	-	5.6	8.2	-	6.82
Smiles at individual students	1.5	11.5	2.5	7.4	5.6	12	2.2	1.2	5.50	19.1	-	2.8	2.7	-	4.91
Monotone/ dull voice	-	1.3	-	-	-	12	1.1	-	1.80	-	-	-	1.4	-	0.27
Sits behind desk	-	-	-	6.2	-	-	-	-	0.78	-	-	-	-	-	0.00
Physical contact	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-	0.00
Sits on a desk or in a chair while teaching	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-	0.00
Has a very tense body position when talking to class	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-	0.00

Note. Class sessions were standardized to 60 minutes.

Table 2 Frequencies of Verbal Teacher Immediacy Behaviors for Instructors by Class Sessions

Verbal Behaviors	High Inclusion Class Session									Low Inclusion Class Session					
	1	2	3	4	5	6	7	8		1	2	3	4	5	
	f	f	f	f	f	f	f	*f*	Average	f	f	f	f	*f*	Average
Solicits opinions	7.3	42.2	45.9	-	22.6	28.8	44.6	3.7	24.38	38.1	7.2	7.8	13.6	52.0	23.79
Encourages students to talk	2.9	60.2	27.3	2.5	15.8	33.6	22.0	18.9	22.90	66.0	2.4	21.3	49.0	8.0	29.34
Uses humor in class	26.3	55.0	32.2	-	2.3	16.8	6.6	9.8	18.60	15.2	2.4	2.2	2.7	11.0	6.72
Addresses students by name	1.5	24.3	5.0	11.2	6.8	14.4	15.4	20.7	12.40	7.6	-	12.3	2.7	6.0	5.73
Asks questions that have specific, correct answers	1.5	33.3	3.7	1.2	-	33.6	23.1	1.2	12.20	7.6	-	3.4	13.6	12.0	7.32
Has unrelated discussion based on student comments	2.9	17.9	18.6	21.1	15.8	7.2	4.4	7.3	11.91	2.5	2.4	4.5	2.7	2.0	2.83
Uses personal examples	2.9	11.5	8.7	-	6.8	28.8	6.6	12.2	9.69	2.5	-	-	10.9	-	2.68
Refers to class as “our” class or what “we” are doing	-	3.8	13.6	1.2	9.0	-	7.7	4.9	5.04	2.5	-	-	49.0	14.0	13.10
Praises students	1.5	15.4	3.7	1.2	2.3	2.4	1.1	1.2	3.60	12.7	4.8	-	-	-	3.50
Refers to class as “my” class or what “I” am doing	-	-	2.5	8.7	-	2.4	1.1	-	1.83	-	-	-	8.2	2.0	2.03
Holds conversations with individual students before or after class	-	1.3	1.2	-	3.4	-	2.2	0.6	1.09	1.27	2.4	1.7	1.4	1.0	1.54
Asks how students feel about coursework	1.5	-	-	-	-	-	2.2	1.2	0.61	-	-	-	-	2.0	0.40
Invites students to meet with him/ her outside of class for discussions	-	-	-	2.5	-	-	1.1	-	0.45	-	-	-	-	-	0.00
Will start discussions about things unrelated to class	-	-	-	-	-	-	-	-	0.00	-	1.2	-	2.7	-	0.78
Calls on specific students to answer questions	-	-	-	-	-	-	2.2	-	0.28	-	-	-	-	-	0.00
Criticizes or points out faults in students’ work	-	1.3	-	-	-	-	-	-	0.16	-	2.4	-	-	-	0.48
Is addressed by his/her first name by the students	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-	0.00

Note. Class sessions were standardized to 60 minutes.

as "our" or what "we" are doing (f = 13.1), gets into conversation with individual students before or after class (f = 1.54), will have discussion about things unrelated to class with individual students or with the class as a whole (f = 0.78), refers to class as "my" class or what "I" am doing (f = 2.03) and criticizes or points out faults in students' work, actions, or comments (f = 0.48). The following verbal behaviors were never exhibited in class sessions: addresses me by name, has initiated conversations with me before, after, or outside of class, provides feedback on my individual work through comments on papers, oral discussions, etc. and is addressed by his/her first name by the students.

Summary and Discussions

Following Ajzen's (1990) theory of planned behavior, defining beliefs should allow for predictions of behavior. This study investigated whether or not the beliefs of inclusion had an influence on the usage of immediacy behaviors. The intended hope was to continue to build a model of successful teacher practices for novice teachers to follow and answer the NRC (2009) challenge for enhanced instruction.

The data indicated that beliefs of inclusion do appear to influence the usage of immediacy behaviors. Therefore, for this group of instructors, the findings were congruent with the theory of planned behavior. When comparing class sessions taught by high inclusion instructors to those taught by low inclusion instructors, there were differences in the frequency of usage between 21 of the 34 immediacy behaviors. The differences of frequencies showed that high inclusion teachers exhibited the verbal behaviors: (a) uses humor in class, (b) addresses students by name, (c) gets into discussions based on something a student brings up even when this doesn't seem to be part of his/her lecture plan, (d) uses personal examples or talks about experiences she/he has had outside class, (e) praises students' work, actions, or comments and (f) asks questions that have specific, correct answers notably more often. The differences of frequencies which occurred between the nonverbal behaviors revealed that high inclusion teachers more frequently: (a) gesture while talking, (b) use a variety of vocal expressions and (c) look at class while talking most notably more often.

Based on the definition of inclusion, the notable differences of addresses students by name and discussion based on unrelated student comments are the most exemplary behaviors that demonstrate the influence of beliefs on behaviors. Overall, the fact that 62% of the immediacy behaviors had frequency differences indicates the influence of inclusion beliefs as well. The findings showed that teachers who believe in a more inclusive learning environment, exhibit behaviors more frequently demonstrating inclusive behaviors in the classroom.

A few observations contradicted what would be expected. Two notable differences occurred where behavior frequencies were higher for low inclusion class sessions. Low inclusion sessions referred to class ownership more frequently, both in the "our/we," and "my/I," possessive forms. Additionally, low inclusion classes encouraged students to talk more frequently. The concept of ownership is paramount to the inclusion definition, the class is owned jointly; of note however, low inclusion instructors tended to refer to the class more frequently overall, as stated, in both possessive forms. To have low inclusion instructors exhibit this behavior more frequently and be more encouraging of student talking is worthy of further investigation into potential reasons why.

These findings are congruent with other research in this area. Giorgi and Roberts (2011b) found that professors mirrored their beliefs for both dimensions, sensitivity and inclusion, in their teaching philosophies. Within that study, philosophies were considered espousals of beliefs and were operationalized as the intentions component of the theory of planned behavior (Ajzen, 1990). Additionally, similar immediacy behavior research conducted by Connor et al. (2011) concluded that using teacher immediacy behaviors could allow for students to feel more engaged in the content and feel comfortable within the learning environment. These previous findings add merit to the description of a potential model for successful teaching practices.

The findings of this study should not be generalized to any population; it sought to investigate the phenomenon within this small group of instructors. To further validate the findings and conclusions, further research with a larger group of faculty should be conducted. Additional research should seek to have a more diverse population of teacher beliefs represented.

For practical application, development of a teacher diagnostic tool should occur. As research in this area continues to grow, the findings and conclusions could be applied to the development of such a tool. A diagnostic tool could help predict or describe teacher's classroom practices and needs. Such a tool could help to develop appropriate professional development programs for faculty.

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College of Agriculture Satellite Campus Student Demographics and Alumni Level of Satisfaction

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Abstract

University of Georgia - Tifton, a satellite campus of the University of Georgia UGA, began offering 4-year degree programs in fall 2003. This descriptive, quantitative study surveyed alumni using an online and email questionnaire to examine demographics, educational background, job experience, interest in pursuing a further degree and level of satisfaction of campus education. Sixty four of the 66 alumni completed the survey with major findings included the following: 42 alumni (68%) were interested in pursuing a further degree, with the majority of respondents (51%) choosing the Master of Agricultural Leadership (online degree). Ninety five percent of Alumni were gainfully employed and engaged in a career related to their major. The alumni satisfaction level of education at UGA – Tifton is: 44 respondents (69%) were very satisfied, followed by 17 (26.5%) with a rating of satisfied.

Introduction

UGA is an 1862 land-grand institution serving the needs of students and industry. Within this greater institution lies the College of Agricultural and Environmental Sciences and it consists of three campuses found in Tifton, Griffin and Athens, with Tifton and Athens serving as the satellite campuses. Known primarily as an agricultural station for the past 90 years, UGA - Tifton Campus faculty are actively involved in agricultural research. There is now a total of 7,000 acres in South Georgia owned by UGA and a partnership with the United States Department of Agriculture (USDA) since 1924 has resulted in many successful research projects over the years (Esco and Watson, 2007).

Students take courses in Griffin, Tifton, or Athens as undergraduates or graduate students; in Tifton, individuals have the opportunity to obtain a Bachelor of Science (BSA) Degree in Agriculture and they may major in either Agriscience and Environmental Systems (AES) or Agricultural Education (AgEd). Two graduate degree programs, the Master of Agricultural Leadership (MAL) and the Master of Plant Protection and Pest Management (MPPPM), are now available at UGA - Tifton, with the MAL degree established fall 2006 and the MPPPM degree spring 2008. The student body on the UGA - Tifton Campus is small and class sizes have yet to exceed 25 students as of the 2012-2013 class and the student body generally consists of no more than 60 individuals, coming from various states and backgrounds.

This study is the first formal assessment of UGA's Tifton Campus alumni since academic programs began in Tifton in fall 2003. Sixty-six students graduated from the program during a three and a half-year period from fall 2004 to spring 2008. These students moved from college to a career, with little information being available as to their respective career and its relationship to their education at UGA. Also, relatively little data existed which identified student satisfaction with current majors offered on the campus. Although the program remains in relative infancy, administrators need to identify other majors in order to increase enrollment, serve new students and serve the employment needs of the state.

Purpose and Objectives

The purpose of this study is to describe UGA – Tifton Campus graduates and determine UGA - Tifton Campus alumni's level of satisfaction with academic programs on the UGA - Tifton campus.

1. Identify UGA - Tifton alumni demographic characteristics.

2. Describe the educational background of UGA - Tifton undergraduate alumni and determine student interest in pursuing a further degree.
3. Identify alumni's job experience and its relationship to their major at the UGA - Tifton Campus.
4. Identify alumni's level of satisfaction of education at the UGA – Tifton Campus.

Review of Literature for the UGA - Tifton Campus and Other Satellite Campuses

On August 18, 1918, the Georgia General Assembly passed a bill establishing a Georgia Coastal Plain Experiment Station (Cheek, 1984). The Georgia Coastal Plain soils proved productive in row crops such as cotton, peanuts and pine trees. As a result of this, agronomy was first area of study for the newly formed Tifton Experiment Station. Many other departments' soon emerged, including animal science, horticulture and biological and agricultural engineering, plant pathology, entomology and a veterinary diagnostic lab unit (Calheiros, et al., 2004). The campus is widely known for its breeding and variety release programs in aquaculture, turf grass, Bermuda grass, blueberries, pecans, sweet onion, peanuts and cotton. Compared to research and extension, the teaching program is relatively new, having commenced in fall 2003.

Relatively few studies are available concerning alumni level of satisfaction on satellite campuses, although a number of current studies are in progress. One example is the University of North Carolina (UNC) currently studying satellite campuses in hopes of expanding its college to other areas of the state. UNC is investigating whether its satellite campus should be decentralized in terms of faculty and staff being located on the satellite campus. With the loss of many manufacturing jobs in several counties, UNC sees the perfect opportunity to capitalize on the unfortunate event (Linker, 2008). Several other land-grant universities that operate satellite campuses similar to UGA - Tifton include the Universities of Florida, Kentucky, Minnesota, Nebraska and Wisconsin.

The University of Florida system offers several College of Agricultural and Life Sciences bachelor degree programs at Research and Education Centers (RECs) including Apopka, Ft. Lauderdale, Ft. Pierce, Milton and Plant City. Students take their first two years of courses at a community college and then transfer to a REC location for the remaining two years. Class sizes are generally small and students are able to develop close working relationships with instructors while seeing first-hand research. The Ft. Pierce program location offers a bachelor degree specializing in Food and Agribusiness Marketing and Management, while the Ft. Lauderdale REC offers four undergraduate degrees: Entomology, Environmental Horticulture, Geomatics and Turfgrass Science (University of Florida College of Agricultural and Life Sciences, 2008).

A 1992 study designed to evaluate the variables related to college attendance and employment outcomes contributing to perceived level of satisfaction for college alumni. Using a cross section of 47,408 graduates of various institutions, the study analyzed 13,481 of those who had obtained bachelor's degrees. Results pertinent to this study included graduates who had attended small, more selective institutions tended to have a higher sense of satisfaction with how their school had prepared them for employment opportunities (Schnitker, 1992). A quantitative study completed in 1994 investigated student satisfaction with the college experience at Butler County Community College in El Dorado, Kansas, comparing satisfaction between the home institution (Butler) and one of its accompanying satellite campuses. Using the College Student Satisfaction Questionnaire (1971), developed by Betz, Klingensmith and Menne, the researcher noted that students were overall satisfied with their college experience. The extent of student satisfaction varied both between and within each campus and students who attended the satellite campus were more satisfied (Stalnaker, 1994).

During the development of UGA - Tifton's bachelor program in 2000 and 2001, researchers surveyed Abraham Baldwin Agricultural College (ABAC) students and high school students to determine interest in creating an agricultural bachelor degree program. ABAC is within one mile of the UGA - Tifton and the sampled high schools were spread throughout Georgia, totaling 39 in 39 counties. One hundred seven ABAC students majoring in agricultural fields returned the questionnaire, with 80% indicating they would be interested in obtaining a bachelor degree from UGA - Tifton in AES if it were offered completely in Tifton (Riley and Vellidis, 2001). The high school aspect of the questionnaire process was much larger in scope. Two thousand questionnaires (identical to ABAC questionnaire) were sent out to high school seniors from rural and urban centers. Nine hundred nine respondents returned the questionnaire, with 35% expressing interest in obtaining a degree from UGA - Tifton, under the same conditions mentioned above (Riley and Vellidis, 2001).

Material and Methods

The methodology for this descriptive study consisted of quantitative data gained using a questionnaire composed by the Tifton Campus Curriculum Committee, made up of professors and administrators. Descriptive statistics were employed, means and frequencies were

reported. The instrument was online and emailed to the survey population (N=66), with subjects having the option of returning the questionnaire by fax. After the first round of responses was collected during a three-week period, non-respondents were contacted by telephone and asked to complete the questionnaire via email or fax. Sixty-four questionnaires were returned; therefore, non-response was not considered as a threat to external validity. This study was deemed exempt by the University of Georgia Institutional Review Board.

Instrumentation

No existing appropriate questionnaire could be located so a questionnaire designed by the Tifton Campus Curriculum Committee (professors and administrators) was utilized. Five objectives were developed and the questionnaire was structured to meet each object accordingly. Beginning with objective one, the educational background of participants was described and student interest in pursuing a further degree was also recorded. Objective two identified participants' job experiences and the relationship of these experiences to their major. The motivation of each alumnus for accepting their current job position was also explored. Objective three identified each participant's perceived satisfaction of their education while at the UGA - Tifton Campus, using Likert – type – scales. For these questions, a statement was provided and endpoints corresponded to very satisfied/relevant and very dissatisfied/irrelevant. The scale consisted of an even number of points (four), the respondent was encouraged to mark a specific choice (Sclove, 2001). Objective four determined each respondent's perceptions regarding suggestions for further majors or additional changes to the campus they deemed necessary, while the final objective (five) consisted of a demographics section.

All data collection was conducted by the researcher, with the majority (n=58) of questionnaires arriving via email. One questionnaire was received via fax and five arrived through the United States Postal Service. Face validity was guaranteed by a panel of experts consisting of UGA - Tifton administrators and professors. Test reliability was established using a pilot test using graduates from a neighboring university resulting in a Cronbach's Alpha of .84. Test administrator reliability was controlled by the use of a pre-notice example and a questionnaire cover letter example (Dillman, 2000). As a result, the questionnaire was structured in a manner that allowed each respondent to address each question from their current position.

Dillman's (2000) email questionnaire format and data collection protocols were utilized for data collection. Participants also had access to a computer and email, since all students had registered their contact information with the campus program coordinator. A pre-notice email message was sent four days prior to the actual questionnaire. This gave the respondent time to prepare for the questionnaire and it also reduced the likelihood of the respondent deleting the questionnaire upon arrival. The questionnaire was then sent to each respondent individually in order to increase confidentiality and increase response.

Results and Discussion

Objective one was to identify UGA - Tifton alumni demographic characteristics and the following demographics are based on the survey population, corroborated by the UGA - Tifton program coordinator. Twenty-five alumni indicated their gender as female (38%), with the majority (n=41) being male (62%) and all graduates were Caucasian (Table 1). Ages ranged from 22 to 44 with 30 graduates under the age of 25 (45%), 33 graduates between 25 and 34 (50%) and three graduates over the age of 35 (5%) (Table 2).

Objective two was to describe the educational background of UGA - Tifton undergraduate alumni and determine student interest in pursuing a further degree. The survey population had all obtained their bachelor's degree in agriculture, majoring in either Agricultural Education or Agriscience and Environmental Systems. Twenty-four students (36%) achieved their bachelor degree in Agricultural Education, while 42 students (64%) received bachelor degree in Agriscience and Environmental Systems (Table 3).

For all subsequent findings and discussion, the data is based on the survey sample (n=64) who returned the questionnaire. Forty-two alumni (68%) were interested in pursuing a degree beyond the one they currently had, while 20 alumni (32%) were not interested in pursuing a further degree (62 alumni answered this question; see Table 4). For those alumni interested in pursuing a further degree, 37 (58%) provided the major they would most like to pursue. Nineteen (51%) were interested in the Master of Agricultural Leadership (MAL) and/or School Administration, four Master of Plant Protection and Pest Management (MPPPM) and environmental/agricultural sciences (11%), three (8%) Business/Agribusiness and seven (19%) responded with other majors (Table 5).

Objective three identified each participant's job experience and its relationship to their major at the UGA - Tifton Campus. Sixty-one alumni (95%) were currently employed and three alumni (5%) were unemployed (Table 6). Regarding job description, 22 (36%) identified themselves as being in education, 14 (23%) local, state, or federal research, six extension and agricultural sales and services (10%), five (8%) corporate research, three

farming and construction and maintenance (5%) and two (3%) other occupations (Table 7).

Sixty students (94%) responded when asked if they had pursued jobs related to their major. Fifty-five (92%) said they pursued jobs related to their major, while five alumni (8%) did not pursue jobs related to their major (Table 9). Sixty-one alumni (95%) responded when asked if they were contemplating a job change within the next five years. Sixteen alumni (26%) stated they were planning a job change, with 45 former students (74%) not planning a change of occupation (Table 9).

For objective four, each participant was asked to rate his or her level of satisfaction of education at the UGA - Tifton Campus. Likert – type scales were utilized; a statement was given and endpoints corresponding to very satisfied/relevant and very dissatisfied/irrelevant were provided on a scale of 1 – 4. All respondents (N=66) answered each question in this section of the instrument. One respondent (1.5%) was very dissatisfied with the education they received at the campus and two respondents (3%) were dissatisfied. Seventeen alumni (26.5%) were satisfied and 44 alumni (69%) were very satisfied with their education at UGA - Tifton. A mean of 3.63 and standard deviation of 0.63 was calculated for objective four (Table 10). Participants were then asked to rate the relevancy of their major to their current job. Two alumni (3%) rated very irrelevant, followed by seven alumni (11%) who rated irrelevant. Twenty-six respondents (41%) rated their major as being relevant to their current job and 29 respondents (45%) rated their major as being very relevant to their job. A mean of 3.28 and standard deviation of 0.79 was calculated for objective four (Table 11).

Objective four was concluded by asking participants to rate to what extent were they satisfied with the quality of education they received at UGA - Tifton. No respondents rated very dissatisfied, while two respondents (3%) were dissatisfied with their quality of education. Twenty-four former students (38%) were satisfied with their education and 38 former students (59%) were very satisfied with the quality of education they obtained at UGA - Tifton. A mean of 3.56 and standard deviation of 0.56 was recorded for objective four (Table 12).

Table 1 Alumni Gender Demographics (N=66)

Gender	n	Percentage
Male	41	62
Female	25	38

Table 2 Alumni Age Demographics (N=66)

Age range	n	Percentage
Under 25	30	45
Between 25 and 34	33	50
Over 35	3	5

Table 3 Alumni Educational Background (N=66)

Education	n	Percentage
AES bachelor	42	64
AgEd bachelor	24	36

Table 4 Alumni Interest in Pursuing a Further Degree (N=66)

Interest	n	Percentage
Yes	42	68
No	20	32

Table 5 Further Degree Which Alumni Would Like to Pursue (N=66)

Major	n	Percentage
MAL/school administration	19	51
Other	7	19
MPPPM	4	11
Environmental/Ag Sciences	4	11
Business/Agribusiness	3	8

Table 6 Alumni Job Status (N=66)

Status	n	Percentage
Employed	61	95
Unemployed	3	5

Table 7 Alumni Employment Descriptions (N=66)

Description	n	Percentage
Education	22	36
Local/state/federal research	14	23
Extension	6	10
Ag sales & services	6	10
Corporate research	5	8
Farming	3	5
Construction/ maintenance	3	5
Other	2	3

Table 8 Similarity of Job Occupation to Major (N=66)

Status	n	Percentage
Job related to major	55	92
Job not related to major	5	8

Table 9 Possibility of Alumni Changing Job within Next 5 Years (N=66)

Status	n	Percentage
No	45	74
Yes	16	26

Table 10 Alumni Satisfaction Level Concerning Education at UGA - Tifton (N=66)

Satisfaction Level	n	Percentage	M	SD
Very Satisfied	44	69		
Satisfied	17	26.5		
Dissatisfied	2	3		
Very Dissatisfied	1	1.5		
			3.63	0.63

Note. Scale – (1 = very dissatisfied; 4 = very satisfied)

Table 11 Relevancy of Majors to Alumni's Jobs (N=66)

Relevancy rate	n	Percentage	M	SD
Very relevant	29	45		
Relevant	26	41		
Irrelevant	7	11		
Very irrelevant	2	3		
			3.28	0.79

Note. Scale – (1 = very irrelevant; 4 = very relevant)

Table 12 Alumni Satisfaction Level Concerning "Quality" of Education at UGA - Tifton (N=66)

Satisfaction level	n	Percentage	M	SD
Very satisfied	38	59		
Satisfied	24	38		
Dissatisfied	2	3		
Very dissatisfied	0	0		
			3.56	0.56

Note. Scale – (1 =very dissatisfied; 4 = very satisfied

Summary

From 2003 to 2007 the majority of students at UGA - Tifton were male. All alumni were Caucasian, which is an issue which the campus needs to further explore in order to encourage diversification. Most alumni (95%) obtained their bachelor's degree at UGA - Tifton shortly after completing their associate's degree, with 30 graduates being under the age of 25 and 33 graduates between 25 and 34.

A majority of 42 (68%) alumni showed an interest in pursuing a further degree. As for majors of interest, the Master of Agricultural Leadership (MAL) and/or School Administration were predominant, at slightly over 50%. Currently, this degree is offered at UGA - Tifton. However, the majority of alumni who wish to pursue this degree are teachers. Since the MAL degree is distance-learning, these students must allot adequate time in their schedules before pursuing such a venture. It is recommended that UGA - Tifton contact these interested individuals and discuss methods of completing the degree. Four alumni were also interested in pursuing the Master of Plant Protection and Pest Management (MPPPM) degree, which was started in fall 2007. This degree is not distance-education, which means that students must come to campus on a regular basis. These students currently have jobs and/or family, so it remains to be seen as to whether interest in this degree continues.

Almost all participants were employed (95%), most alumni were teachers (36%), followed by alumni involved in research. The research category was broken down into local, state, or federal versus corporate research. When combined, 19 alumni (31%) were in research-related jobs. Extension and agricultural sales and services both had six alumni (10%) employed. The AES degree exposes students to a broad research and technological spectrum, which helps explain why alumni are employed in research, extension and agricultural sales and services. When participants were asked whether they had pursued jobs related to their major, the majority (92%) responded that they had pursued jobs related to their major. As for contemplation of a job change within the next five years, most alumni (74%) stated they were not planning a job change during this interval.

The majority of respondents were very satisfied (69%) with their education, while 17 alumni (26.5%) were satisfied. The relevancy of each participant's major to their current job was then raised. Twenty-nine (45%) respondents rated their major as being very relevant to their job, while 26 (41%) rated their major as relevant to their current employment. Respondents were ultimately asked to rate to what extent were they satisfied with the quality of education they received at UGA - Tifton. The majority of alumni (59%) were very satisfied with the quality of education they received, followed by 24 (38%) rating their education received at UGA - Tifton as satisfied. Based on this data, the majority of alumni are very satisfied with the education they received at UGA - Tifton and most former students have been able to locate jobs relevant to their respective major.

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Agriculture Students' Perceived Competency of Skills Necessary to be Successful in College

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Abstract

One of the reasons college students fail to successfully complete a degree is poor academic and college skill preparation (U.S. Department of Education, 2011). This study attempted to identify deficiencies in skills considered necessary to be successful in college by surveying agriculture students at a two year agricultural college. Participating students were asked to indicate their perceived importance of and competency for each skill. Data was analyzed using Borich's model to calculate a Mean Weighted Discrepancy Score for each skill. The data indicated that students need the most assistance with "Eliminating distractions from your study environment" and "Dealing with stress in a healthy way." With these skill deficiencies identified, faculty and staff can take measures to improve students' competency in these skills and potentially increase student success.

Introduction

With the current economic crisis and high unemployment rate in our country, it is increasingly important for individuals to be competitive in the job market. Many of those looking for work do not have the skills required by companies looking to hire-resulting in high unemployment even as businesses desperately seek new talent (Bridgeland, et al., 2011, p. 2). In the United States, a gap has emerged between the needs of the employers and the education of the American workforce (Bridgeland, et al., 2011). If our nation fails to bridge this gap, we will risk our ability to compete effectively on the global stage (Bridgeland, et al., 2011, p. 2).

In the next decade, a postsecondary certificate or degree will be required by more than half of all new jobs; however, fewer than half of those who begin postsecondary training earn a certificate or degree within six years of initial enrollment (U.S. Department of Education, 2011, p. 2). In 2010, the average six-year bachelor's degree graduation rate for the state universities was 37.2%, while the rate for state colleges was a mere 13.9% (University System of Georgia, 2011). While the nation appropriately focuses on ensuring that more students graduate from high school ready for college, little attention has been paid to the hidden crisis of undergraduates who leave college and other post-secondary institutions before completing their degrees (Bridgeland, et al., 2011, p. 2). One of the reasons students fail to successfully complete a degree is poor academic and college skill preparation (U.S. Department of Education, 2011). If steps are taken to identify students' deficiencies in these college skills, institutions can take measures to improve students' competency in them and potentially increase student success.

In 2004, 45% of first-time freshman chose to begin the higher education experience through community colleges. Motivation to attend a community college may be influenced by several factors: geography, financial status, social climate and academic standing (Branson and Green, 2007, p. 5). Some students cannot fulfill academic admission requirements of large universities, so they begin their college career at a smaller two-year institution (Branson and Green, 2007).

Significant differences exist between students beginning their collegiate career at two-year institutions and those enrolling at four-year institutions (Johnson, et al., 1991, p. 41). Research indicates two-year college transfer students usually have lower test scores and grade point averages compared to students beginning their college career at a four-year institution (Johnson, et al., 1991). It has also been found that two-year college agriculture students were more likely to be from rural areas or small towns and were more likely to have been 4-H or FFA members than were students at four-year institutions (Johnson, et al., 1991).

Some studies have been conducted over the past few decades to determine if students who transfer from two-year institutions are adequately prepared for the upper-level coursework at four-year universities. Some studies have shown that transfer students have been less prepared than their non-transfer counterparts, while other studies have found preparation of upper level courses of both transfer students and their non-transfer counterparts to be equivalent (Branson and Green, 2007, p. 5). A study at Washington State University's College of Agriculture indicates that transfer students 1) have some difficulty in the first semester after transfer, 2) experience an adjustment shock and 3) require special counseling (Bennett, 1974, p. 87).

Regardless of where a student begins their college career, certain skills are necessary for the majority of students to be successful in college. Handel (2007) believes academic preparation is the single most important determinant of student success (p. 41). Townsend and Wilson (2006) said undergraduate students' persistence is influenced not only by their own characteristics, goals and commitments but also by their experiences academically and socially while in college, which indicates skills necessary for students to be successful at a four-year institution can be learned in the process (p. 2).

New programs, such as learning communities and first-year seminars, are being implemented in various institutions across the country to give new students and faculty the chance to know one another more intimately than in large lecture halls. The underlying assumption behind each of these practices is that the more students are involved in or integrated into college life, the greater the likelihood they will stay in college and attain their degree (Townsend and Wilson, 2006). While academic skills are a necessity for students to be successful, one must also take into account non-academic skills, which may determine success or failure for some students.

Some experts contend that helping students address these non-academic deficiencies is just as important as helping them acquire basic academic skills through remedial classes, which typically do not address issues such as study skills, goal setting and the like (Zeidenberg, et al., 2007). Karp (2011) believed there were four main mechanisms by which non-academic supports can improve student success at two-year colleges. They are: creating social relationships, clarifying aspirations and enhancing commitment, developing college know-how and making college life feasible (Karp, 2011). Gardener and Barefoot (2010) also attribute student success to being active on campus, as well as other student skills, such as time management, critical thinking, effective reading and writing skills and test- taking skills.

Purpose and Objectives

The purpose of this study was to determine if two year agricultural college students perceived themselves to be competent in skills necessary to be successful in college. By collecting data regarding the participating students' perceived importance and competency in a set of skills, this study sought to:

1. Determine what skills students in agriculture degree programs perceive as important to be successful in college
2. Determine skills students in agriculture degree programs perceive they are competent in
3. Determine what skill sets do students in agriculture degree programs need the most training in to be successful in college

Material and Methods

An attempt was made to collect data from all of the approximately 100 students in an agricultural major at a two year agricultural college who were attending courses during the summer term of 2011. Participants were given a questionnaire modeled after the Minnesota Beginning Agricultural Education Teacher In-service Programming Needs Assessment (Joerger, 2002), which included questions about demographic information, as well as a list of 114 skills deemed important for college success by Gardner and Barefoot (2010). For each skill listed, students were asked to indicate their perceived level of importance and their perceived level of competence. The Likert-type scale ranged from Not Important (1) to Very Important (5) and Not Competent (1) to Very Competent (5).

The questionnaire was developed using subject matter from each chapter of Gardner and Barefoot's (2010) Step by Step to College and Career Success textbook, which is used for freshman seminar courses taught at the two year agricultural college. Before being administered to participants, the questionnaire was reviewed by members of the two year college Institutional Research Board and by faculty members at a state land grant university. The researcher modified the instrument based on recommendations from these two groups before distributing the questionnaire.

The instrument was administered over a two-week period to 70 students in six different agricultural courses being taught during the summer 2011 term at the two year agricultural college. The courses ranged from 1000-level to 3000-level courses and included topics in business, forestry, mechanics and plant science. Completed instruments were collected from all 70 participants. Due to the fact that the questionnaire for this study was given during the summer term, only a small percentage (~7%) of all agriculture students enrolled at the two

Table 1. Mean and Standard Deviation for Highest Ranked Skills based on Perceived Importance

Skill	Mean	SD
Managing your finances	4.87	0.41
Knowing how to perform well in an interview	4.81	0.39
Selecting a major you feel passionate about	4.81	0.46
Knowing how to avoid contracting a sexually transmitted infection	4.80	0.44
Using class notes to prepare for an exam	4.79	0.45
Reading exam questions carefully	4.76	0.52
Knowing how to prepare a strong résumé	4.71	0.54
Understanding how to write an effective cover letter to accompany your résumé	4.70	0.49
Creating a workable class schedule	4.69	0.55
Understanding the consequences of abusing legal and illegal drugs	4.69	0.69
Considering which careers match your abilities	4.69	0.50
Practicing academic honesty	4.67	0.74
Knowing when to use formal vs. informal English in email communication	4.66	0.59
Editing writing assignments before submitting them	4.64	0.66
Finding the entry requirements for the major that interests you	4.64	0.59
Setting long-term goals	4.63	0.59
Being in class on time	4.63	0.54
Having a good idea of the skills you'll need to succeed in any career	4.63	0.57
Organizing information to be presented in your speech	4.61	0.60
Knowing what it takes to be a good friend	4.61	0.57

Note. 1 = Not important; 2 = Of little importance; 3 = Somewhat important; 4 = Important; 5 = Very important.

year agricultural college were present on campus to participate in the study.

The data was entered into and analyzed using functions of an Excel™ spreadsheet. Cronbach's α for this study was calculated to be 0.97. Formulas based on the specifications of the Borich Needs Assessment Model (Borich, 1980) were created for determining the prioritization of the skill deficiencies. Joerger (2002) described Borich's procedure: A discrepancy score was initially calculated for each student for each competency by subtracting the competency score from the importance score. A weighted discrepancy score was then calculated by multiplying the discrepancy score by the mean importance rating for each competency. A mean weighted discrepancy score (MWDS) was calculated by taking the sum of the weighted discrepancy scores and dividing by the number of complete participant responses for the competency (p. 13).

Results and Discussion

Of the 70 responding students, 39% (27) were pursuing a degree in Diversified Agriculture, 24% (17) in Wildlife, 21% (15) in Forestry and the remaining 16% in other agricultural areas. The majority of respondents (73%) were male and the average age of respondents was 22.5 years (SD=4.1). Data regarding race was not collected as part of this study.

Table 2 Mean and Standard Deviation for Highest Ranked Skills based on Perceived Competency

Skill	Mean	SD
Selecting a major you feel passionate about	4.69	0.65
Knowing how to avoid contracting a sexually transmitted infection	4.66	0.70
Avoiding tobacco products, even in moderation	4.57	0.89
Practicing academic honesty	4.53	0.78
Knowing what it takes to be a good friend	4.51	0.79
Considering which careers match your abilities	4.41	0.73
Having a set of values that genuinely makes sense to you	4.40	0.86
Understanding how to maintain good communication with your family while in college	4.34	0.87
Reading exam questions carefully	4.33	0.86
Knowing when to use formal vs. informal English in email communication	4.31	0.81
Having a good idea of the skills you'll need to succeed in any career	4.31	0.77
Knowing the difference between responsible and irresponsible alcohol use	4.30	1.04
Being in class on time	4.29	0.84
Knowing what to do if you ever find yourself in an abusive relationship	4.27	1.19
Knowing what to do when some aspect of a friend's behavior clashes with your personal values	4.27	0.80
Knowing how to perform well in an interview	4.27	0.82
Managing your finances	4.24	0.84
Choosing effective visual aids for your speech	4.24	0.81
Creating a workable class schedule	4.21	0.90

Note. 1 = Not competent; 2 = Little competence; 3 = Somewhat competent; 4 = Competent; 5 = Very competent.

Table 3. Most Needed Skills Based on Mean Weighted Discrepancy Score

Skill	MWDS
Eliminating distractions from your study environment	4.75
Getting enough sleep	4.68
Dealing with stress in a healthy way	4.46
Raising your hand when you don't understand something	4.08
Concentrating while reading a text	3.99
Beginning to study for an exam at least a week in advance	3.85
Reviewing what was said in your class after the class is over	3.71
Not overextending yourself	3.54
Using relaxation techniques to combat stress	3.37
Reciting key ideas to yourself after reading	3.35
Feeling comfortable asking all types of questions	3.29
Speaking up in class	3.23
Using a dictionary to check the meaning of unfamiliar words while reading	3.15
Making your physical health a priority	3.08
Managing your finances	3.06
Precise communication: presenting your ideas convincingly to others	3.05
Exercising regularly	3.03
Taking notes on the class discussion, not just the lecture	3.03
Setting long-term goals	2.98
Knowing how to prepare a strong résumé	2.96

Objective 1 of this study asked, What skills do students in agriculture degree programs perceive as important to be successful in college? Based on the data analyzed from the questionnaire, the participating students ranked "managing your finances" as the most important skill to be successful in college, with a 4.87 mean on a 1-5 scale. Tied for the second most important

skill was "knowing how to perform well in an interview" and "selecting a major you feel passionate about," with a 4.81 mean on a 1-5 scale. Table 1 represents the 20 skills with the highest rank based on students' perceived important to be successful in college.

Objective 2 of this study asked, "*What skills do students in agriculture degree programs perceive they are competent in?*" Based on the data analyzed from the questionnaire, the participating students ranked Selecting a major you feel passionate about as skill they were most competent in, with a 4.69 mean on a 1-5 scale. The skill students perceived themselves to be the second most competent in was Knowing how to avoid contracting a sexually transmitted infection, with a 4.66 mean on a 1-5 scale. Table 2 represents the twenty skills with the highest rank based on students' perceived competency.

Objective 3 of this study asked, "*What skill sets do students in agriculture degree programs need the most training in to be successful in college?*" Based on Borich's Mean Weighted Discrepancy Score (MWDS), the skill that students indicated needing the most training in was "eliminating distractions from your study environment," with a MWDS of 4.75. The second most needed skill according to the data was "getting enough sleep," with a MWDS of 4.68. Table 3 represents the twenty skills in which students perceive needing the most assistance with, based on Mean Weighted Discrepancy Scores.

Summary

Based on the data analyzed from the questionnaire, the participating students ranked "managing your finances" as the most important skill to be successful in college, with a 4.87 mean on a 1-5 scale. Tied for the second most important skill were "knowing how to perform well in an interview" and "selecting a major you feel passionate about," with a 4.81 mean on a 1-5 scale.

Based on the data analyzed from the questionnaire, the participating students ranked "selecting a major you feel passionate about" as the skill they were most competent in, with a 4.69 mean on a 1-5 scale. The skill students perceived themselves to be the second most competent in was "knowing how to avoid contracting a sexually transmitted infection," with a 4.66 mean on a 1-5 scale.

Based on Borich's Mean Weighted Discrepancy Score (MWDS), the skill that students indicated needing the most training in was "eliminating distractions from your study environment," with a MWDS of 4.75. The second most needed skill according to the data was "getting enough sleep," with a MWDS of 4.68.

Recommendations

The data implies two year agricultural college students believe managing their finances is the most important thing they can do to ensure their college success. With the current economic status of our nation and the ever-increasing cost of tuition and fees it is no surprise that financial management is on the top of their list. Unfortunately, many students do not come to college possessing adequate money management skills, partially because the subject is not required to be taught in the state's high schools. The subject of financial management is covered somewhat in two year agricultural college's freshman seminar courses, but not all students take the course and it is up to the instructor as to what and how much, if any, of the subject is taught. The researcher recommends implementing a standardized financial management component to all two year agricultural college freshman seminar courses.

Based on the weighted scores of this study, two year agricultural college students would like the most help with eliminating distractions from their study environment. Further research could be done to determine which distractions in particular are affecting the students' study time. This information could help two year agricultural college staff to know what can be done to assist students with this issue.

Implications for Future Research

The questionnaire for this study was given during the summer term of 2011, which means only a small percentage (~7%) of all agriculture students enrolled at two year agricultural college were present on campus to participate in the study. The questionnaire should be re-administered during a fall semester in order to capture the most responses. Likewise, the study could be expanded to include students enrolled in all of the schools at the two year agricultural college in addition to the School of Agriculture and Natural Resources.

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An Analysis of a Tablet PC Enhanced Learning Environment in the Agricultural Sciences

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Abstract

The purpose of this study was to analyze the perceptions of students and instructors in relation to the use of tablet personal computers (tablet PCs) in the learning environment of a Geographical Informational Systems/Geographical Positioning System (GIS/GPS) undergraduate course, offered within a university biological/agricultural engineering program. Students agreed that the incorporation of the tablet PCs into the learning environment heightened their overall learning experience, provided a more interactive learning environment and that the mobility of the tablet PCs allowed them to use GIS applications in a way that stationary units would not have facilitated. In this study, the instructors felt that the use of the tablet PCs enabled the class to do more and in a faster time. The instructors felt that the students were motivated and more interested in using the tablet PCs compared to traditional computers. In relation to gender, there were two statistically significant differences related to tablet PC use. Overall, the use of tablet PCs within the learning environment was perceived to have a positive impact for students enrolled in the GPS/GIS course as well as the instructors.

Introduction

Education is an ever-evolving method of disseminating knowledge from one person to another. As society continues to evolve and change for the better, so must education. Technology has grown extensively in a short period of time and for years educators have explored ways in which technology can aid with learning (Baguley, 2004). Globally, educators and professionals realize the importance of having students become independent thinkers, explore complex problems and apply the knowledge to real-life situations, which can be optimized by using technology within the classroom (Simonson and Thompson, 1997). With educators and professionals searching to find ways to incorporate instructional technology in education, many computer developers began to focus on creating tools that could enhance hands-on learning activities as well as provide an easier way to stay connected to the students both inside and outside of the classroom (Nah et al., 2005). These aforementioned concepts grew into what is now called mobile education or mobile learning. Mobile technologies have provided unique opportunities for educators to deliver educational materials efficiently and to support the cognitive and social processes of student learning. Students can communicate and interact

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with their peers, classmates and educators in real-time using mobile technology. Mobile technology can also be integrated into curriculum design to improve interactivity in the classroom (Nah et al., 2005).

The aforementioned topic of mobile technology plays a vital role within instructional technology today. Technologies, such as the tablet PC, is a tool used to help provide information literacy to educators, learners and professionals alike. The tablet PC is a technology tool based upon interactive pen-based computing. Released in 2002, the tablet PC has grown tremendously in popularity, particularly among educators. These computers run on a variety of platforms with an active screen for pen-based computing. The hard drives of tablet PCs today are just as powerful as many desktop machines with the added bonus of mobility. The screen on a tablet PC allows the user to complete multiple interactive tasks (Mock, 2003). Educators and professionals alike have begun to utilize tablet PCs in their fields. Educators use the tablet PC as a hands-on learning tool that can travel both inside and outside of the classroom. Professionals are using the mobility of the tablet PC to assist in numerous tasks such collecting data or formulating GIS (Geographic Information Systems) maps directly into the tablet PC. The ability to have access to technology outside of the traditional four walls of a classroom or office is of great appeasement to those who use the tablet PC. As time goes on and technology improves, it is safe to say that the tablet PC use in society will increase (Hewlett-Packard, 2008). Given the aforementioned factors what impact could such technology have upon the agricultural instructional environment, particularly within a GIS-biological engineering course? The National Research Agenda for Agricultural Education in Priority 2 emphasizes the development of new technologies and practices in order to disseminate agricultural knowledge to a plethora of stakeholders (Doefert, 2011).

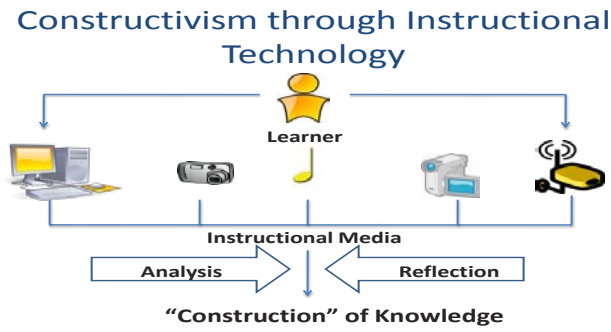
Theoretical Framework

Ormrod (2008) defined a theory as an explanation about the underlying mechanisms involved in learning. Ormrod (2008) also stated that theories serve two purposes: (1) allow one to summarize the results of many research studies and integrate numerous principles of learning and (2) theories provide starting points for conducting new research. Simonson and Thompson (1997) stated, "Theories can provide direction to the practice of a profession" (p. 147). In the field of instructional technology there are several theories that guide the focus of research and practice. These theories include constructivism, which will serve as the basis of this study.

Constructivism

In recent decades, it has become apparent that many learners do not simply absorb educational information as they encounter it. Some people actively try to organize and make sense of newly acquired information, often in unique, idiosyncratic ways. Constructivism is founded on the belief that "*there is a real world that is experienced but that meaning and understanding of the world are imposed by the person*" (Simonson and Thompson, 1997, p. 43). Today, many cognitive theorists now portray learning more as constructing knowledge rather than directly acquiring it from the outside world (Ormrod, 2008). Constructivists believe that learners create their own meaning from instructional activities and real-world experiences as described in Figure 1. Through these experiences with various forms of instructional media, meaning is gained, which can be utilized through the use of instructional technology (Simonson and Thompson, 1997).

Figure 1. Constructivism through Instructional Technology Model



Purpose and Objectives

The purpose of this study was to determine the perceived impact on tablet PC use within a biological and agricultural engineering environment. To accomplish the purpose, the following research questions were developed:

1. What was the perceived impact of tablet PC use upon the instructional environment within a biological and agricultural engineering course as perceived by students?
2. What was the perceived impact of tablet PC use upon the instructional environment within a biological and agricultural engineering course as perceived by instructors?
3. What was the perceived impact of tablet PC use by demographics of the study participants?
4. What were the demographic characteristics of the study participants?

To test the demographic research question the following hypothesis were identified:

- H01. There are no differences in perception of

tablet PC use by a student's gender within a biological and agricultural engineering course.
- H02. There are no differences in perception of tablet PC use by a student's major within a biological and agricultural engineering course.
- H03. There are no differences in perception of tablet PC use by a student's classification within a biological and agricultural engineering course.

Methodology

The population for this study consisted of students enrolled in a sophomore-level Geographic Information System course at a land grant university. Participants (n = 46) were recruited over a two-semester time frame in which the study took place. The same instructors (n = 2) taught the course for each of the two semesters. At the time of this study, surveys suitable to meet the research objectives were not found; therefore, two separate survey instruments were developed by the researchers based upon the research questions for this study and with the aid of an exhaustive literature review. The first survey instrument was entitled GIS Tablet PC Evaluation - Student Form. This survey instrument was comprised of one section of seven Likert-type questions consisting of the following responses: 0=Neutral, 1=Strongly Disagree, 2=Somewhat Disagree, 3=Somewhat Agree, 4=Agree and 5=Strongly Agree. Additionally, combinations of both open and closed questions for demographic purposes were asked. The second survey was entitled GIS Tablet PC Use - Professor Reflection Form. This survey was comprised of three open-ended questions about tablet PC use. This study was approved by the NC A&T State University Institutional Review Board, which included informed consent notification for participants given in the form of a consent form with the survey.

The validity of the instruments was established by means of content and face validity. Brown (1983) defined content validity as "the degree to which items on a test representatively sample the underlying content domain" (p. 487). Brown recommended using expert judges as one means of establishing content validity. A panel of experts at the Land Grant University with expertise in the content reviewed the survey instrument for content validity. After the reviews were conducted, the surveys were considered to be valid based upon the research questions of the study. In order to establish the reliability of the survey instruments, a post-hoc test was conducted with students enrolled in the GIS course. The Cronbach's alpha reliability coefficient for the student survey was .88.

In reference to data collection, a post-course methodology was employed for students enrolled in the biological and agricultural engineering GIS course as well as the instructor. The students were asked to provide their perceptions of using tablet PCs in order to learn GIS concepts in the course, 46 surveys were returned. Additionally, the instructors were asked to provide their perceptions of the impact of tablet PC use within the course. The data collected from the respondents were coded, entered and analyzed using the Statistical Package for Social Science (SPSS), Personal Computer Version 18.0.

Findings

Research Question One

Students in the course were asked to share their views about the impact of tablet PC use on their instructional environment. Table 1 displays the mean and standard deviation (SD) regarding their perceptions. The following specifications are provided to interpret the scale for the table: 0.00-0.99=Neutral, 1.00-1.49=Strongly Disagree, 1.50-2.49=Disagree, 2.50-3.49=Undecided, 3.50-4.49=Agree and 4.50-5.00=Strongly Agree.

Table 1. Perceived Impact of Tablet PC Utilization upon the Instructional Environment

Student Perception	M	SD
1. The mobility of the laptop allowed me to do GIS applications that stationary units would not have facilitated.	4.24	0.993
2. The use of tablet PCs provided a more interactive learning environment.	4.09	0.890
3. The instructors provided adequate instructions on how to utilize the tablet PC in relation to GIS.	3.98	1.064
4. Overall, the utilization of tablet PCs enhanced my learning experience in relation to GIS.	3.96	.942
5. Utilizing the tablet PC for GIS applications increased my overall technological literacy.	3.65	1.079
6. After the utilizing the tablet PC equipment with Arc GIS, I am now more knowledgeable of GIS.	3.63	0.997
7. The use of tablet PCs improved my overall knowledge base regarding GIS.	3.52	1.150

In relation to the impact of tablet PC use, students agreed that the mobility of the tablet PC allowed them to complete GIS applications that stationary units would have not facilitated. Students agreed that the use of tablet PCs provided a more interactive learning environment. In reference to tablet PC use in the instructional environment, students agreed that the instructor provided adequate instructions about how to use the tablet PC in relation to GIS. Students agreed that overall, the use of the tablet PC enhanced the learning experience in relation to GIS. In relation to GIS applications, students agreed that using the tablet PC for GIS applications increased overall technological literacy. Lastly, students agreed that using the tablet PC for GIS applications increased overall technological literacy.

Research Question Two

The second research question asked the instructors of the course to share their views about the students' use

of the tablet PCs with respect to GIS instruction. The responses from the instructors' reflection form were as follows:

1. What are the most valuable aspects of incorporating the mobile technology into the GIS/GPS course?

Fall Semester

"The students can immediately see the relevance of the lecture to field work. In the future classes, the mobile aspect will be introduced a little earlier so that students will be able to work with their own data (based on their major) to get a feel on how GIS/GPS can be applied to their field of study and thereby become more connected to the process. You can see the work instantly in a simpler process than with the alternate method."

Spring Semester

"The mobile technology requires fewer steps to get a task completed. The students were more interested in using the tablet and its external device in a simple process rather than a more complex and tedious process. Students were exposed to current technology and tools that they will likely encounter in their jobs after graduating."

2. What challenges have students faced with the mobile technology in relation to GIS instruction?

Fall Semester

"There were a few issues with connectivity. It was also a bit rushed. The monitors of the tablet PCs were hard to read in the sunlight. The students did not realize that they could and should have deactivated the GPS component before and after taking points to avoid unwanted lines or courses. More time will be allocated to field techniques and other efforts in the future."

Spring Semester

"It is difficult to see the screen on a sunny day. It was a challenge, though not insurmountable, to get the GPS unit 'talking to' or seeing to the computer. The stylus is not user-friendly and not easy to set for one individual since several students will use a given unit in each semester. The mouse is tiny and difficult for large-fingered students to work with."

3. Overall what is your general impression regarding the incorporation of the mobile technology into the GIS/GPS course, particularly compared to past sections of the course?

Fall Semester

"The students appreciated the fact that several steps were eliminated in getting their data into shapefiles. It is the opinion that they (students) were more motivated as well because the tablets were fun to work with since using the hand held GPS units require several steps to get the data in the form of a shape file."

Spring Semester

"The instructors and students were impressed with the units. The PCs enable us to do more and do so faster since certain steps were eliminated or reduced. In comparison with a former approach, the students were able to undertake additional projects where in the former approach they were unable. In one case, one team was able to complete their project and was able to assist another group. This was not observed in past sections. In previous sections prior to the use of the tablet PC, students would struggle to complete a medium-sized task. The ability to teach at a faster pace through the use of the tablet PC is very beneficial to the course."

Research Question Three

In the fourth question of the study, the researcher tabulated the perceived impact of tablet PC use by the demographic variable. With regard to question two, there was a statistically significant difference by gender as revealed by a T-Test (Table 2). Males agreed that tablet PCs provided a more interactive learning environment in contrast to the females who only somewhat agreed. There was also a statistically significant difference in responses by gender in question six. Males agreed that after the using the tablet PC equipment with Arc GIS, they were more knowledgeable of GIS. Females, however, only somewhat agreed. Based upon the aforementioned results, the researchers rejected the null hypothesis of no differences in Tablet PC use perception by student gender.

Table 3 lists the perceived impact of tablet PC use upon the instructional environment by class. ANOVA testing was done to determine if any differences existed.

Table 2. Perceived Impact of Tablet PC Utilization by Gender

Gender Perceptions	Gender	*M*	*t*	*p*
1. The mobility of the tablet PC allowed me to do GIS applications that stationary units would not have facilitated.	Male Female	4.20 3.73	1.561	0.126
2. The use of tablet PC's provided a more interactive learning environment.	Male Female	3.71 2.91	2.102	*0.041
3. The instructors provided adequate instructions on how to utilize the tablet PC in relation to GIS.	Male Female	4.09 3.64	1.228	0.226
4. Overall, the utilization of tablet PC's enhanced my learning experience in relation to GIS.	Male Female	4.34 3.91	1.272	0.210
6. After the utilizing the tablet PC equipment with Arc GIS, I am now more knowledgeable of GIS.	Male Female	3.80 3.09	0.924	*0.038
7. The use of tablet PC's improved my overall knowledge base regarding GIS.	Male Female	4.03 3.73	2.138	0.361

Note, *p <0.05= statistically significant difference

The study participants were those students who were enrolled in the course over a two-semester time frame. There were no statistically significantly differences based upon class, thus the researchers failed to reject the null hypothesis of differences by class.

Table 3. Perceived Impact of Tablet PC Utilization by Class

Class Perception	*F*	*p*
1. The use of tablet PCs provided a more interactive learning environment.	0.929	0.457
2. The use of tablet PCs improved my overall knowledge base regarding GIS.	0.292	0.881
3. The instructors provided adequate instructions on how to utilize the tablet PC in relation to GIS.	0.720	0.583
4. The mobility of the tablet PC allowed me to do GIS applications that stationary units would not have facilitated.	0.681	0.609
5. Utilizing the tablet PC p for GIS applications increased my overall technological literacy.	0.886	0.481
6. After the utilizing the tablet PC equipment with Arc GIS, I am now more knowledgeable of GIS.	0.968	0.435
7. Overall, the utilization of tablet PCs enhanced my learning experience in relation to GIS.	1.046	0.396

Note, *p <0.05= statistically significant difference

Table 4 addresses the perceived impact of tablet PC use on the instructional environment by major. The study participants were students enrolled in a BIOE 216 Geographic Information System course over a two-semester time frame. The survey was distributed by the instructor and completed by the study participants at the conclusion of the course. ANOVA testing was done to determine if any differences existed. The table shows that there were no statistically significantly differences based upon major, thus the researchers failed to reject the null hypothesis of differences by major.

Table 4. Perceived Impact of Tablet PC Utilization by Major

Major Perceptions	*F*	*p*
1. The use of tablet PCs provided a more interactive learning environment.	.795	.634
2. The use of tablet PCs improved my overall knowledge base regarding GIS.	.762	.663
3. The instructors provided adequate instructions on how to utilize the tablet PC in relation to GIS.	.341	.963
4. The mobility of the tablet PC allowed me to do GIS applications that stationary units would not have facilitated.	.476	.894
5. Utilizing the tablet PC for GIS applications increased my overall technological literacy.	.593	.808
6. After the utilizing the tablet PC equipment with Arc GIS, I am now more knowledgeable of GIS.	.507	.873
7. Overall, the utilization of tablet PC's enhanced my learning experience in relation to GIS.	.935	.514

Note, *p <0.05= statistically significant difference

Research Question Four

Table 5 addresses the demographic data of the students who participated in the survey. In relation to the semester in which students were enrolled, 54.3% of the students were enrolled in the fall semester and 45.7% of the students were enrolled in the spring semester. In relation to gender, 76.1% were males and 23.9% were female. In relation to the classification of students, 19.6% were freshmen, 39.1% sophomores, 30.4% juniors, 8.7% seniors and 2.2% graduate level.

Table 5. Demographics of Students

Demographics	*n*	%
Semester:		
Fall 2008	25	54.3
Spring 2009	21	45.7
Gender:		
Male	35	76.1
Female	11	23.9
Classification:		
Freshman	9	19.6
Sophomore	18	39.1
Junior	14	30.4
Senior	4	8.7
Graduate	1	2.2
Major:		
Civil Engineering	24	52.2
Biological Engineering	9	19.6
Architectural Engineering	2	4.3
Bioenvironmental Engineering	2	4.3
Mechanical Engineering	2	4.3
Soil Science	2	4.3
Agricultural Business	1	2.2
Construction Management	1	2.2
Environmental Science	1	2.2
Landscape Architect	1	2.2
Technology Education	1	2.2

Conclusions

Students who were enrolled in the GIS/GPS agreed that the incorporation of the Tablet PCs into the learning environment heightened their overall learning experience. These students agreed that the tablet PCs provided a more interactive learning environment and that the mobility of the tablet PCs allowed them to do GIS applications that stationary units would not have facilitated. These positive perceived impacts are supported by Beam (2008), who stated that the application of mobile technology in education can provide benefits to both students and educators. Mobile technology provides greater flexibility in student learning. Students can have access to educational materials through their mobile devices, which enables them to learn when the need arises and when the time is right for them, no matter where they are—even when they are on the move. This indicated that as perceived by students, tablet PCs have a positive impact upon the learning environment (Beam, 2008). Shuler et al., (2010) indicated that students perceived table PC's to have a positive impact upon the learning environment, in addition to increasing cooperative learning and enhancing technological competence.

Simonson and Thompson (1997) stated that many experts in the field of education realize that technology is an essential component to support the academic world. Although education once relied only on books, chalkboards and teachers, education now uses technology to enhance the learning environment. In this study, the instructor felt that the use of tablet PCs "enabled the class to do more and do so faster." The instructor felt that the students were more motivated as well because the tablets were fun to work with since using the hand-

held GPS units required several steps to get the data. The instructor also felt that students were more interested in using the tablet and its external device because of its simpler process to complete a task in the course. These findings are supported by Swan et al. (2005), who stated that *"many teachers are finding that once they incorporate technology in the classroom, it benefits their students by engaging them in ways they are familiar with and enjoy, which ultimately makes their job easier"* (p.270). These findings indicate that instructors feel that the use of tablet PCs in the learning environment are positive.

In relation to gender, there were two statistically significant differences related to tablet PC use. Females "somewhat agreed" that the use of tablet PCs provided a more interactive learning environment when, in contrast "males agreed." Females also "somewhat agreed" that after using the tablet PC equipment with Arc GIS they were more knowledgeable of GIS, while males within the course "agreed." Chaika (1999) found that males and females have a tendency to view computers differently in their use. Males tend to perceive technology as mechanical tools, while females tend to perceive technologies as social tools (University of Illinois, 2011). The masculine hands-on nature of the tablet PC caters more towards males than females, which can alter the perception of its usefulness in regards to the female perspective (The Center for Women and Information Technology, 2011; Kay, 2007). Though the perception of tablet PCs use within the learning environment varies by gender, overall, the use of the tablet PC in the learning environment is perceived to be positive. The demographic data showed that there were no statistical differences based upon major or classification.

Recommendations

Overall, the use of tablet PCs within the learning environment was perceived by students and the instructor to have a positive impact. After analyzing the data in this study, the following recommendations were made:

1. Instructors within the biological and agricultural engineering program could consider more activities that utilize instructional technology in the learning environment.
2. Instructors within the biological an agricultural engineering program could incorporate the use of mobile technology into the learning environment.
3. Instructors within the biological and agricultural engineering program could develop evaluation plans to identify the impact that instructional technology has on their respective courses.
4. Instructors within the biological and agricultural engineering program could develop and incorporate instructional methods of teaching that are not gender biased in the learning environment.

Implications

Educators across the globe are undergoing major changes in curricula to incorporate instructional delivery approaches. As these changes occur, programs within the field of agriculture have realized that instructional technology is a major area of concern. This concern has motivated educators to use instructional technology in the classroom. The findings of this study showed the importance of instructional technology to learning environments within the collegiate setting, especially computer-based technologies. This research study indicated the importance of the use of instructional technology in agriculturally based learning environments. Perhaps the results of this study could provide teachers within the field of agriculture a foundation upon which to create and implement methods for the infusion of instructional technology into the education curriculum. If implemented effectively, instructional technology can positively impact students' learning within agricultural learning environments. This trend could lead to the creation of more interactive, multi-media computer software and internet sites focused on the individual student's exploration of new agricultural knowledge and greater use of their cognitive skills. Instructional technology infusion into learning environments within the field of agriculture will provide students with many avenues for learning and exploration. Instructional technology should be utilized as a tool for enhancing instruction in learning environments in the agricultural sciences.

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Academic Performance in a Two-Year Turfgrass Management Program as an Indicator for Career Success

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Abstract

Student academic performance, based on college final grade point average, tends to have a greater impact on career success in selected professions, most notably in the fields of law and medicine. Graduates with higher final GPAs customarily acquire more prestigious professional positions which result in higher compensation packages. Little information is available regarding the use of college academic performance as an indicator for career success in the turfgrass management industry. This study examines the relationship between student academic performance based on final college grade point average, in a two-year turfgrass management program and the success level achieved by graduates at least five years after graduation. Turfgrass management students typically view achieving success in the industry as being determined by securing high level professional positions such as golf course superintendents, sports turf facilities managers, landscaping managers, related business owners, or associated industry managers. This work focuses on turfgrass management graduates from the Ohio State University Agricultural Technical Institute (n = 347) between the years of 1996 and 2006. Data for this work was gathered through personal contact, alumni records and through industry professional organizational sources. Results of this particular study reveal that college graduates with higher grade point averages do not achieve higher levels of career success, both in professional positions held and compensation, than graduates with lower grade point averages in the turfgrass management industry.

Introduction

Career success can be viewed by both objective and subjective means. Objective measures of career success involve extrinsic factors such as salary amount and level of promotion whereas subjective measures of career success are exemplified by intrinsic factors such as job satisfaction or a sense of accomplishment (Judge et al, 1995, Gattiker et al, 1986). After reviewing several business studies, Calhoon and Reddy (1968) found an individual's salary level to be a consistent indicator of perceived occupational success. Additional work has provided an association between motivation and success. Waldman and Korbar (2004) designed a study to measure early career progress in the form of job satisfaction, number of promotions and current salary. Findings revealed that, although student GPA was not a good predictor of early career progress and success, salary was found to be a valuable indicator for student's perception of career success.

A literature search of four databases revealed no studies associated with using college final grade point average as an indicator for determining career success in the turfgrass management industry. A multitude of studies have been conducted over the past 100 years questioning the potential relationship between college grade point average and career success in other fields of endeavor.

The literature indicates –grade point average, impacts student's perceived career success in certain professions. "*Predictions of occupational performance from academic indexes were somewhat higher in business, law and nursing, somewhat lower in teaching and engineering*

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and not significant for MD's or PhD's [sic]." (Samson et al 1984). Economists have noted a positive relationship between undergraduate GPA and post college earnings (Wise, 1975, Filer, 1983). Sanders and Yakowitz (2011) determined that law school school GPA was an important predictor of career success in law.

A ten-year study conducted at the U.S. Air Force Academy to determine the factors that best predict military career success concluded the positive impact GPA had on success: "*a higher GPA would indicate a higher probability of career success as a military officer*" (Rodriguez, 2009). However, Rodriguez found that cadets' military performance average (MPA) had a higher impact on career success than GPA, which suggests that leadership ability has a greater influence on career success of Academy graduates than academic performance. In all, Rodriguez concluded that the "results suggest determinates [sic] of career success largely occur after graduation."

Hoyt (1965), one of the most referenced scholars in this discipline, completed a detailed review of 46 studies conducted from 1900 to 1965. Each of the studies was grouped into one of eight distinguishing categories: business, engineering, medicine, scientific research, teaching, miscellaneous occupations, studies of eminence and non-vocational accomplishments. Hoyt's findings suggested that the association between college grades and adult accomplishment was minute and possibly zero Nelson (1975) reviewed numerous studies and concluded: *"Although technical inadequacies of much research in this area make conclusions difficult to draw, much empirical evidence implies that grade point average is a poor predictor of later vocational achievement.*" Using the results of a statistical meta-analysis approach which combined data from Hoyt's and Nelson's studies, Cohen concluded that "*how well a student does in college relates only marginally with success in a career*" (Cohen, 1984).

Research conducted by Bretz (1989) applied meta-analytic techniques to analyze a set of published research associated with GPA and adult success. Results of this work varied. The results indicated that relative weaknesses found in the study suggest that GPA is not a true indicator for determining career success. Bretz supported these results by noting that college GPA is "simply a measure of academic achievement in classes that the particular student has taken." It is possible that variation in curricula and even within offerings of the same courses introduces sufficient variability in performance measures as to diminish the efficacy of GPA as an objective predictor of cognitive ability.

This study examines the relationship between student academic performance, based on final college grade point average in a two-year turfgrass management program and the success level achieved by graduates at least five years after graduation.

Methods

As background to this study, a twenty question survey, developed by one of the authors, was administered to incoming freshman turfgrass management students at the Ohio State University Agricultural Technical Institute over a seventeen-year period (1995-2011). More than 800 students participated and provided feedback concerning their perception of career success in the turfgrass management industry. Topical criteria utilized to acquire the data focused on four categories: 1) professional industry position attained, 2) salary range or total compensation package in that industry position, 3) personal satisfaction with the position held and 4) what role academic performance (GPA) in college plays in relationship to graduates being successful in their careers. Students identified six career positions as being a measure for attaining success in the turfgrass industry: Director of golf course operations/general manager, golf course superintendent, assistant golf course superintendent, landscape manager/superintendent, business owner in a related field associated with turfgrass management and sales management positions related to turfgrass management. Students identified salary range/ compensation packages based on position acquired with compensation greater than $50,000 considered as successful. The majority of these student respondents indicated that academic performance does impact one's career advancement and success.

This study involved an extensive industry search of alumni (n=347) who graduated between 1997 and 2006. Data was gathered through personal contact (electronic of telephone conversation), personal interviews at state and national turfgrass industry conferences, alumni association records and through professional organization membership directories. Data collected included: professional position job title, salary, personal satisfaction of current position and their employment location (city/state/country). Official university records provided the final GPA and year of graduation for each graduate in the study group. An electronic search was conducted to gather demographic data (U.S. Bureau of Labor Statistics, 2010) related to average individual income associated with the county of residence of each study group individual. Six professional employment positions identified for this study included: golf course superintendents assistant golf course superintendents, directors of golf/golf general managers, associated sales managers, associated business owners and landscape managers. Four other related professional

Table 1. Numbers of study graduates, Average Salary, and Salary Range by position.

Position	Number of Graduates	Satisfied with Job	Average Salary	Salary Range
All Positions	208	194	$56,880	$35,000-100,000
Golf Course Superintendent	110	105	$59,655	$37,000-90,000
Asst. Golf Course Spt.	51	44	$43,275	$35,000-55,000
Directors/General Mgr of Golf	7	7	$79,714	$62,000-100,000
Assoc. Sales Managers	10	10	$62,000	$50,000-80,000
Assoc. Business Owners	15	15	$72,667	$55,000-100,000
Landscape Mgr.	7	6	$53,571	$45,000-75,000
Other	8	8	$52,375	$35,000-65,000

position categories were identified and recorded as other. These employment positions aligned with the six career positions identified by incoming students to be indications of career success as discussed above.

Of the 347 graduates identified 208 (59.8%) hold professional positions in the turfgrass industry. These 208 graduates were used in the analysis detailed below. Table 1 shows the numbers as well as salary information for each of these employment position groups.

To mitigate the effect of local cost of living variations, graduate income was divided by the average personal income for the respective U.S. County in which the graduate resides. Thus, the salary figures used in the statistical analysis are ratios of graduate salary indexed to the average local salary. Total number of people working in the profession based on region was not determined; therefore error of analysis was not determined. Graduates who reported working abroad were not included in the study.

The data were plotted as a scatter plot to provide a visual indication of the relationship between GPA and salary level. Next, the relationship between graduating GPA and indexed salary was analyzed by computation of Pearson's product-moment correlation coefficient and of the critical correlation coefficient at $p = 0.05$ using a two-tailed test for all years and for each year of the study. To investigate whether job satisfaction was a factor that affected the relationship between GPA and salary, a second analysis of the data was conducted for only those people who reported being satisfied with their position and salary. The above statistics were developed for the following groupings of data:

- The data for all 208 graduates.
- All graduates by year.
- The data from all years for graduates who are currently satisfied with their employment position.
- Graduates who are currently satisfied with their employment position by year.

Results and Discussion

The scatter plot for salary level versus GPA data for all 208 graduates is shown in the Figure 1. As can be seen in the scatter plot, GPA and salary are only weakly correlated, if at all, when all graduates are included. Figure 2 shows the scatter plot for normalized salary versus GPA data and also indicates very little or no correlation between the two variables. Correlation coefficients for the all graduates over the entire study period and for each year of the study are shown in Table 2. Correlation coefficients for the all graduates over the entire study period and for each year of the study for students who reports being satisfied with their employment position are shown in Table 3.

Figure 1. Scatter plot of salary of graduates of a 2-year turfgrass program versus their college grade point average. The salary values are for graduates who have been working in the profession for 5 to 15 years.

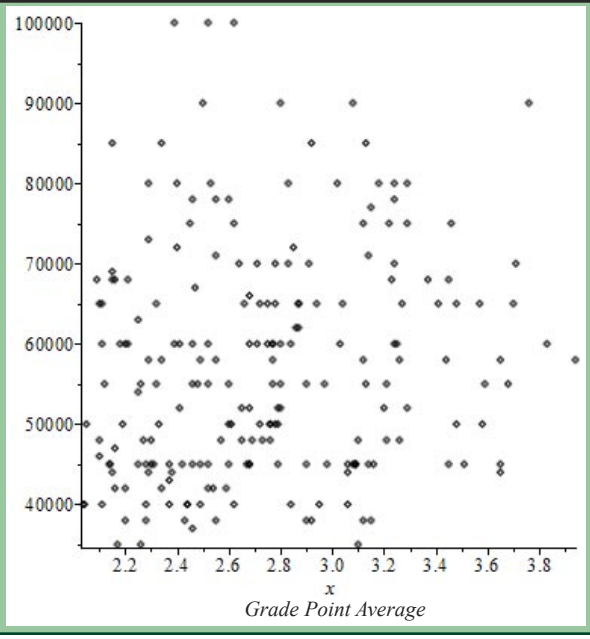

Figure 2. Scatter plot of normalized salary of graduates of a 2-year turfgrass program versus their college grade point average. The salary values are for graduate who have been working in the profession for 5 to 15 years.

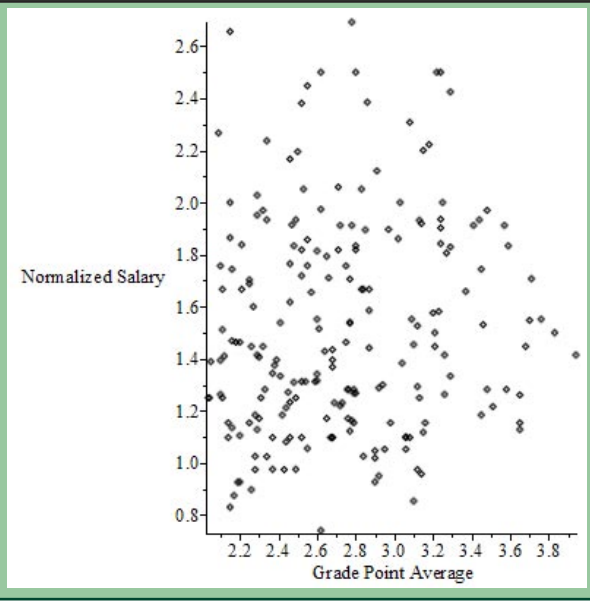

Table 2. Pearson's Product-Moment Correlation Coefficients and critical Correlation Coefficients for all years and for individual years of study, including all graduates.

Year	N	Correlation Coefficient, *r*	*Critical r*, at $p = 0.05$
All Years Combined	208	0.108	0.135
1997	27	0.264	0.368
1998	24	0.027	0.390
1999	22	-0.189	0.406
2000	25	0.333	0.382
2001	21	0.402	0.415
2002	21	-0.024	0.415
2003	18	-0.179	0.447
2004	15	0.229	0.487
2005	21	0.066	0.415
2006	14	-0.209	0.503

Table 3. Pearson's Product-Moment Correlation Coefficients and critical Correlation Coefficients for all years and for individual years of study, including only graduates satisfied with current employment. Years with no unsatisfied students were omitted (shown in Table 2).

Year	N	Correlation Coefficient, *r*	*Critical r*, at $p = 0.05$
All Years Combined	194	0.094	0.140
1997	---	---	---
1998	23	-0.052	0.397
1999	20	-0.167	0.425
2000	21	0.341	0.415
2001	20	0.391	0.425
2002	17	-0.067	0.503
2003	16	-0.277	0.473
2004	---	---	---
2005	---	---	---
2006	---	---	---

Since the scatter plot for normalized salary gave no indication of correlation for the entire data set, correlation coefficients and critical coefficients for the groupings of data were computed to determine the significance of each. No correlation (p = 0.05, two-tailed test) was found between a student's final college GPA and the reported salary when considering all 208 graduates, with a correlation coefficient of 0.108 (critical r = 0.135). Correlations were also determined by year for all graduates within the year and no significant correlations were found (Table 2).

As stated above, to investigate whether job satisfaction was a factor that affected the relationship between GPA and salary, a second analysis of the data was conducted for only those people who reported being satisfied with their position and salary (N = 194). For this data set, the correlation coefficient was 0.0941 (critical r = 0.140), indicating no significant correlation. Also, no significant correlations were found between GPA and salary for graduates who reported being satisfied with their position when analyzed by year (Table 3).

The lack of significant correlation between GPA and salary for the groupings considered implies that higher GPA does not appreciably raise the likelihood of a higher salary. These results have implications pertaining to the requirements of turfgrass occupations as well as the expectations of potential employers in the turfgrass field. The authors find from personal interaction with turfgrass professionals that employers of turfgrass management graduates tend to place a greater emphasis on considering past work experience, employment/college references, college attended and "personality type," rather than grade point average. This could be due to the fact that employers in the turfgrass industry:

- Value candidates with a diverse foundation of knowledge and skill to use in overcoming horticultural and equipment management challenges.
- Value candidates who possess good interpersonal or "people" skills for dealing with customer-related issues.
- Value candidates who possess a positive or "can do" outlook in the face of uncertain circumstances presented by the professional environment.
- Value candidates experienced with sports (eg, golf, field sports) because the turfgrass industry is so closely tied to athletics.

Future studies to elucidate career-success factors among turfgrass graduates will survey the perceptions of graduates who have worked in the industry for at least five years as well as perceptions of employers in the industry. Examples of intrinsic factors that can be yet be investigated include: graduate interest in the turfgrass profession after working in the industry, graduate desire to advance to a more responsible position and graduate perception of his or her worth to the organization. Additionally, an investigation of employer perceptions of attractive employment candidates as well as their perceptions of valuable employees may bring to light some career-success factors not heretofore considered

Summary

Results of this particular study imply that college graduates with higher grade point averages do not tend to achieve higher levels of career success from five to fifteen years after graduation, both in professional positions held and compensation packages earned, than graduates with lower grade point averages in the turfgrass management industry. These results tend to support the findings of other researchers that have suggested that college grade point average is not always a valid and reliable indicator of career success, especially in certain fields of study. Unlike business, law and some medical professions, final college GPA from a two-year degree program does not appear to be a valid predictor of future career success in turfgrass professions.

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Perspectives on the Agricultural and Life Sciences Undergraduate Research Experience at the University of Florida

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Abstract

Although many undergraduate students participate in research, little is known about how their expectations compare to those of faculty overseeing the research. This study explored the attitudes, perceptions and expectations of undergraduate students enrolled in the College of Agricultural and Life Sciences, University of Florida and of faculty supervisors overseeing undergraduate research. Students (n=3,933) and faculty (n=506) were contacted and 317 (8%) students and 81 (16%) faculty members completed questionnaires through SurveyMonkey®. Student responders agreed or strongly agreed that they play an important role in research (60%), are actively engaged (66%), are satisfied with the research experience received (77%), believe the tasks and projects they are assigned showcase their strengths and interests (55%) and are primarily motivated to participate in research due to a genuine interest (65%). Faculty agreed or strongly agreed that they believe the undergraduates feel they play an important role in research (79%), are actively engaged (79%), are satisfied with the research experience received (90%), assign tasks that showcase their students strengths and interests (72%) and are primarily motivated to participate in research due to a genuine interest (54%). In general, faculty had more positive perceptions of undergraduate student research experiences than did the students themselves. Further research is needed to identify specific outcomes for undergraduate research experiences, as well as methods for assessment of these outcomes.

Introduction

Research institutions and the National Science Foundation have long recognized the importance of the involvement of undergraduate students in research (National Science Foundation, 1989). Providing undergraduate students with engaging research experiences is becoming increasingly important as studies suggest participation may increase graduate student enrolment and student achievement (Bauer and Bennett, 2003; Russell, 2008). However, it must be emphasized that once students choose to engage in undergraduate research, they already may have made plans regarding their future involvement in research (Lopatta, 2007). The impact of undergraduate research on student achievement is also less than clear, as it has been reported that participation in undergraduate research is more common for students with higher grades (Russell, 2008). Self-selection and competition for undergraduate research opportunities, particularly those that are funded, may bias studies reporting improved achievement (Taraban and Logue, 2012). As approximately 19% of undergraduate students participate in research (Webber et al, 2013), it may be most important to consider the direct impacts on students such as skill development and enhancement of the undergraduate experience.

Students' perceptions of their undergraduate research experiences have been explored, specifically with respect to learning outcomes and skill gains. Kardash (2000) surveyed undergraduate science students who self-reported their ability to perform 14 research skills before and after participating in a research experience,

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including the ability to formulate a hypothesis, analyze data, orally communicate research results and think critically. Students perceived a significant increase in their ability to perform these skills after completing the research experience and their perceptions of their skill levels were consistent with their mentors' ratings at the end of the research experience. Mabrouk and Peters (2000) surveyed 126 undergraduates majoring in chemistry and biology who had participated in research. These undergraduates reported significant increases in their technical skills and in their problem solving ability. More recently, Lopatto (2007) reported gains in many research-related skills as the result of participating in undergraduate research.

Osborne and Karukstis (2009) summarized that participants in undergraduate research experienced significant personal growth beyond the development of research knowledge and skills. Zydney et al (2002a) surveyed alumni of the University of Delaware's College of Engineering and found that those who participated in undergraduate research perceived the benefit received from the undergraduate experience as "very important" or "extremely important." Similarly, Bauer and Bennett (2003) reported that alumni believed that participation in research was one of the most useful experiences they pursued as undergraduates. Regardless of discipline, undergraduate students should be involved in research experiences that are engaging and involve discovery-based learning methods to promote higher level learning outcomes (Boyer Commission, 1998).

Although an estimated 57% of faculty in American post-secondary institutions supervise undergraduate research activities (Webber et al, 2013), little is known about how their perceptions compare to those of the students participating in the research. Light (2001) provides some insight, suggesting that students and their supervising faculty are in relative agreement on enhancement of analytical and critical thinking skills. In addition, Zyndey (2002b) found that the educational benefits of undergraduate research reported by alumni generally agreed with results of a survey of their science and engineering faculty. Further research is needed to determine if undergraduates involved in research are being offered engaging and academically-enhancing experiences (Boyer Commission, 1998) from both the student and supervising faculty perspectives. The purpose of this study was to explore the attitudes, perceptions and expectations of undergraduate students enrolled in the College of Agricultural and Life Sciences (CALS) at the University of Florida, as well as those of faculty members in the Institute of Food and Agricultural Sciences (IFAS) that supervise undergraduate students involved in research.

Methods

To explore the attitudes, perceptions and expectations of undergraduate students and faculty involved in research, a questionnaire was developed. The questionnaire was initially administered in a pilot study during the fall 2010 semester. Faculty members in the Department of Food Science and Human Nutrition (FSHN) at the University of Florida (n = 5) were contacted and asked to provide a contact list of any undergraduate students currently participating in research activities with them. These students included both volunteers and students receiving course credits. Fifty students were contacted through email and 34 (68.0%) completed a 43-item questionnaire through SurveyMonkey®. As a result of the pilot study, the questionnaire was revised to include demographic items from the CALS student database. In addition, a second questionnaire was developed to target faculty supervising undergraduate research.

During the spring 2012 semester, all students enrolled (n = 3,933) in CALS and all current tenured and tenure-accruing faculty (n = 506) in the Institute of Food and Agricultural Sciences (including CALS) were contacted through email listservs. A link was provided and students and faculty were asked to complete a voluntary questionnaire online through SurveyMonkey®. Students were asked to respond if they were currently involved in or had previously participated in research activities while at the University of Florida. Faculty were asked to respond only if they were currently supervising or had previously supervised undergraduates in research activities. Tenured and tenure-accruing faculty were asked to complete a 46-item questionnaire and students, a 55-item questionnaire. The University of Florida's Institutional Review Board 2 approved the study protocol and all participants provided informed consent online prior to completing the questionnaire. Participants answered questions at their discretion and could quit the questionnaire at any point.

Results and Discussion

The response rate of CALS students was 8.1% and for IFAS faculty, 16.0%. However, it is not known how many students and faculty participate in undergraduate research in CALS and IFAS, respectively, thus the specific response rates of the sub-groups are not known. Webber et al (2013), reporting data from 450 universities, noted that typically 19% of undergraduate students participate in undergraduate research experiences compared to 57% of faculty. If research participation is similar in CALS/IFAS, the response rate is estimated at 44% and 30% for students and faculty, respectively.

IFAS faculty are housed in 18 different academic units and faculty respondents represented 15 of those

units. Faculty in the Department of Animal Sciences had the highest response rate at 13.6% (Table 1). Thirty-five percent of faculty classified themselves as Professor, 37.0% Associate Professor and 28.4% Assistant Professor and almost all respondents (95.0%) reported some percentage of their appointment attributed to research (Table 2). This ratio of participation is similar to that reported by Webber et al (2013), where full, associate and assistant professors were equally likely to supervise undergraduate research.

Table 1. Tenure Department Reported by IFAS Faculty Respondents

Tenure Department	Percent of Respondents	Response Count
Agricultural and Biological Engineering	3.7%	3
Agricultural Education and Communication	4.9%	4
Agronomy	3.7%	3
Animal Sciences	13.6%	11
Entomology and Nematology	8.6%	7
Environmental Horticulture	4.9%	4
Family, Youth and Community Sciences	7.4%	6
Food and Resource Economics	4.9%	4
Food Science and Human Nutrition	8.6%	7
Forest Resources and Conservation	9.9%	8
Horticultural Sciences	9.9%	8
Microbiology and Cell Science	9.9%	8
Natural Resources and Environment	0.0%	0
Plant Pathology	1.2%	1
Soil and Water Science	6.2%	5
Statistics	0.0%	0
Veterinary Medicine	0.0%	0
Wildlife Ecology and Conservation	2.5%	2

Table 2. Demographics of Faculty Respondents

	Percent of Respondents	Response Count
Faculty Classification		
Assistant Professor	28.4%	23
Associate Professor	37.0%	30
Professor	34.6%	28
Current Appointment		
Research	95.0%	76
Teaching	91.3%	73
Extension	57.5%	46
Sex		
Male	59.3%	48
Female	40.7%	33

Sixty percent of students enrolled in CALS during the spring 2012 semester were female, with the largest percentage of students majoring in Food Science and Human Nutrition (18.4%) followed by Biology (15.2%). Sixty-eight percent of respondents who completed the questionnaire were female, with the largest percentage (19.6%) of students majoring in Food Science and Human Nutrition followed by Biology (16.1%). This suggests that the undergraduate respondents were representative of the CALS student body for that semester. This predominance of women is in disagreement with Webber et al (2013) who reported that men more commonly participate in undergraduate research. However, Lopatto (2007) reported that 65% of their respondents were women, suggesting higher participation in undergraduate research by females. Student respondents were primarily upper-classmen, 35.9% were juniors and 43.3% were seniors (Table 3). This finding is similar to Russell (2008), who reported that primarily juniors and seniors were involved in undergraduate research. Similarly, Lopatta (2007) reported that 48% and 34% of the students participating in undergraduate research experiences were entering their third and fourth years, respectively.

Undergraduate Research Commitment and Expectations

Faculty respondents were asked about their experiences and expectations and many (62.5%) reported participating in research activities as undergraduate students themselves. This finding is supported by Russell (2008) who found that faculty engage undergraduates in research because they had participated in undergraduate research and found it valuable.

Students participated in diverse roles during their undergraduate research experiences, assisting faculty in research for course credit, for pay without course credit and as a volunteer without course credit (Table 3). Faculty respondents reported, on average, supervising two undergraduate students for course credit at the time of the questionnaire and expected students to dedicate five hours per week to research activities per credit hour. Faculty also reported supervising, on average, two undergraduate students as volunteers and expected these students to dedicate eight hours per week to research activities. Student respondents, on average, reported that they participated in eight hours per week of research activities and 50.6% had volunteered or worked with their supervisor during two or more semesters; 8.0% reported five or more semesters of research activity. Dolan and Johnson (2010) indicated that one of the less positive outcomes of pursuing undergraduate research was the pressure from graduate students to work long hours. This factor was not studied in the present study.

Attitudes and Perceptions of Undergraduates and Faculty

Students were asked a series of questions about their research experiences and responded using a 6-point Likert scale with responses ranging from strongly disagree to strongly agree. The statements were adjusted in the faculty questionnaire and faculty were asked about their perceptions and beliefs regarding the students' experiences (Table 4). Satisfaction and engagement were areas where faculty and students shared similar perceptions. Undergraduate student respondents agreed or strongly agreed (60.6%) that they maintained a strong relationship with their supervising professor(s). Student

Table 3. Demographics of Undergraduate Respondents

	Percent of Respondents	Response Count
Student Classification		
Freshman	8.3%	26
Sophomore	12.2%	38
Junior	35.9%	112
Senior	43.3%	135
Post-Baccalaureate	0.6%	2
Sex		
Male	31.6%	99
Female	68.4%	214
College where student reported participating in undergraduate research		
College of Agricultural and Life Sciences	71.6%	139
College of Medicine	12.9%	25
College of Liberal Arts and Sciences	10.3%	20
Roles of Students in Research Activities (mark all that apply)		
Assist faculty in research with course credit	39.3%	116
Assist faculty in research for pay without course credit	26.4%	74
Assist faculty in research as a volunteer without course credit	50.9%	147

respondents agreed or strongly agreed that they play an important role in research (59.7%), are actively engaged (66.3%), are satisfied with the research experience received (76.6%), believe the task and projects they are assigned showcase their strengths and interests (54.8%), are motivated to participate in research due to a genuine interest in the research area (64.5%) and to gain experience in the field of study (78.9%). Faculty respondents agreed or strongly agreed that they believe that undergraduate students feel they play an important role in research (79.4%), their students are actively engaged (78.8%), undergraduate students are satisfied with the research experience received (89.9%), they assign tasks that showcase their students strengths and interests (72.2%), undergraduates are primarily motivated to participate in research due to a genuine interest in the research area (54.3%) and that undergraduate students are primarily motivated to participate in research to gain experience in the field of study (71.4%).

The results of the present study are novel as they explore factors that may contribute to enhancement of the undergraduate experience. Previous research has focused on examining the role of faculty as perceived by the student or on outcomes of the experience. For example, Dolan and Johnson (2010), in their case study report, noted that students involved in undergraduate research view their faculty supervisor as "funder", "big picture" and "absolute mentor", whereas their faculty supervisors reported their involvement involved time and effort for funding and mentoring, tension and little recognition. Hunter et al (2006) described perspectives of both students and faculty following a summer undergraduate research experience. Their perspectives were similar with respect to student outcomes such as "thinking and working like a scientist" and "becoming a scientist." However, faculty saw the experiences as a process to socialize the students into the sciences whereas students emphasized personal growth. From the student perspective, the present study supports a goal of undergraduate experience enhancement, perhaps intermingled with skill development.

In the present study, faculty reported more positive perceptions of the undergraduate research experience than did students. Faculty believed their students were more actively engaged than students reported, whereas students reported being more genuinely interested than faculty perceived. These findings confirm the previous findings of Zydney et al (2002a) and Bauer and Bennett (2003) that undergraduate research experiences significantly enhance the undergraduate experience. As not all student respondents reported positive perspectives, the present study provides evidence that the undergraduate experience may not beneficial for all participating students as speculated by Taraban and Logue (2012).

Table 4. Undergraduate and Faculty Attitude and Perceptions

	Strongly Agree or Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel that I play an important role in the research.	59.7%	27.4%	11.7%	1.3%
I believe that my undergraduate research students feel that they play an important role in the research.	79.4%	16.4%	2.7%	1.4%
I am actively engaged in my research activities.	66.3%	24.2%	5.7%	3.8%
My undergraduate research students are actively engaged in their research activities.	78.8%	18.2%	3.0%	0.0%
Overall, I am satisfied with the research activities I have received.	76.6%	17.8%	4.2%	1.4%
I believe that my students feel that, overall, they are satisfied with the research experience that they have received.	89.9%	8.7%	1.4%	0.0%
I feel that the tasks and projects I am assigned by my research supervisor showcase my strengths and interests.	54.8%	30.7%	11.0%	3.5%
The tasks and projects that I have assigned to my undergraduate research students showcase their strengths and interests.	72.2%	25.0%	1.4%	1.4%
I am primarily motivated to participate in research due to a genuine interest in the research area.	64.5%	18.4%	13.2%	3.9%
I believe that my undergraduate research students are primarily motivated to participate in research due to a genuine interest in the research area.	54.3%	28.6%	14.3%	2.9%
I am primarily motivated to participate in research to gain experience in the field of study	78.9%	11.8%	9.2%	0.0%
I believe that my undergraduate research students are primarily motivated to participate in research so they can gain experience in the field of study.	71.4%	17.1%	8.6%	2.9%

Higher Learning Goals

Undergraduate respondents also were motivated to participate in research to aid future career goals; 48.2% had applied or planned to apply to graduate school and 50.2% had applied or planned to apply to a professional school (e.g. medicine, dentistry, pharmacy and veterinary medicine). Undergraduate respondents felt that research experience is important to include on a resume if one is to be a competitive candidate for a professional school (75.3%) or graduate school (82.9%). However, as Lopatto et al (2007) pointed out, it is difficult to discern whether students pursue research to support their goals or whether the research experience directs their goals.

Role of Graduate Students

It is common for graduate students to assist faculty by supervising and assisting undergraduate students involved in research activities. In the present study, faculty respondents frequently (53.2%) reported having graduate students oversee undergraduate students doing research under their supervision. Faculty, on average, had two graduate students supervising and assisting undergraduates. Undergraduate respondents also were also asked about their experiences and perceptions of graduate students when participating in research activities. Students agreed or strongly agreed (80.5%) that working with graduate students enhanced their research experience. Although the present study did not explore the factors contributing to this positive interaction, Dolan and Johnson (2010) noted that graduate students were more approachable than faculty, helpful and served as role models. In addition, they provided insight into the graduate student experience, transition to independent work and exposure to other research.

Areas of Further Analysis and Improvement

There were some areas that suggest a need for improvement or deeper analysis of the research experiences being offered to undergraduates. Some undergraduates (29.7%) reported that the research tasks they completed were monotonous and highly repetitive and 35.3% of students reported studying for other courses during their scheduled laboratory/research time. Some faculty (37.5%) reported that there were times when their students go into the laboratory to participate in research activities and there are no tasks to be completed. Also, some faculty (36.6%) reported that their students sometimes studied for other courses during their scheduled laboratory/research time. Undergraduate students also reported going into the laboratory or scheduled research time and having no tasks to complete (36.0%) and some (30.3%) are currently looking for another undergraduate research position. These findings suggest that although both students and faculty reported that, overall, the undergraduate experience was positive, there is room for improvement to maximize benefits. Webber et al (2013) suggested that the benefits from undergraduate research may reflect the extent of involvement in the research process, or in other words, tasks versus full involvement or more so, labor versus learning.

Summary

The results of this study suggest that, overall, undergraduate students and faculty members share positive perceptions of the undergraduate research experience. Undergraduate students at CALS, University of Florida, reported high levels of satisfaction and engagement with the research experience being provided to them by faculty. Further research is needed to identify specific outcomes of the undergraduate research experience. Institutional outcomes may include retention rate, graduate and professional school acceptance and retention in science fields. In addition, exploration of learning outcomes and the evaluation of these outcomes is needed. Undergraduate students involved in research consist of many pre-professional and aspiring graduate students; the impact of the research experiences in which undergraduate students participate and whether they promote these aspirations or alter their career plans is worthy of study.

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Evaluation of Note Taking Method on Academic Performance in Undergraduate Animal Science Courses

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Abstract

The objective of this study was to evaluate the effect of note taking method on academic performance and attendance in undergraduate animal science courses. During year 1 of the study, students were provided with an outline of material presented in lecture. In year 2, students were provided with a detailed set of notes. Final course grade and attendance data were collected on 814 students. Note taking method data were collected on a subsample of 160 students. Least squares means for final course grades and number of absences were calculated using the mixed procedure of SAS. There was no difference in mean final course grade or mean number of absences between years 1 and 2 for the general population of students. Within the sample group, there was no difference in mean number of absences between the two note taking methods, but a significant difference in mean final course grade existed. Students that were provided with only an outline of the material had a higher ($P<0.05$) mean final course grade (83.70) than students that were provided a detailed set of notes (80.45). Students provided with only an outline of course material performed at a higher level than students that were provided with a detailed set of notes.

Introduction

Many books and articles on how to succeed in college emphasize the importance of taking good lecture notes. Research on note taking indicates that taking notes in class and reviewing those notes has a positive impact on student learning. Students recall more lecture material if they record it in their notes (Bligh, 2000) and students that take notes score higher on both immediate and delayed tests of recall than students that do not take notes (Kiewra et al., 1991). Considering the importance of note taking to student success, it is problematic that student notes are often incomplete and inadequate. Research indicates that students fail to record approximately 40% of the important points in a typical lecture (Hartley and Cameron, 1967; Howe, 1970).

Faculty can employ several practices to help students record higher quality, more accurate notes. These practices include: 1) pacing, 2) pausing, 3) providing visual or verbal cues and 4) providing handouts, outlines, or distributing the instructor's notes (DeZure et al., 2001). This study focused on the last two practices in the list, providing outlines of the lecture material and distributing a copy of the instructor's notes to students. Providing a copy of the instructor's notes does raise a concern about student attendance. If students are provided with a copy of the instructor's notes, then students will have little incentive to attend class. To address this concern, instructors could: 1) make the notes skeletal enough that students still need to be present in class in order for the notes to be useful, 2) provide activities or application of the material in class that cannot be reflected in simple written form, 3) document the importance of attendance on exam performance and convey that information to the students, or 4) simply require class attendance (DeZure et al., 2001).

The objective of this study was to evaluate the effect of note taking method on academic performance and attendance in undergraduate animal science courses after providing students with either outlines of lecture material or a complete detailed set of lecture notes.

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Material and Methods

This study was conducted during the 16-week fall semesters of two consecutive years. During the first year of the study, students were provided with an outline of material presented in lecture. The notes provided required students to attend class in order to record the necessary information to have a complete set of notes. In the second year, students were provided with a detailed set of notes that contained all written material utilized by the instructor. Students were not required to attend class as class attendance was not a component of the students' final course grade. However, the incentive to attend class was to gain further explanation, discussion and application of the material being presented. Final course grade and attendance data were collected on 814 undergraduate students enrolled in animal science courses. Note taking method data were collected on a subsample of 160 students that were enrolled in four upper level animal science courses. All courses were taught by the same instructor, respectively, in years 1 and 2. All graded material was similar within each respective course between the two years. Least squares means for final course grades and number of absences were calculated using the mixed procedure of SAS with means separated using the DIFF option.

Results and Discussion

Analysis of the data revealed that there was no difference in mean final course grade or mean number of absences for the general population of students enrolled in animal science classes between the two years (Table 1). Considering this information, the authors assumed that there was no significant difference in the academic ability or attendance behavior of students between the two years of the study and the differences observed in the test sample were due to the differences in the type of notes provided to the students. In this study, there was no difference in mean number of absences between the two note taking methods. As mentioned previously, there was a concern that providing a detailed set of notes to the students would result in an increase in absenteeism. However, attendance was actually better (numerically) when a detailed set of notes was provided. There was a significant difference in mean final course grade between the note taking methods. Students that were provided with only an outline of the material had a higher ($P<0.05$) mean final course grade (83.70) than students that were provided with a detailed set of notes (80.45). The most likely explanation for this is that students provided with only an outline of the material were forced to record additional information and were more focused on the material being presented. It is important to note that the note taking action itself is part of the memorization process. It is likely that students who had actually written the information in their notes rather than just reading the notes while studying were better able to recall the information during exams resulting in higher exam scores.

Table 1. Least squares means for final course grade and number of absences for the general population of students enrolled in animal science courses and the subsample of students evaluated on note taking method by year and note taking method

	Mean final course grade	Mean number of absences
General population		
Year 1	83.35	3.73
Year 2	83.94	3.01
Note taking method		
Detailed notes	80.45[a]	3.72
Outline of notes	83.70[b]	3.94

[a,b] Means within a column and category without a common superscript differ $P<0.05$)

Summary

The results of this study indicate that students who were provided with only an outline of course material and took a more active role in learning by taking additional notes, performed at a higher level than students that were provided with a detailed set of notes. Both methods were effective and resulted in acceptable final course grades, however, students provided with only an outline of the lecture material had significantly higher final course grades. The authors recommend providing an outline or incomplete set of notes to students to ensure that students are aware of the most important points of the lecture material and to ensure that students take an active role in recording and learning the information. As a result, students should be more able to recall information during exams.

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A Learner-Centered Teaching Model Integrating Undergraduate Research and Service Learning

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Abstract

Learner-centered teaching is an approach that engages students through active learning strategies including service learning, problem solving exercises, collaboration, undergraduate research and capstone experiences. These strategies have been shown to improve critical thinking skills, retention and post-graduate success. This article introduces a successful learner-centered approach to teaching undergraduate nutrition students through an integrated undergraduate research and service learning (UR-SL) project. Students in a sports nutrition course participated as small groups in a semester-long service learning project culminating in a research-based fitness trail proposal. At the end of the project, 63 of the 77 students in the class (82%) completed a brief survey on their project experiences. The majority of students reported their project planning, team building, interpersonal communication and professional proposal skills were enhanced through this experience. On a scale of 1-7 (7=incredibly important), students rated the importance of real-life applications in college coursework as 6.45 ± 0.80 and interacting with a peer team as 5.61 ± 1.38. Students recognized that solving problems in a group is an effective way to learn and that group decisions are often better than individual decisions. The majority (93%) of students participating in this learner-centered project recommend this UR-SL activity to their peers.

Introduction

A learner-centered teaching approach engages students through active learning strategies including service learning (SL), problem solving exercises, collaboration, undergraduate research (UR) and capstone experiences (Wright, 2011). These high impact experiences enhance academic and personal growth, career development and a wide variety of desired learning outcomes (Kelly, 2011). In addition, learner-centered techniques teach students how to think, solve problems, evaluate evidence, analyze arguments and generate hypotheses (Weimer, 2012). These are all skills necessary to master discipline-specific content.

Numerous examples from multiple disciplines, including those in colleges of agriculture, support learner-centered approaches to teaching at all levels of education. In elementary schools, students enrolled in classrooms engaging in scientific practices through a student-centered approach showed enhanced learning when compared to those in traditional classrooms (Granger, 2012). Pharmacy students reported increased motivation and enhanced ability to learn material and obtain a desired course grade when enrolled in a pharmacotherapy course using a learner-centered approach (Cheang, 2009).

Learner-centered teaching encourages collaboration and building a community of learners (Weimer, 2012). Such collaboration is particularly important for dietetics

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and human nutrition students who often work in interdisciplinary healthcare teams. Inter-professional relationship skills can be enhanced through innovative and targeted undergraduate student experiences, such as interdisciplinary communication and ethics coursework (Whelan et al., 2005). Small group work often facilitates interdisciplinary relationships and collaboration.

Service Learning

Service learning promotes student learning through a mutually-beneficial activity that relates a community service activity to course or program learning activities (Anderson et al., 2011). Such activities build strong community and campus relationships while enhancing student learning and skill sets (Ross, 2012). Service learning is a well-recognized teaching approach across a wide variety of disciplines, including landscape design (Hansen, 2012), pharmacy (Falter et al., 2011; Kearney, 2008) and human nutrition and dietetics (Stephenson, 2012). Colleges of agriculture are leading efforts to develop and offer well-designed SL projects.

Educators must distinguish between SL and community service activities. While both are of value to students, SL applies course content and results in a deliverable outcome, such as a community proposal. In addition, successful SL activities force students to reflect on and generalize about their learning (Estepp and Roberts, 2011). Self-reflection fosters critical thinking skills, relates the SL activity to a student's future career and provides a means for students to communicate feelings about the educational and emotional aspect of a project (Ash, 2003; Bonnette, 2006). Students engaged in meaningful SL followed by thoughtful reflection are more committed to lifelong civic engagement and personal growth (Ash, 2003).

Undergraduate Research

Undergraduate research experiences attract students to the sciences, providing a strong foundation for professional development and personal growth (Villarejo, 2008). According to Lopatto (2003), UR enhances professional credentials, clarifies career paths, facilitates learning, promotes a continuing relationship with faculty, introduces students to obstacles faced in the research process and teaches students how professionals work on real problems. Students engaged in UR have a more sophisticated understanding of the process of scientific research, particularly if the UR experience is multi-year (Thirty, 2012).

How a college, course, or professor engages students in undergraduate research significantly influences the degree of project ownership expressed by students (Hanauer, 2012). Undergraduate research takes on many forms in higher education. For example, at the course level student-centered course activities can foster the delivery of high-quality research designs while engaging students to become self-directed and critical thinkers (Wiegant, 2011). On a smaller scale, faculty may be mentoring an individual student or small group of students. Six students in agronomy, soils and environmental sciences at Virginia Tech were carefully shepherded through the research experience, culminating with presentation of their results at a professional meeting (Galbraith, 2012). The students reported value to this high-engagement research activity and would recommend the activity to their peers and to faculty mentors.

Undergraduate research is particularly of value to those in the health industry, who are taught evidence-based practice skills. Through research-based coursework, students in nursing and related disciplines learn to integrate previously fragmented research knowledge to understand the relevance of research evidence for providing patient care (Meeker et al., 2008). This ultimately makes these students better practitioners (McCurry and Martins, 2010). A constant challenge for faculty is developing course assignments that engage students in research-based coursework, while teaching concepts necessary for understanding and appraisal (Balakas and Sparks, 2010).

Faculty may express concern over an undergraduate student's preparation to participate in meaningful research as well as the time required for quality mentoring (Coker and Davies, 2006). However, evidence suggests that the majority of undergraduate students do have the skills and capacity to conduct innovative and important research studies (Wiegant, 2011). For time efficient mentoring, faculty should allow the student to brainstorm, hypothesize and perhaps make mistakes before intervening.

Integrating Undergraduate Research and Service Learning

Examples of courses that integrate research and SL are limited and often restricted to graduate-level programs and healthcare-based disciplines. However, evidence from such programs suggests that they both increase understanding of the research process and acquaint students with a community-based issue or goal (Balakas and Sparks 2010; Bouhaimed et al., 2008; Collier, 2012). One example is from third-year nursing students who worked in small groups under the guidance of a nursing instructor to answer clinical questions posed by practice-based community partners (Janke et al., 2012). Through this experience, students developed information literacy skills while also serving the needs of their community. Medical students at the

University of Texas Southwestern Medical Center had the opportunity to participate in a 9-week summer research training program with a community-based focus (DeHaven and Chen, 2005). Faculty reported that the program accomplished its objectives of increasing students' research knowledge and their awareness of community health needs.

The professional organization for dietetics and human nutrition, the Academy of Nutrition and Dietetics (formerly the American Dietetic Association), supports research as the foundation of dietetics practice (Myers et al., 2003). According to the Academy, research is the basis for education, strengthening and sustaining the knowledge base of the profession and setting public policy (Manore and Myers, 2003). Graduates of accredited dietetics programs are expected to have a basic knowledge of research methodologies, needs assessments and outcomes-based research and a working knowledge of the scientific method and quality improvement method (Vaughn, 2003).

The goal of this project was to provide undergraduate human nutrition and dietetics students with a meaningful undergraduate research experience integrated with a community-based SL project. The student perceived value of learner-centered teaching and group collaboration in an integrated undergraduate research and service learning (UR-SL) project was assessed through an end-of-semester survey.

Methods

Course Description

The first author teaches the course "Sports Nutrition" to sophomore, junior and senior level dietetics and human nutrition students at the University of Kentucky (Lexington, Kentucky). The course is required for human nutrition and optional for dietetics students. The pre-requisite for the course is Introductory Nutrition, a course most often taken by sophomores following completion of pre-major biology and chemistry requirements. Sports Nutrition is a terminal course that can be taken at any point following Introductory Nutrition and prior to graduation. The course is taught as a hybrid course, meeting once per week in-class and supplemented with online activities, real-life case studies and projects. Enrollment in the course is limited for optimal course management, quality assessment and reflection on assignments and instructor-student interaction. Student instruction is enhanced through a course packet and weekly out-of-class graded textbook reading assignments. An UR-SL project called the Legacy Trail Project was integrated as a semester-long project during the spring 2012 semester.

The Legacy Trail Project

The Legacy Trail opened in Lexington, KY in 2010 to provide a safe place for the community to exercise. With four access points, including two located on off-campus UK College of Agriculture land, the 8.5 mile paved trail offers an enjoyable venue for individuals and families to get active. The Legacy Trail Project was a collaboration between students and faculty in dietetics and human nutrition and the University Built Environment Committee to assess trail usage and user opinion about the trail for future trail development and marketing. The project was conducted in three stages: observation, survey conduction and proposal development. Incorporating SL into each of the stages was critical to the projected learning outcome of the project. All activities that involved the Legacy Trail Project were approved by the University of Kentucky Institutional Review Board.

Stage 1 entailed student acclimation to the Legacy Trail and observation of trails users during February and early March. Working in groups of two, students monitored trail use for one-hour periods at the four trail access points. For many students, this was their first time out on the trail and students were encouraged to explore the trail. The students completed a short form that allowed tracking of the date and time that the group was observing as well as the access point where the group was located, a general weather description, temperature and most importantly the gender and the physical activity of each user of the trail. Results of the early spring surveys were utilized in determining Stage 2 surveying days of the week and time of day.

Stage 2 consisted of surveying the users of the Legacy Trail. Supervised by faculty or staff, students gathered at different access points at times determined by the previous observation stage to ensure that surveys were conducted at peak usage times. The students interviewed users upon arrival or departure from the trail or if a user was moving at a pace that made them accessible. The faculty-developed survey contained 17 questions that were used to determine how the trail was used and what improvements could be made. Specifically, users were asked if they would use fitness equipment or read health tips posted on signs along the trail. Each interview took approximately five minutes to complete. Data from 136 trail users was collected and analyzed.

The last stage of the Legacy Trail Project was development of an evidence-based trail proposal, which provided students with an opportunity to reflect upon the information gathered from the surveys in addition to their own experiences out on the trail. Each group was asked to develop a full proposal for improvement and expansion of the Legacy Trail to include outdoor

fitness equipment. Students were randomly assigned budgets ranging from $25,000 to $100,000 and given information regarding possible equipment choices. All groups were asked to account for 25% of the given budget for any installation and maintenance costs to simulate true budgeting. The groups turned in a proposal that included the goals and objectives for the project, a map of the Legacy Trail demonstrating where the proposed improvements would be made, a description and justification for all improvements and lastly the budget. Proposals were submitted to the Built Environment Committee who utilized the proposals and collected data in project presentations for the Lexington Fayette County Urban Government and the Bluegrass Community Foundation. Both organizations have used this information in future community development and trail planning. There are also plans to continue surveying trail users at the Legacy Trail, but also at other fitness trails in the community.

Student Evaluation

Student perception of the UR-SL project was assessed in a two-page written survey at the end of the spring 2012 semester. Anonymous surveys were distributed to all students enrolled in the sports nutrition course. Sixty three surveys were completed and returned, an 82% response rate. The committee-developed survey evaluated students' perceptions of the UR-SL project. The quantitative component of the survey assessed student interest in the project, skills enhanced and the value of working in a peer team. Qualitative questions evaluated knowledge gained and most and least favorite aspects of the UR-SL project. This study was deemed exempt by the University of Kentucky Institutional Review Board.

Results and Discussion

Students representing three different academic classes completed this project - sophomore (40%), junior (11%) and senior (49%). Eighty percent of the students were human nutrition students taking the course as a major requirement and 20% were dietetics students taking the course as an optional elective. Sports nutrition is a growing field making the course a sought-after elective course for dietetics students. Consistent with the overall demographics of students in the human nutrition and dietetics majors, the majority of participants (73%) were female.

One-third of the students reported that this was the first college course they had taken that had real-life, student-centered learning, activities. Thirty-two percent of students had taken one course, 21% two courses and 14% three or more courses, that had real-life applications. These results are consistent with national averages of students participating in such learning opportunities only once or twice in their college careers (Kelly, 2011).

On a Likert-like scale of 1-7 (7=incredibly important), students rated the importance of real-life applications in their college coursework as a 6.45 ± 0.80. Others have also found that students value working with a community partner to learn course content as a meaningful experience (Balakas and Sparks, 2010; Holston and O'Neil, 2008). Many medical schools are now training physicians through innovative teaching techniques, including community-based research addressing the needs of the underserved through community partnerships (DeHaven et al. 2011).

Students were asked to rate their overall interest in the project at the beginning and end of the semester using a Likert-like scale of 1-7 (Table 1). Student interest in the project was enhanced ($p<0.05$) during the course of the semester. Ninety-three percent of students would recommend this, or a similar, UR-SL project to their peers.

Table 1. Students overall interest in the UR-SL project at the beginning and end of the semester (n=67).

Interest Rating	Average ± SD
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe project at the beginning of the semester?	4.61 ± 1.56
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe project at the end of the semester?	5.16 ± 1.39 *

The results of the skills enhanced questions are presented in Table 2. Overall, the majority of students reported enhancement in each of the skills. Thirty-eight percent of surveyed students reported that all six of these skills were enhanced. The greatest enhancement in skills was for project-specific knowledge related to fitness trails and the Legacy Trail itself. The majority of students were unfamiliar with the Legacy Trail at the beginning of the semester. Based on student feedback on skills enhanced, in future UR-SL projects we recommend placing more emphasis on interpersonal communication skills, both within the dynamics of a team as well as during trail user surveying. Only two-thirds of students felt this skill was enhanced through the Legacy Trail Project.

Table 2. Student-reported enhancement of skills through the UR-SL project (n=67).

Skill	Percentage Responding Skill Was Enhanced
Knowledge of the location and layout of the Legacy Trail in Kentucky	92%
Project planning on a fixed budget	87%
Knowledge of the roles of fitness trails in community development	85%
Team building	68%
Preparation of a professional project proposal	65%
Interpersonal communication skills	63%

Table 3. Student reported attitudes about working with a team in the UR-SL project (n=67).

Rate the following about working with a team on this project.	Average ± SD (Scale of 1-7, 1=completely disagree, 7=completely agree)
The ability to work with my peers is a valuable skill set.	6.53 ± 0.65
The ability to collaborate with my peers will be necessary if I am to be successful as a student.	6.23 ± 1.05
I have a positive attitude about working with my peers.	6.16 ± 1.01
Solving problems in groups is an effective way to learn.	6.12 ± 0.89
Group decisions are often better than individual decisions.	5.28 ± 1.46

Students recognized the importance and value of team work in a large-scale research project and proposal. Working in groups of 6-7, students completed all aspects of the project as a team. Student attitudes towards team work are shown in Table 3.On a Likert-like scale of 1-7 (7=completely agree), students rated "The ability to work with my peers is a valuable skill" as a 6.53 ± 0.65. Sixty percent of students completely agreed (score=7) with this statement. Students also recognized the value of group problem solving to enhance learning (6.12 ± 0.89). While the majority of students reported a positive attitude towards group work, 7% of students scored this statement at or below 4 (7= completely agree).

These results mirror what we and others have found related to group work; the majority of students appreciate group learning, but not all (Stephenson et al., 2012). Three of four pharmacy students reported working with other students on a patient case study reinforced the material more than completing case studies independently (Cheang, 2009). Group size is an important factor to consider. While our UR-SL project teamed students in groups of 6 or 7, ideal team size has been found to be 3 or 4 students (Holston and O'Neil, 2008). If we completed this project again we would strive for the smaller group sizes. One issue with smaller groups is the need for additional course management due to the larger number of groups to monitor and mentor.

Students were asked to identify their "favorite" and "least favorite" aspect of the UR-SL project. Over 60% of students provided open-ended responses indicating their favorite aspect of the project was learning about and visiting the Legacy Trail. Students favorably reflected that going to an off-campus trail was a positive experience. Many students responded that they enjoyed walking the trail with their teams and doing something "different."

For 19% of the students, their favorite part of the project was surveying Legacy Trail users. Interestingly, 21% of the students described the surveying as their least favorite aspect of the project. It was evident during the surveying that some students felt much more comfortable with surveying the trail users than others. While students were trained and supported at all times by project faculty or staff, personality differences between the students showed through in this aspect of the project. Eleven students did not like surveying strangers and felt they were interrupting the individual's workout. Although the surveying took some students out of their comfort zone, student participation in subject recruitment and collection of data are important and necessary skills to enhance a student's understanding and appreciation of the research process (Vaughn, 2003). For our project students were assigned to work in pairs, attempting to match students based on interviewing experience and confidence.

Students were also split on their open-ended responses towards working in a team. Ten percent of students described this as their favorite and 12% as their least favorite aspect of the project. For those students who rated group work as their least favorite part of the project, the majority (7 of 8) provided statements directly related to the challenges of coordinating schedules with group members. Only one student provided an open-ended response of simply not enjoying working in a group. A separate student reported enjoying "Working with select members from my group."

These results are consistent with what others have identified as strengths and challenges of group work.

Summary

College teachers do not just teach content, they teach students how to become critical thinkers and contributing members of society (Doyle, 2012). Learner-centered teaching benefits not only students, but increases job satisfaction for teachers (Wright, 2011). While a well-recognized teaching technique, most college professors are hired for their expertise in a discipline, not in teaching. Professors benefit from guidance and hands-on assistance in developing learner-centered courses and activities. Estepp et al. (2012) provide college of agriculture instructors with such an experiential learning model, detailing three key stages - planning, delivery and evaluation.

Our project and student feedback validate the merit of a SL project that integrates UR. Human nutrition and dietetics students learned the value of research in developing evidence-based proposals. If the students had developed a Legacy Trail proposal without first seeking the input of the fitness trail users, their proposals would have been significantly different and mis-represented the needs and desires of the trail users. For example, through surveying the students learned that trail users are less interested in fitness equipment and more interested in better trail signage (e.g. finding the trail and mile

markers), more restrooms, water fountains and benches. Many of the trail users were training for endurance events, such as half or full marathons and would not stop during their run to use the fitness equipment. Trail users also suggested adding a playground area to one or more of the trail entrance points for family-friendly activities.

Evidence-based, learner-centered, models for teaching are shaping the education of students (Smith-Strom and Nortvedt, 2008). The Legacy Trail Project provided college of agriculture students with an opportunity to engage in UR while having a positive impact on their community. This community partnership also opened the doors for a second UR-SL project related to the Legacy Trail as well as the UK Arboretum, which includes a 2-mile paved fitness trail.

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Class Attendance: An Investigation of Why Undergraduates Choose to Not Attend Class

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Abstract

Limited research is available on the reasons undergraduate students choose to not attend class, especially literature focused on students in agriculture and natural resources. This study examines this issue by surveying undergraduate students on potential reasons to not attend class. A majority of the students agreed upon 23 reasons for not attending class and those reasons were related to personal issues, class structure, instructor behavior and issues, student performance and class scheduling. The number one reason was attendance is not taken in the class.

Introduction

American society and the U.S. government place great importance on higher education because of individual and societal benefits that are associated with higher education (Ishitani, 2006). This commitment and belief in higher education is demonstrated through our societal and government investments (Ishitani, 2006) and the plethora of research investigating attrition in higher education (Bean, 1982; Braxton et al., 1988a; Braxton et al., 1988b; Chen and DesJardins, 2010; Gilardi and Guglielmetti, 2011; Ishitani, 2003, 2006; Ishitani and DesJardins, 2002; Iwai and Churchill, 1982; James, 1988; Jones et al., 2010; Mallette and Cabrera, 1991; Metzner and Bean, 1987; Nunez and Cuccaro-Alamin, 1998; Pascarella and Chapman, 1983; Pascarella et al., 1983; Pascarella and Terenzini, 1978, 1980, 1983; Stage, 1988; Stage and Hossler, 1989; Stampen and Cabrera, 1986, 1988). The aforementioned attrition studies have examined variables such as undergraduate research, student background characteristics (e.g., gender, race and ethnicity, high school academic achievement and parents' educational attainment), community college, institutional characteristics, engagement styles and financial aid with the broad goal of decreasing attrition or increasing degree completion. Moreover, it seems almost unnecessary to say, but another important aspect of decreasing attrition and obtaining a college degree is probably class attendance and fewer inquiries have sought to understand why undergraduate students choose to not attend a given class.

Friedman et al. (2001) stated "class attendance is a puzzle" (p. 124) and undergraduates choosing to not attend class appears to be a growing trend (Massingham and Herrington, 2006). Investigations into class attendance rates have reported on any given day 20-40% of undergraduate students are electing to not attend class (Friedman et al., 2001; Romer, 1993; University of Florida, 2009). This is troubling and should be of concern for administrators and faculty since numerous studies have shown that not attending class has a negative effect on class success (Chen and Lin, 2008; Clump et al., 2003; Devadoss and Foltz, 1996; Dobkin et al., 2007; Gump, 2005; Marburger, 2001; Marburger, 2006; Massingham and Herrington, 2006; Rodgers, 2001; Romer, 1993)

In addition to affecting a student's educational success, Wyatt (1992) stated when students skip class this behavior negatively affects faculty morale and Devadoss and Foltz (1996) suggested absenteeism also negatively affects the students who attend class and the overall teaching-learning environment (Devadoss and

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Foltz, 1996). Correspondingly, Westrick et al. (2009) reported the consequences of absenteeism are more far reaching than students' academic performance and disruptions in the classroom. Students who frequently miss class often do not recognize that the classroom is a community to which they belong and that when they are absent, learning declines, student and teacher morale decreases and academic standards are compromised. (p. 1) Furthermore, Westrick et al. noted faculty-student interactions and the observation of faculty are crucial elements of the professional socialization process of college students.

Determining specific reasons for why undergraduate students are choosing to not attend class may generate valuable information for administrators and faculty that could be used to improve class attendance, thus improving the learning environment and student success. This research might also help to reduce attrition in higher education. This study will examine the issue of absenteeism by investigating the reasons why undergraduates in the College of Agricultural and Life Sciences at the University of Florida are choosing to not attend class.

Theoretical Framework and Literature Review

The theoretical bases for this study are Maslow's (1970) hierarchy of basic needs and Atkinson's (1957) expectancy-value theory of achievement motivation. The aforementioned theoretical bases allow the researchers to address the reasons for not attending class in a holistic manner. Maslow (1970) posited that there is a hierarchy of five basic needs that affect motivation: (a) physiological, (b) safety, (c) belongingness and love, (d) esteem and (e) self-actualization. Additionally, "*Maslow (1968, 1970) believed human actions are unified by being directed toward goal attainment*" (Schunk, 1999, p. 308). This theory is most often thought of as a fixed order of needs, but Maslow (1970) suggested that the hierarchy "is not nearly so rigid" (p. 51) and gave several example of exceptions. "*A more realistic description of the hierarchy would be in terms of decreasing percentages of satisfaction as we go up the hierarchy of prepotency*" (Maslow, 1970, p. 54). Atkinson's (1957) expectancy-value theory of achievement motivation postulated, the strength of motivation to perform some act is assumed to be a multiplicative function of the strength of the motive, the expectancy (subjective probability) that the act will have as a consequence the attainment of an incentive and the value of the incentive: Motivation = f (Motive X Expectancy X Incentive). (pp. 360-361)

Hence, expectancy-value theory of achievement motivation suggests, "behavior depends on how much individuals value a particular outcome (goal, reinforcer) and the expectations of attaining that outcome as a result of performing given behaviors" (Schunk, 1999, p. 314). In an educational setting, Maslow's (1970) hierarchy of basic needs and Atkinson's (1957) expectancy-value theory of achievement motivation may provide motivational reason for not attending class and generate valuable information that could be used to increase attendance, thus improving student performance.

Class Attendance and Performance

A review of the literature indicated class attendance decreases as the academic term progresses (Marburger, 2001; Rodgers, 2001; Van Blerkom, 1992, Zhao and Stinson, 2005) and the reasons for this decline in attendance have only been hypothesized. Most of the research done to determine if attendance has an effect on class performance has been conducted in the area of economics education. Rodgers (2001) found in a study of 200 business and economic students that attendance had a significant effect on performance. Students who had average attendance scored between 1.3 and 3.4% lower than students with perfect attendance. The average attendance was 68% with the percentage of students attending class being higher in the first half of the semester compared to the second half of the semester. Marburger (2001) found absences increase by 9% on Friday as compared to Monday and Wednesday and that "*overall, absenteeism increased the probability that the average student would respond incorrectly to the average exam question by 14.6% on the first exam, 14.4% on the second exam and 7.5% on the third exam*" (p. 105). According to Marburger (2006), absent students were 9% to 14% more likely to respond incorrectly to course content covered in their absence than were students who were present. Dobkin et al. (2007) reported in three large economic classes:

A 10 percentage point increase in the pre-midterm attendance rate is associated with a 0.13 standard deviation increase in the midterm score. Similarly, a 10 percentage point increase in the total course attendance rate is associated with a 0.15 standard deviation increase in the final exam. (p. 11)

Romer (1993) found a significant relationship between attendance and performance in an intermediate macroeconomics course. A student that only attended a quarter of the lectures earned a C– compared to a B+ for students who attended all of the lectures. Furthermore, attendance alone accounted for 31% of the variance in performance. Romer also found at three elite universities/colleges that absences in economic classes were about one third on a typical day. Zhao and Stinson (2005) divided two macroeconomics sections into four

consecutive three and a half week time periods and found on average students missed 16.57, 18.57, 21.14 and 21.71% of classes. "*A typical student, who missed 2.4 weeks throughout the semester, could earn 4.3 points more if he/she were not absent from any class*" (Zhao and Stinson, 2005, p. 5). Massingham and Herrington (2006) stated "*students who attended lectures and tutorials had a better chance of success on all assessments in particular the final exam*" (p. 97). Chen and Lin (2008) reported attendance had a significant impact on class performance and the more a student attended class, the greater the positive effect of attending. A study of agricultural economics students by Devadoss and Foltz (1996) found attendance rates that were higher (89%) than Romer (1993) and Rodgers (2001) (67 and 68%) and suggested the difference may be due to the fact class sizes were smaller and were comprised of students specializing in agricultural economics. However, they too reported a significant relationship exists between attendance and class performance.

The research done in areas outside of economics is limited, but similar results have been found. In Adolescent Development and Introduction to Educational Psychology classes, Van Blerkom (1996) found a "*significant correlation between class attendance and final grade in the courses, $r = .46$, $p < .001$*" (p. 5). Van Blerkom (1992) found attendance in undergraduate psychology courses steadily declined during the semester and class attendance correlated significantly with course grades. These findings are consistent with studies of economic students (Marburger, 2001; Rodgers, 2001; Zhao and Stinson, 2005). Gump (2005) studied 300 undergraduates in an Introduction of Japanese Culture course and reported a significant strong negative correlation between absences and final grades for each of the four semesters of data collection. Seniors were found to have the most absences and second lowest average of final grades. Sophomores had the least absences and the highest average of final grades. Gump (2004) also looked at students from an Introduction of Japanese Culture course and found that students with a B+ average or higher had 0.5 absences (SD = 0.7) compared to 1.4 absences (SD = 1.5) for students that had an average below a B+. Gump (2006), a study of 172 undergraduates, reported a positive relationship between the importance students attributed to attendance and their attendance rates.

Reasons for Not Attending Class

Limited research is available that seeks to determine the reasons why undergraduate students choose to miss class. Van Blerkom (1992) reported students in 17 sections of undergraduate psychology classes gave the following reasons for being absent:

(a) the need to complete an assignment or extra credit project or to study for another course
(b) the class was boring
(c) severe illness such as the flu
(d) minor illness such as a headache, cold, or sore throat
(e) too tired to go to class because of active social life
(f) oversleeping. (p. 491)

Friedman et al. (2001) asked 50 undergraduates to provide a reason for not attending each course that they were currently taking. After eliminating duplicates, 33 reasons were produced and were categorized into the following categories: (a) unavoidable inability to be present, (b) choice of other school activities, (c) choice of other non-school-related activities, (d) irresponsible leisure pursuits, (e) avoiding anticipated class experiences and (f) lack of incentive. In the same study, Friedman et al. reported a survey of 333 students enrolled in multiple sections of a social science course revealed that the most common reasons for being absent were (a) being sick (38.1%), (b) being tired or overslept because of completing schoolwork the night before (32.5%), (c) being tired or overslept because of fun the night before (32.0%), (d) personal task (22.0%), (e) attendance is not taken or does not influence my grade (21.6%), (f) wanted to take a break during the time class was meeting (20.7%) and (g) out of town or on my way out of (or back to) town (20.1%). A survey used by Gump (2004) gave students six rationales for missing class (weather, health, preparedness, preoccupation, inconvenience and personal choice). The students were asked to choose all options that applied to their absences or potential absences.

The most common rationale chosen for missing class was health (84%) followed by preoccupation (66%), weather (42%), personal choice (26%), inconvenience (16%) and preparedness (8%). A focus group of 33 pharmacy students gave the following reasons most often for not attending class: "*class is before or after test, faculty read their notes, personal logistics and 2 or more hour breaks before or after class.*" (Fjortoft, 2005, p. 110). Massingham and Herrington (2006) stated:

University students include as their main reasons for not attending lectures and tutorials as being: busy, sick, at work, bored, having technology alternatives (eduStream) and the teacher. When there are no health and lifestyle factors involved, the most important influence on attendance is student attitudes to learning and motivation, such as "the topic was boring" and "I don't like the subject." (p. 96)

Westrick et al. (2009) reported that the top five main reasons for a pharmacy student not attending class was

(a) being sick, (b) tired or overslept because of studying the night before, (c) working on an assignment or studying for a test, (d) attendance is not taken or does not influence grade and (e) course content is available from another source.

Health/illness, course content being available from another source, need to complete an assignment or study for a test, being tired, oversleeping, attendance is not taken, class or topic is boring and preoccupation/busy are commonalities in the literature on reasons to not attend class.

Purpose and Objectives

The purpose of this study was to examine an entire college with 21 undergraduate majors and more than 50 specializations at a large land-grant university to add to the limited research of specific reasons why undergraduate students elect to not attend class. The objectives that framed this study were as follows:

1. Identify the top 10 reasons why undergraduate students in the College of Agricultural and Life Sciences at the University of Florida do not attend a given class.
2. Determine if attendance in the College of Agricultural and Life Sciences at the University of Florida is influenced by (a) class size, (b) class scheduling, (c) class structure, (d) course classification (e) instructor behaviors and issues, (f) student performance, (g) personal issues and (h) learning activities.
3. Compare top 10 reasons for not attending class based on student attendance.

Methodology

Research Design, Population and Sample

The research design was descriptive survey research. The target population of this study (N = 3781) was all undergraduates in the College of Agricultural and Life Sciences at the University of Florida. The sample was a convenience sample of 785 students in the College of Agricultural and Life Sciences at the University of Florida, which consisted of 21% of the target population. Participants self-reported gender, age, class level, major, ethnicity, when they were admitted to the university, grade point average and the number of times students did not attend class during the past four weeks. The sample consisted of 197 males and 588 females. The average age of the sample was almost 22 years old (M = 21.95, SD = 4.88) with a range of 17 to 61 years old and a mode of 21. The class level of the sample was 13.4% freshman, 13.5% sophomores, 31.3% juniors and 41.9% seniors. Their mean grade point average was 3.37 (SD = 0.46) on a four point scale and 64.3% were admitted as freshman while the remaining 35.7% were transfer students.

The participants described their ethnicity as the following: 0.05% American Indian or Alaska Native, 5.1% as Asian, 5.4% as Black or African American, 1.1% as Native Hawaiian or other Pacific Islander, 76.1% as white and 11.2 % as other. Additionally, all majors within the College of Agricultural and Life Sciences at University of Florida were represented and the students reported that they were absent from class-sessions approximately four times (M = 4.06, SD = 4.64) during the four weeks prior to taking the survey.

Demographic information was obtained from the College of Agricultural and Life Sciences and the sample was found to be representative of the target population on all demographic variables except for gender. As a result, the data were weighted according to Biemer and Christ (2008) to create a sample that was representative of the target population in regard to gender. After the data was weighted based on gender, the data was compared to the target population again and the sample was determined to be representative of the target population on all demographic variables.

Instrumentation

The survey used in this study was developed in four phases. First, the researchers searched the class attendance literature to develop a list of potential reasons why students would choose to not attend class. Secondly, the researchers added potential reasons to the aforementioned list based on Maslow's (1970) hierarchy of basic needs and Atkinson's (1957) expectancy-value theory of achievement motivation. Thirdly, the researchers visited a large lecture course of approximately 150 students in the College of Agricultural and Life Sciences at the University of Florida. The students in the lecture course were given the list of potential reasons developed in the first two phases and were asked to delete reasons they felt were not appropriate and add reasons that were not represented on the list. In the fourth and final phase, the researchers met to discuss and evaluate the reasons deleted and added from the list by the students of the large lecture course.

A consensus was reached among the researchers and that list became the items for the class attendance survey. The survey focused on the statement, "I am likely to not attend class when…" with a Likert scale of 1 to 5 where 1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree and 5 = strongly agree. Furthermore, prior to data analysis, the researchers clustered the survey items into the following categories:

(a) class size, (b) class scheduling, (c) class structure, (d) course classification (e) instructor behaviors and issues, (f) student performance, (g) personal issues and (h) learning activities.

Data Collection

Data were collected during the last five weeks of the fall 2010 semester at the University of Florida online using the Qualtrics Survey software. Dillman et al. (2009) web survey implementation procedures guided the methods used to obtain responses from the target population and multiple contacts were used. Four emails were sent approximately one week apart to the entire target population (N = 3781): (a) prenotice, (b) email with a link to the survey, (c) reminder email with a link to the survey and (d) final email with a link to the survey. The undergraduate students in this study volunteered to participate and take the online survey by digitally signing an informed consent that was approved by the University of Florida's Institutional Review Board. The survey took approximately 15 to 20 minutes to complete.

Data Analysis

Descriptive statistics were used to analyze the data and percentages were reported. The researchers combined the strongly disagree and disagree response categories to obtain disagreement percentages and the agree and strongly agree response categories to obtain agreement percentages. To address the issue of missing values in the dataset due to item nonresponse, the multiple imputation procedure was used in the Statistical Analysis System (SAS), as described by Yuan (2000). Multiple imputation (IM) is one of the recommended methods used by statisticians to address the problem of attrition due to list-wise deletion of observations with one or more missing values in multivariate analyses (see Schafer and Graham, 2002).

Furthermore, the terminology proposed by Davis (1971) was used to describe the magnitude of the associations between reasons students were likely to miss class and the number of class sessions absent the four weeks prior to completing the survey. To that end, correlations from .01 to .09 are negligible, .10 to .29 are low, .30 to .49 are moderate, .50 to .69 are substantial, .70 to .99 are very strong and a correlation of 1.00 is perfect. Spearman's correlational coefficient was used due to the ordinal nature of the data. The number of class sessions in which a student was absent the four weeks prior to completing the survey were grouped into the following categories: (a) no absences, (b) one to two absences, (c) three to five absences, (d) six to 10 absences and (e) greater than or equal to 11 absences.

Methodological Limitations

The findings of this study may not be generalizable beyond the target population – undergraduate students in the College of Agricultural and Life Sciences at the University of Florida. Therefore, readers should use caution when generalizing the results of this study unless data confirms the target population of this study is representative of other populations of undergraduate students. Furthermore, close-ended survey questions limit the participants in the reasons for choosing to not attend class, thus all reasons for choosing to not attend class may not be represented.

Results

Objective One

Identify the Top 10 Reasons Why Undergraduate Students in the College of Agricultural and Life Sciences at the University of Florida Do Not Attend a Given Class.

Five of the top 10 reasons for not attending class were related to personal issues, but the most common reason was related to class structure, "Attendance is not taken," with 93.4% agreement. Class structure accounted for two of the top 10 reasons and instructor behaviors and issues accounted for three of the top 10 reasons. All of the top 10 reasons were agreed upon by a majority of students and the agreement percentage ranged from 62.5% to 93.4% (see Table 1).

Objective Two

Determine if Attendance is Influenced by (a) Class Size, (b) Class Scheduling, (c) Class Structure, (d) Course Classification, (e) Instructor Behaviors and Issues, (f) Student Performance, (g) Personal Issues and (h) Learning Activities.

Table 1. Top Ten Reasons Why Undergraduate Students in the College of Agricultural and Life Sciences at the University of Florida Do Not Attend a Given Class

I am likely to not attend class when…	%	Category
1. Attendance is not taken	93.4	Class Structure
2. An emergency arises - I have to meet an urgent unexpected need	90.6	Personal
3. I have a severe illness such as the flu	89.4	Personal
4. I have a funeral to attend	88.4	Personal
5. I have permission from the instructor to miss class because of a school related function	82.9	Instructor
6. The instructor does not know the content	70.1	Instructor
7. It would allow me to extend an out-of-town trip	67.7	Personal
8. I have a wedding to attend	64.6	Personal
9. The course content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)	63.7	Class Structure
10. Lectures of poor quality	62.5	Instructor

Class Attendance:

Class size

The majority of students did not agree class size influenced their decision to attend class. The percentage of students who agreed, however, that their attendance would be influenced by class sizes of greater than 45 students was substantially higher than those agreeing that a smaller class would affect attendance (Table 2). Additionally, the magnitudes of the associations between class size and the number of class sessions absent the four weeks prior to completing the survey were low.

Class scheduling

A complete summary of class scheduling issues is presented in Table 3. Only one reason was agreed upon by the majority of students, "The class meets the day before or after a holiday." Nearly half reported a religious holiday would influence attendance. The least agreed upon reasons dealt with certain days of the week, including Thursday, Tuesday and Wednesday. A majority (68%) of the class scheduling items had a low association with the number of class sessions absent the four weeks prior to completing the survey. However, 26% of the class scheduling items had moderate associations.

Class structure.

Students agreed several issues related to class structure influenced their decision to attend class (see Table 4). Six reasons were agreed upon by the majority of students, (a) "Attendance is not taken," (b) "The course content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)," (c) "The material covered in class is not consistently relevant to the exam," (d) "Attendance does not influence my grade," (e) "I have technology alternatives to get class content," and (f) "The instructor does not allow students to enter late." The least agreed upon reasons were (a) "My peers often miss class," (b) "I do not have the required materials for class," and (c) "The chairs/desks are not comfortable." Furthermore, 44% of the class structure items were moderately associated with the number of class sessions absent the four weeks prior to completing the survey.

Course classification

The majority of students did not agree course classification influenced their decision to attend class (Table 5). However, the students indicated they were more likely to miss class if the course was a general education course and were less likely to miss class if the course was a general elective not within their major, an elective within their major, or a required core course within their major. In addition, all of the course classification items had low associations with the number of class sessions absent the four weeks prior to completing the survey.

Instructor behaviors and issues

A summary of instructor issues is presented in Table 6. The majority of students agreed six instructor behaviors and issues influenced their decision to attend class. These included (a) "I have permission from the instructor to miss class because of a school related function," (b) "The instructor does not know the content," (c) "Lectures of poor quality," (d) "The instructor does not present information in an interesting way," (e) "The instructor does not present information in a clear manner," and (f) "The instructor just reads from his/her notes." The least agreed upon reasons were (a) "The instructor digresses," (b) "The instructor's handwriting is not readable," and (c) "The instructor does not allow for questions." Additionally, items related to the psychological closeness of the instructor and student had similar and consistent agreement ranging from 40.2% to 45.3% agreement and the associations between instructor behaviors and issue items and the number of class sessions absent the four weeks prior to completing the survey were low (74%) and moderate (26%).

Table 2. Class Size Issues that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
The class has more than 45 students	16.6	16.6	66.8	0.28
The class has 30 to 45 students	3.0	27.6	69.4	0.28
The class has 15 to 30 students	0.7	11.9	87.4	0.10
The class has less than 15 students	0.2	11.6	88.2	0.16

Table 3. Class Scheduling Issues that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
The class meets the day before or after a holiday	56.8	14.8	28.3	0.28
It is a religious holiday	49.8	17.7	32.5	0.03
It is my only class of the day	36.8	14.2	49.0	0.38
The class is scheduled in the morning	32.9	14.9	52.2	0.36
The class is hard to reach (e.g. far from where I live or work, parking is inconvenient)	31.6	16.1	52.2	0.30
The class is scheduled at an inconvenient time	30.5	18.5	51.0	0.31
I have a two or more hour break before or after class	27.8	16.8	55.5	0.27
The class meets on Friday	22.6	21.8	55.5	0.21
It is my first or last class of the day	20.5	16.7	62.8	0.30
The class session meets more than 3 hours	19.6	18.2	62.2	0.12
The class is scheduled to meet in the evenings	17.0	17.7	65.3	0.17
The class session meets 2 to 3 hours	13.6	16.6	69.8	0.12
The class session is less than 1 hour	11.0	17.2	71.8	0.18
The class is scheduled to meet at a location that is not the normal meeting location	10.5	22.3	67.2	0.16
The class meets on Monday	7.5	21.0	71.6	0.24
The class is scheduled to meet in the afternoon	6.3	18.6	75.1	0.13
The class session is 1 to 2 hours	3.2	23.6	73.2	0.22
The class meets on Wednesday	1.1	17.8	81.0	0.16
The class meets on Tuesday	0.7	23.6	75.7	0.20
The class meets on Thursday	0.1	22.9	77.0	0.18

Student performance

A summary of student performance issues is presented in Table 7. The majority of students agreed two student performance issues influenced their decision to attend class. The two reasons were (a) "I have deadlines for other academic work," and (b) "I am studying for a test in another course." Additionally, "I have already earned enough points for the grade I want" was agreed upon by 50% of the students. The least agreed upon reasons dealt with the level of success currently being experienced in a course and the difficulty of the course. Moreover, 42% of the associations between student performance items and the number of class sessions absent the four weeks prior to completing the survey were moderate and the remaining 58% were low.

Personal issues

There were eight personal issues students agreed influenced their decision to attend class and a complete summary is presented in Table 8. The items agreed upon by the majority of students included (a) "An emergency arises - I have to meet an urgent unexpected need," (b) "I have a severe illness such as the flu," (c) "I have a funeral to attend," (d) "It would allow me to extend an out-of-town trip," (e) "I have a wedding to attend," (f) "I have a job related conflict (e.g., an interview or work shift)," (g) "I oversleep," and (h) "I have the opportunity to attend a career/professional development event." The least agreed upon reasons were related to hunger, personal appearance and dislike for other students. Negligible (22%), low (59%) and moderate (19%) associations were found between the personal issues items and the number of class sessions absent the four weeks prior to completing the survey.

Learning activities

The majority of students did not agree any learning activities influenced their decision to attend class (see Table 9). The reason with the greatest agreement related to learning activities was "I cannot concentrate during lecture," and the reason with the least agreement was "The class contains group activities/discussion." Additionally, the associations between the learning activity items and the number of class sessions absent the four weeks prior to completing the survey were low (71%) and moderate (29%).

Table 4. Class Structure Issues that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
Attendance is not taken	93.4	5.0	1.5	- 0.07
The course content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)	63.7	13.2	23.1	0.35
The material covered in class is not consistently relevant to the exam	62.3	12.9	24.8	0.34
Attendance does not influence my grade	55.4	13.9	30.8	0.39
I have technology alternatives to get class content	51.2	15.7	33.1	0.39
The instructor does not allow students to enter late	50.3	17.7	32.0	0.16
I can make up the work	48.3	18.4	33.2	0.38
I do not feel obligated to attend	44.8	17.0	38.2	0.39
I am not interested in the course content	28.0	19.2	52.8	0.29
The course does not have pop quizzes	26.7	21.8	51.5	0.37
The instructor does not provide materials beyond that offered in the text, PowerPoint slides, or readings	26.5	18.7	54.8	0.20
Other students are disruptive	22.2	28.1	49.7	0.19
The scheduled class topic is boring	21.2	23.2	55.5	0.27
My peers often miss class	20.3	18.6	61.1	0.29
I do not have the required materials for class	18.2	24.7	57.1	0.19
The chairs/desks are not comfortable	8.0	18.0	73.9	0.20

Table 5. Course Classifications that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
The class is a general education course	17.7	13.9	68.4	0.24
The class is a general elective not within my major	10.6	20.6	68.7	0.28
This class is an elective within my major	3.2	20.1	76.7	0.23
The class is a required core course within my major	1.5	8.5	90.0	0.17

Table 6. Instructor Behaviors and Issues that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
I have permission from the instructor to miss class because of a school related function	82.9	8.9	8.2	0.11
The instructor does not know the content	70.1	13.2	16.7	0.26
Lectures of poor quality	62.5	14.4	23.1	0.32
The instructor does not present information in an interesting way	56.8	15.7	27.6	0.29
The instructor does not present information in a clear manner	54.1	13.4	32.4	0.27
The instructor just reads from his/her notes	51.4	15.7	32.8	0.33
The instructor is rude	45.3	21.0	33.7	0.22
The instructor does not care if I am in class	43.9	21.9	34.2	0.27
The instructor does not notice if I am in class	42.0	20.3	37.7	0.28
I am not respected by my instructor	40.2	21.9	37.9	0.19
The instructor's speech is unclear	39.8	18.4	41.7	0.28
The class is boring	35.5	17.6	46.9	0.34
I do not like the instructor	29.5	22.1	48.3	0.27
The instructor is repetitious	28.3	24.5	47.2	0.33
I like the subject matter, but the instructor is boring	24.4	19.8	55.7	0.30
The instructor goes too quickly	21.9	21.7	56.4	0.12
The instructor digresses	18.7	33.0	48.3	0.22
The instructor does not allow for questions	18.1	24.7	57.2	0.11
The instructor's handwriting is not readable	18.1	22.8	59.0	0.22

Objective Three

Compare Top 10 Reasons for Not Attending Class based on Student Attendance.

A few differences were found between the top 10 reasons students were likely to miss class and the number of class sessions in which students were absent (Table 10). "Attendance is not taken" was present among every category except the one to two absences category. "I have a wedding to attend" was not found in the six to 10 absences category. "The instructor does not know the content" was not identified in the ≥ 11 absences category. "It would allow me to extend an out-of-town trip" was not present in the no absences category. "The content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)" was not found in the no absences or one to two absences categories. "The material covered in class is not consistently relevant to

Table 7. Student Performance Issues that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
I have deadlines for other academic work	58.6	15.4	26.0	0.33
I am studying for a test in another course	56.6	15.5	28.0	0.40
I have already earned enough points for the grade I want	50.0	15.5	34.4	0.31
Class is before or after a test	45.1	14.6	40.3	0.32
I do not find the class challenging	32.0	19.2	48.8	0.30
I know the grade that I will receive	32.4	19.5	48.0	0.29
I have not completed an assignment that is due	31.5	17.9	50.6	0.23
I have not prepared for class	17.2	24.2	58.6	0.25
I am not capable of achieving the course objectives	10.5	21.7	67.9	0.17
Assignments are too easy	11.3	16.6	72.1	0.18
I am currently not experiencing success in the course	11.7	14.5	73.8	0.22
The course is difficult	3.9	14.3	81.8	0.17

Table 8. Personal Issues that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
An emergency arises - I have to meet an urgent unexpected need	90.6	5.3	4.1	0.09
I have a severe illness such as the flu	89.4	6.5	4.1	0.12
I have a funeral to attend	88.4	7.4	4.2	0.09
It would allow me to extend an out-of-town trip	67.7	13.6	18.8	0.31
I have a wedding to attend	64.6	19.2	16.2	0.15
I have a job related conflict (e.g., an interview or work shift)	55.7	19.2	25.1	0.09
I oversleep	55.1	17.4	27.5	0.36
I have the opportunity to attend a career/professional development event	52.7	21.7	25.7	0.16
I have a personal task/errand to do at that time (e.g., dentist appointment, airport pickup, shopping)	49.4	17.2	33.4	0.26
I have a campus-related appointment or activity at the time of class (e.g., to meet an advisor, to participate in an athletic event, attend an extracurricular activity)	48.2	19.9	31.8	0.20
I have to care for someone else (e.g., child or sick person)	46.4	24.8	28.8	0.05
I have out-of-town visitors	41.2	20.3	38.5	0.24
I have gone home and did not want to return to campus	40.9	16.8	42.3	0.36
The weather was bad	35.0	18.9	46.1	0.26
I did not have a ride to class	30.8	18.5	50.7	0.19
I feel tired from lack of sleep	30.1	18.7	51.2	0.37
I have a minor illness such as a headache, cold, or sore throat	27.3	19.4	53.2	0.17
I am embarrassed to walk in late	26.6	11.9	61.4	0.11
I am dealing with an emotional situation (e.g., relationship issues/breakup)	25.8	20.7	53.5	0.26
I am stressed	24.5	21.5	54.0	0.30
I do not feel safe on campus	22.0	16.5	61.4	0.01
The course does not relate to my personal career goals	20.3	21.8	57.9	0.26
I am recovering from alcohol or drug use (e.g., hangover)	17.6	23.1	59.3	0.25
I am concerned about my personal hygiene	14.3	26.9	58.8	0.08
I am too tired to go to class because of an active social life	13.4	16.2	70.5	0.33
I do not like participating in class	12.5	23.0	64.5	0.24
I want to attend a social event (e.g., party, movie, exercise with a friend)	12.2	14.7	73.1	0.27
I am spending time with my boyfriend, girlfriend, partner, or spouse	11.8	17.2	71.0	0.23
I feel socially isolated in class	9.9	20.1	70.0	0.24
I am hungry	8.9	18.0	73.1	0.21
I am concerned about my personal appearance	5.2	16.5	78.3	0.09
I dislike a student or other students in that class	4.3	18.2	77.5	0.17

Table 9. Learning Activities that Influence Class Attendance

I am likely to not attend class when…	Agree %	Neither agree or disagree %	Disagree %	r_s
I cannot concentrate during lecture	27.8	17.1	55.1	0.37
It is a review day	19.2	12.2	68.7	0.12
The activities in class do not lend themselves to my preferred way of learning	18.2	22.3	59.5	0.30
Other students are giving presentations	16.2	20.9	62.9	0.19
I do not want to participate in a scheduled activity	14.4	21.7	63.9	0.22
There is a guest speaker	8.8	17.5	73.8	0.19
The class contains group activities/discussion	6.7	15.0	78.3	0.14

the exams" was not identified as a top ten reason in the no absences and ≥ 11 absences categories.

"I have to care for someone else (e.g., child or sick person)", "It was a religious holiday" and "I have a job related conflict (e.g. an interview or work shift)" was only found in the top 10 of the no absences category. "Lectures are of poor quality" was only present in the no absences, three to five absences and six to 10 absences categories. "I have not prepared for class" was only identified in the one to two absences category. "Attendance does not influence my grade" was only found in the ≥ 11 absences category. Lastly, "I am studying for a test in another course was only present in the six to 10 absences category.

Summary

The purpose of this study was to add to the limited research of specific reasons why undergraduate students elect to not attend class and several of the reasons why students were likely to not attend class were consistent with prior research (Fjortoft, 2005; Friedman et al., 2001; Gump, 2004; Massingham and Herrington, 2006; Van Blerkom, 1992; Westrick et al., 2009). There were 23 reasons why the majority of students in this study were likely to not attend class (see Table 11). The top three items dealt with attendance not being taken, emergencies and illness. The top three categories of items were personal issues (8 of the 23), class structure (6 of the 23) and instructor behaviors and issues (6 of the

Table 10. Top Reasons Students are Likely to Miss Class Based on Self-Reported Class Attendance

Number of class sessions absent during the four weeks prior to the survey	Top 10 reasons to likely miss class	*f*
No absences	Attendance is not taken	110
	I have a funeral to attend	99
	An emergency arises - I have to meet an urgent, unexpected need	99
	I have a severe illness such as the flu	94
	I have permission from the instructor to miss class because of a school related function	89
	I have a wedding to attend	61
	I have to care for someone else (e.g., child or sick person)	57
	It is a religious holiday	56
	I have a job related conflict (e.g., an interview or work shift)	53
	The instructor does not know the content	53
1 to 2	I have not prepared for class	230
	An emergency arises - I have to meet an urgent, unexpected need	213
	I have a severe illness such as the flu	211
	I have a funeral to attend	203
	I have permission from the instructor to miss class because of a school related function	192
	The instructor does not know the content	158
	I have a wedding to attend	144
	It would allow me to extend an out-of-town trip	144
	Lectures are of poor quality	132
	The material covered in class is not consistently relevant to the exams	130
3 to 5	An emergency arises - I have to meet an urgent, unexpected need	237
	Attendance is not taken	235
	I have a severe illness such as the flu	234
	I have a funeral to attend	234
	I have permission from the instructor to miss class because of a school related function	215
	The instructor does not know the content	198
	It would allow me to extend an out-of-town trip	196
	The course content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)	188
	The material covered in class is not consistently relevant to the exams	184
	I have a wedding to attend	178
6 to 10	I have a severe illness such as the flu	118
	An emergency arises - I have to meet an urgent, unexpected need	116
	Attendance is not taken	113
	I have a funeral to attend	110
	I have permission from the instructor to miss class because of a school related function	110
	The course content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)	102
	It would allow me to extend an out-of-town trip	101
	The instructor does not know the content	100
	The material covered in class is not consistently relevant to the exams	99
	I am studying for a test in another course	98
	Lectures are of poor quality	97
≥ 11	I have a funeral to attend	48
	An emergency arises - I have to meet an urgent, unexpected need	47
	Attendance is not taken	47
	I have a severe illness such as the flu	46
	Lectures are of poor quality	45
	I have permission from the instructor to miss class because of a school related function	45
	It would allow me to extend an out-of-town trip	44
	Attendance does not influence my grade	44
	I have a wedding to attend	43
	The course content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)	43

Table 11. Reasons that the Majority of Undergraduate Students Choose to Not Attend Class

I am likely to not attend class when…	%	Category
1. Attendance is not taken	93.4	Class Structure
2. An emergency arises - I have to meet an urgent unexpected need	90.6	Personal
3. I have a severe illness such as the flu	89.4	Personal
4. I have a funeral to attend	88.4	Personal
5. I have permission from the instructor to miss class because of a school related function	82.9	Instructor
6. The instructor does not know the content	70.1	Instructor
7. It would allow me to extend an out-of-town trip	67.7	Personal
8. I have a wedding to attend	64.6	Personal
9. The course content is available from another source (e.g., I can get it from the text, web, tutor, classmate's notes)	63.7	Class Structure
10. Lectures of poor quality	62.5	Instructor
11. The material covered in class is not consistently relevant to the exam	62.3	Class Structure
12. I have deadlines for other academic work	58.6	Student Performance
13. The instructor does not present information in an interesting way	56.8	Instructor
14. The class meets the day before or after a holiday	56.8	Class Scheduling
15. I am studying for a test in another course	56.5	Student Performance
16. I have a job related conflict (e.g., an interview or work shift)	55.7	Personal
17. Attendance does not influence my grade	55.4	Class Structure
18. I oversleep	55.1	Personal
19. The instructor does not present information in a clear manner	54.1	Instructor
20. I have the opportunity to attend a career/professional development event	52.7	Personal
21. The instructor just reads from his/her notes	51.4	Instructor
22. I have technology alternatives to get class content	51.2	Class Structure
23. The instructor does not allow students to enter late	50.3	Class Structure

23). Student performance (2 items) and class scheduling (1 item) were also represented in the 23 reasons agreed upon by a majority of students. In addition, most of the associations between reasons students are likely to not attend class and the number of class sessions absent had a low or moderate magnitude. Since no one item explained a large portion of the variance in absences, the low and moderate associations support the finding that there are multiple reasons (23 in this study) for which students are likely to not attend class. Furthermore, differences in the top ten reasons to not attend class based upon the student attendance categories only differed slightly. This suggests that regardless of the number of class sessions missed the top 10 potential reasons for missing class do not differ for a majority of the students.

Similar to Marburger (2001), the results of this study show that the undergraduate students were more likely to not attend class on Friday as compared to other days of the week. Furthermore, Romer (2001) hypothesized that the differences in attendance rates may be a result of class size. Supporting, Romer's hypothesis an increase in agreement percent to not attend class was noted in this study. However, a majority of students did not agree class size influenced their decision to not attend class.

Many of the reasons students agreed upon were related to Maslow's (1970) hierarchy of basic needs, though not all of the items related to Maslow were shown to influence class attendance. In regard to physiological needs, the undergraduate students suggested severe illness and oversleeping would influence their decision to attend class, but few students agreed a minor illness or being hungry were reasons to be absent. This finding is encouraging because it suggests that minor physiological needs do not deter students from attending class. Safety needs such as feeling safe on campus and disruptive students appear to have a minor effect on the decision to not attend class in this study. This may suggest that College of Agricultural and Life Sciences students believe the University of Florida has few issues related to student safety. Data related to love and belongingness needs revealed mixed results. Attending events like a funeral or a wedding were agreed upon as a reason to be absent by a majority of students, but attending a social event or spending time with a boyfriend, girlfriend, or partner had low agreement. This is also encouraging because the students indicated major life events were reasons to be absent from class, but casual social events were not reasons to miss class.

Additionally, teacher-student rapport is related to love and belongingness and esteem needs. The items related to love and belongingness showed moderate agreement and therefore, appear to have an influence on students' decisions to not attend class. Furthermore, the item "I have already earned enough points for the grade I want" is related to esteem and had moderate agreement. Thus, the aforementioned item also appears to influence class attendance and may partially explain why previous studies (Marburger, 2001; Rodgers, 2001; Van Blerkom, 1992, Zhao and Stinson, 2005) found class attendance decreases as the academic term progresses. What's more, having a job related conflict was agreed upon by a majority of the students and this may be associated with meeting a physiological need, love and belongingness need and/or esteem need. In regard to Maslow's final category of needs, self-actualization, course difficulty and not being capable of achieving course objectives were agreed upon by very few students as a reason to not attend class. This may suggest that College of Agricultural and Life

Sciences students are striving toward self-actualization. Ormrod (2008) stated, "*individuals striving toward self-actualization seek out… and want to learn for the sake of learning*" (p. 459).

Many of the reasons students agreed upon were related to Atkinson's (1957) expectancy-value theory of achievement motivation. A majority of the student agreed other academic work or studying for a test in another course were reasons to not attend class. This may indicate that the undergraduate students place greater value on completing pressing assignments or studying for an approaching test than attending a given class and the possibility of success on immediate academic tasks prevail over the possibility of failure on future academic tasks. Also, instructor knowledge and quality of instruction influenced the students' decision to attend class, which suggests the students placed little or no value on attending classes where the instructor lacked subject matter knowledge or facilitated learning experiences of poor quality. Moreover, this study suggests less value was placed on attending a class in which the information could be obtained from another source, missed work could be made up, the class was before or after a holiday, missing the class would extend an out-of-town trip, it is a religious holiday, attendance does not influence their grade or is not taken and when students had already earned the desired grade.

Based on the results of this study, the following recommendations are given to faculty/ instructors for increasing class attendance in the College of Agricultural and Life Sciences at the University of Florida:

1. Take attendance. Attendance not being taken was the number one reason students were likely to not attend class. In larger classes where taking attendance is more cumbersome and is not an effective use of instructional time, teaching assistances could be utilized for this task. Other strategies that could be considered are sign-in sheets, clickers, seating charts, arriving early and taking attendance as students arrive to class, short in-class assignments, ticket-out-the-door activities and question/comment cards. The authors recognize each of the aforementioned strategies have their shortcomings and may not be appropriate for every class session or instructor. Therefore, the authors suggest using a variety of attendance strategies.

2. Know the course content. Subject matter knowledge is essential to effective teaching (Darling-Hammond and Bransford, 2005).

3. Develop quality lectures/class sessions. McKeachie (2010) is a resource that provides tips on making lectures and courses more effective.

4. Discuss how the material covered in-class relates to the assignments/exams in the course. This will help the student understand the relevance of the in-class material and make connections to future use.

5. Plan rigorous courses. Only 3.9% of the students agreed that they were likely to not attend class if the course was difficult.

6. Present information in an interesting and clear manner. A majority of the students agreed they were likely to not attend if the information was not interesting or presented clearly. Interest can be developed by allowing students to test/use new knowledge, using students' prior knowledge and experiences, raising perplexing questions, showing specimens, pictures, short video clips, case studies, presenting students with a problem to be solved and so forth. Teachers that demonstrate clarity explain concepts in a concise and clear manner, provide clear directions for activities and assignments, answer questions intelligently, create an organized lesson and do not use vague words (Rosenshine and Furst, 1971).

7. Allow students to enter late. Not allowing students to enter late was a reason that was agreed upon by a majority of the students.

8. Develop teacher-student rapport. Teachers who exhibit characteristics such as being considerate, understanding, approachable, democratic, reliable, encouraging, having positive body language, encourages questions and comments from students, provides clear expectations, knows the students by name, utilizes high levels of verbal and nonverbal teacher immediacy behaviors and so forth are described as being effective at building teacher-student rapport (Wilson et al., 2010).

Based on the results of this study, the following recommendations are given to administrators for increasing class attendance in the College of Agricultural and Life Sciences at the University of Florida: (a) minimize school related functions during instructional time; (b) consider the timing of religious holidays when planning the academic calendar; (c) promote the importance and relevance of general education courses; (d) provide teaching and learning professional development opportunities for faculty/instructors in student engagement, planning and delivering quality lectures, instructor clarity and building teacher-student rapport; and (e) ensure faculty/instructors possess subject matter expertise in the courses they assigned to teach.

Future research should seek to determine if other populations of undergraduate students agree upon similar reasons for not attending class. This information could be used to improve class attendance among other populations. One limitation of this study was that the close-ended survey questions limited the participants' reasons for choosing to not attend class. Qualitative research or open-ended survey questions could be utilized to allow for other possible reasons for not attending

class. Future research should also further investigate the influence of the following on class attendance: (a) class size, (b) class scheduling, (c) class structure, (d) course classification, (e) instructor behaviors and issues, (f) student performance, (g) personal issues and (h) learning activities.

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Using Interactive Flash Games to Enhance Students' Learning in Animal Sciences[1]

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Abstract

The objective of this paper is to demonstrate how the use of interactive flash games in three animal science courses enhances student learning and comprehension of complex concepts and difficult new material and improves test scores. Flash games were used as companion tools to Feeds and Feeding, Applied Animal Nutrition and Animal Reproduction courses taught at the University of Minnesota, Crookston. The template for flash games was the same for all courses. In two studies, student learning and comprehension of course material were tested. The first study used student final exam scores from the three courses to compare the efficacy of flash games in improving students' test scores with that of commonly used study guides. The exam format for all students was a "mixed exam" containing multiple choice and essay questions. The second study used two courses and two test formats: the "mixed format" as in the first study and an "all multiple choice exam." Scores from two midterms and one final exam were used in this study. In both studies, flash games and study guides covered the same learning material. Exam scores and student surveys clearly supported flash games as an effective technology in improving student comprehension and enhancing learning. In study 1, for all three courses, students' exam scores using flash games were improved by an average of 16.0 ± 2.64 points over study guides. More than 90% of students indicated flash game-assisted instruction contributed to better learning. In study 2, for the two courses, flash games showed an improvement of student test scores by 23.7 ± 1.07 points over the study guides.

Introduction

Recent focuses on student-centered approaches have revitalized interest in alternative teaching and learning perspectives (Hannafin and Land, 1997). Several teaching methods are being used in the classroom to enhance student learning. These methods defined by Western Kentucky University's Center for Teaching and Learning (Western Kentucky, 2001) included active learning, critical thinking, problem-based learning, case-based learning, collaborative/cooperative learning, service learning and other instructional types. Flash games teaching is an instructional approach designed to support active, critical thinking and problem-based learning; however, it could be used to support several other types of teaching methods. With the increased volume of information and students' need to process that information in a more meaningful manner, faculty are steadily gaining more interest in exploring different ways to make learning more engaging and enjoyable for students. The rapid proliferation of technology can and will continue to impact the educational paradigm on college campuses (Mehlhorn et al., 2007).

The use of Tablet PC (White et al., 2007), compact discs (Jones et al., 1995), podcasts (Burcham et al., 2007), custom built lock-out buzzers with timers (Headings,

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2007), video tutorials (Musunuru and Beutner, 2007) and class blogs (Spindler, 2007) help create deeper connections with students and a more student centered course context (Spindler, 2007). Jones et al. (1995) indicated that most evaluations of the effectiveness of technology focus on the technology itself, its costs, its complexity and its feasibility in particular circumstances; but they do not examine its effectiveness as a tool for learning. Interactive flash games, built as companion tools to courses, could be an effective technology used to enhance student learning. The objective of this paper is to demonstrate that computer-based interactive flash games used in three animal science courses are effective in enhancing student learning and improving student exam scores over commonly used study guides.

Material and Methods

Two studies were conducted to compare student exam scores using interactive computer flash games versus commonly used study guides learning methods. One flash game and one study guide was used per exam and per course. One final exam was used in study 1. Two midterms and one final exam were used in study 2. The final exams in each course were cumulative. The two learning methods are described as follow:

Interactive Flash Games Study Method

A flash game template was designed by the University of Minnesota, Crookston Information Technology Center (ITC) for faculty use to supply students with questions that would help them learn course material. The template was filled by the instructor with interactive games of multiple choice questions. Games were called flash games because study questions were drawn randomly from a pool of questions like in flash card games. Games were built as companion tools to Feeds and Feeding (sophomore level), Applied Animal Nutrition (junior-senior level) and Animal Reproduction (junior-senior level) courses.

Questions in a flash game were related to simple and complex concepts or to new terminology and were designed with the choice of four answers for each question. For example in the Applied Animal Nutrition course, a question might ask for the definition of a simple word such as "glycolysis" or a complex concept (e.g., calculating the total energy (ATP) derived from the complete oxidation of a long chain fatty acid in the Krebs's cycle). A single flash game contains 80 questions drawn from five to six chapters of a course. The interactive template displayed three sections (Figure 1): "Question", "Ask" and "Answer." Multiple choice questions were fed into the question section (bottom section of the figure 1). The "ask" section was a help section (middle section of the figure 1) that provided support to an individual student to learn collaboratively by interacting with the instructor, classmates or another student. Students used the "ask" section to ask for help when they did not know or doubted an answer to a question. In case of doubt, they had the option to ask the opinion of either "the Instructor" or "the Class" or "a Student" in the classroom. The instructor always gave the correct answer to a question (100% right and 0% wrong).

Answers provided by the class as a group of students were programmed to be 75% right and 25% wrong and answers provided by a random single student were programmed to be 50% right and 50% wrong. The ratios of right versus wrong answer from the help section were initially set in the template by the ITC in order to make the games more interactive. The answer section of the figure displayed the response (correct or wrong) to the question. For time management and effective active

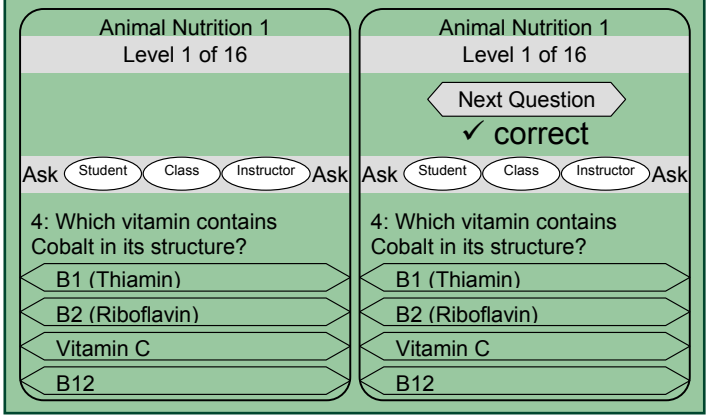

Figure 1. Applied Animal Nutrition Game 1 – Level 1 of 16 showing question 4 (left panel) randomly selected from the 80 questions in the game and the four possible answers (bottom section). The Ask section provides help from student, class, or instructor (middle section). In the right panel the student learner answered question 4 correctly (by choosing B12) and gets correct with a "✓" (top section). Then the student goes to the next question as indicated in the answer box (top section). A level is the same as a question.

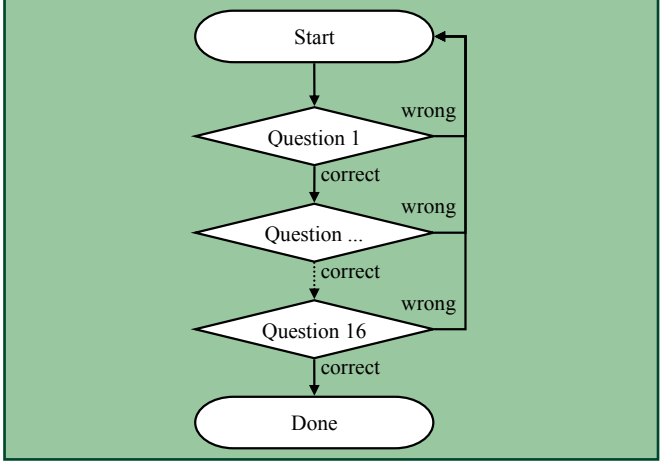

Figure 2. Flow diagram of flash game study exercise for Applied Animal Nutrition, Animal Reproduction, and Feeds and Feeding courses.

learning, questions were played in a group of 16 questions (or levels) with the degree of difficulty increasing with each question. The initial question was drawn randomly from the pool of 80 questions. Each successive question became more difficult and was selected randomly from the remaining questions in the pool. In order to proceed to the next question, the student learner had to successfully answer the previous question. A wrong answer to any of the 16 questions automatically stops the game and the learner was prompted to start a new game (Figure 2).

Students could stop the game at any time by closing the window. The course instructor's assistance was not required for students to be able to use and learn from the flash games. For learning to occur students were encouraged to reflect upon each question and explain to themselves why their answers were correct or incorrect. Also, they were encouraged to learn collaboratively by interacting with the "ask" section of the game; however, they could query the instructor, the class and students only one time per group of 16 questions. On average, it took three to four hours of continuous active learning for students to fully master one game. Each course had three or four games, depending on course content, which made a total of 240 or 320 questions for a course. Flash games were introduced in the three courses in different years. Applied Animal Nutrition and Animal Reproduction were the first courses to integrate the games.

Study Guides Method

Each course was supplemented with a study guide containing no less than 30 short and long essay questions designed to cover the same chapters as the flash games for an exam. This was done to minimize the effect of course material difficulty on the experimental error which would occur if two different sets of materials were used. The following four questions illustrate the types of questions for a study guide in the Feeds and Feeding and Animal Reproduction courses:

1. List morphological and nutrient content differences between a forage legume and a forage grass (short answer for Feeds and Feeding).
2. Discuss nitrate poisoning, prussic acid poisoning and grass tetany in cattle (long answer in Feeds and Feeding).
3. Define these terms: reproductive physiology andrology, gynecology, theriogenology and obstetrics (short answer in Animal Reproduction).
4. Draw and explain positive and negative hormonal feedback mechanisms (long answer in Animal Reproduction).

Questions on all exams were slightly modified from the questions in flash games and study guides. This adjustment was made to ensure that students were not just memorizing the information. Although questions on study guides and flash games covered the same material, questions on exams based on these two study methods, were different. For example in the Animal Nutrition course, a study guide question worth 10 points for lipid and fatty acids properties might be: discuss the physical proprieties of fatty acids, solubility in water, melting point, degree of saturation, susceptibility to oxidation, iodine number and saponification number. Whereas the flash game might include five multiple choice questions on lipid and fatty acids worth 2 points each asking the following questions: where is an ester bond found; which fatty acid is an omega-3; which fatty acid is not essential; which fatty acid is unsaturated; and what are the components of a triglyceride with each question having four answer choices.

Data collection and Learning Assessment

In two studies, student learning and comprehension of the course material were tested. In the first study, student grade reports were used to collect final exam scores data of 95 students enrolled in Applied Animal Nutrition course (ANSC 3104) from 2003 to 2007, 58 students in Feeds and Feeding (ANSC 2104) from 2006 and 2007 and 64 students in Animal Reproduction (ANSC 3304) in 2003, 2006 and 2007. Student school identification numbers were used to gather the data; therefore, student names were not part of the process. The data was used to compare students' performance based on using flash games and study guides as supporting materials for the courses but also considered as study methods for the course material. All three courses were taught by the same instructor and exams were administered in the same classroom for all years. Animal Reproduction was taught by another instructor in 2004 and 2005; therefore, scores for these years were not included in the data.

In the first study, only the final cumulative exam was used. Students had three to four flash games and three to four study guides to use as study tools for the final exam. Exams consisted of two sets of questions and were scored on 200 points. The first set of questions, drawn from flash games, made up one half of the exam points (100 points) and the second set, drawn from course study guides, made up the other half of the points (100 points). The questions for both sets of the exam were balanced to measure student scores based on the two learning methods. All students were tested on both sets of questions and their scores for the set from the flash games were compared to the scores of the set from the study guides. This statistical design used a student as his/her own control; therefore, the error from the experimental unit was removed.

At the completion of each course in 2006 and 2007, students filled out a survey of their own perception about using and learning from flash games. The survey did not include the study guide learning method because the instructor had already integrated this learning approach into all of these courses prior to the introduction of the flash games; therefore, study guides were the control learning method against which flash games were compared.

In the second study, exam scores of 93 students enrolled in Feeds and Feeding (ANSC 2104) and 53 students in Applied Animal Nutrition (ANSC 3104) were collected in 2010 and 2011. The data was used to compare student test score performance based on the two study methods (flash games versus study guides) and two exams formats (an all multiple choice exam versus a mixed exam). One flash game and one study guide was available to study from for each exam. The all multiple choice exam (AMC) had two sets of questions; the first set of 50 questions was drawn from the flash games and second set of 50 questions drawn from the study guides for a total of 100 points for the exam.

The mixed exam (MIX) weighted on 100 points also had two sets of questions, the first set of questions drawn from the flash game contained 50 multiple choices questions worth 50 points and the second set, drawn from the study guides contained 10 to 12 short and long essay questions worth 50 points. During each year and for each course, students had two midterms (exam 1 and 2) and one cumulative final exam (exam 3). Students had the absolute choice to take the exam format they desired. They signed a consent form to take the exam and did not agree to take a random exam (either AMC or MIX). They feared a random exam would not allow them to use their testing skills to obtain a good grade.

Statistical Analysis

Data was analyzed with a generalized least squares method (mixed procedure of SAS; Littell et al., 1996). In the first study, fixed effects included in the model were study method, year and the interaction of study method x year. In the second study, the model included the study method, the exam format and the interaction of study method x exam format.

Results and Discussion

Study 1

The means of final exam scores (200 points) for the three courses are reported in Table 1. Students usually had higher average scores in Feeds and Feeding, intermediate scores in Animal Reproduction and lower scores in Applied Animal Nutrition. Applied Animal Nutrition integrated more biochemical and mathematical concepts to economical feeding of farm animals; therefore, tended to be more challenging to students than the other two courses. Differences between courses might also be due to the fact that different students were evaluated in the three courses over the different years as shown by the interaction study method x year for the Animal Applied Nutrition and Animal Reproduction (Table 3).

The contribution of flash games (100 points) versus study guides (100 points) to the means scores within courses is reported in Table 2. For all three courses, student average scores for flash games were higher ($P < 0.01$) than those for study guides. Differences of means are also shown in Table 2. For all three courses, there was an average of 16.0 ± 2.64 points advantage of flash games over study guides. Within courses, there were 15.3 ± 3.09 points, 19.3 ± 2.42 points and 13.4 ± 2.95 points advantage of flash games over study guides for Feeds and Feeding, Applied Animal Nutrition and Animal Reproduction, respectively. Bloom and Hough (2003) reported that computer-based learning across elementary, secondary, higher and adult education programs increased students' test scores by 10 to 20 percentile points. Jeffries (2001) also found a significantly higher knowledge level of students using an interactive multimedia CD-ROM in a nursing course than students who did not use the CD-ROM. The impact of flash games on students' scores was more dramatic in Applied Animal Nutrition (the course with the lowest grades) indicating that flash games could be highly beneficial to enhancing student learning in courses with difficult concepts. However, for all courses, flash games were shown to be helpful to students to learn the course material and improve their final exam scores.

Table 1. Least Squares Means of Final Exams Scores (over 200 points) for Feeds and Feeding (ANSC 2104) in 2006 and 2007, Applied Animal Nutrition (ANSC 3104) in 2003 through 2007, and Animal Reproduction (ANSC 3304) in 2003, 2006 and 2007

Course	N[1]	Score, LSMEAN[2]	SEM[3]
ANSC 2104	58	165.36	3.98
ANSC 3104	95	131.98	2.42
ANSC 3304	64	147.40	3.56

[1]Number of students in each course
[2]Least squares mean over 200 points
[3]Standard error of the mean

Table 2. Least Squares Means and Means differences of Final Exams Scores for flash games (over 100 points) versus study guide methods (over 100 points) for Feeds and Feeding (ANSC 2104) in 2006 and 2007, Applied Animal Nutrition (ANSC 3104) in 2003 through 2007, and Animal Reproduction (ANSC 3304) in 2003, 2006 and 2007

		Method						
Course	N[1]	Flash	Study	SEM[2]	P	Diff[3]	SED[4]	P
ANSC 2104	58	90.32	75.04	2.52	<0.01	15.28	3.09	<0.001
ANSC 3104	95	75.65	56.32	1.72	<0.01	19.34	2.42	<0.001
ANSC 3304	64	80.4	67.00	2.31	<0.01	13.41	2.95	<0.001

[1]Number of students in each course
[2]Standard error of the mean
[3]Least squares mean differences
[4]Standard error of mean differences

The advantage of flash games over study guides was observed over multiple years for each course (Table 3). Method of studying material was always significant (P <0.001) for all three courses. The year the exam was taken had no significant effect on how students scored on exams, except for Applied Animal Nutrition (P = 0.05). However, the interaction between method and year was significant (P <0.001) for Applied Animal Nutrition and Animal Reproduction courses (Table 3). Flash games were introduced first in these two courses in 2003. When flash games were introduced to students they did not use them much to study, because they did not know the value of the games. In fact, because students did not know the value of using flash games the first year (2003), their exam scores for the two methods were not different (P ≥ 0.47) in Applied Animal Nutrition and Animal Reproduction. As students became familiar with the games and learned how helpful they were to study, the word spread among students in subsequent years. In 2004, flash games tended to improve (P = 0.07) scores by 11.7 points but in 2005 scores were again not different (P = 0.18) for Applied Animal Nutrition (Table 3).

Table 3. Effect of method of studying (Flash games versus Study guides) within courses on final exam scores per year

Course/Year	Method		SEM[1]	Probability		
	Flash	Study		Method	Year	Method*Year
ANSC 2104				**< 0.001**	**0.53**	**0.51**
2006	90.2	73.6	2.2	<0.001		
2007	87.3	73.6	2.3	<0.001		
ANSC 3104				**< 0.001**	**0.05**	**< 0.001**
2003	73.8	69.1	4.6	0.47		
2004	67.2	55.4	4.6	0.07		
2005	74.9	66.4	4.4	0.18		
2006	74.1	47.8	4.7	<0.001		
2007	83.7	47.3	3.6	<0.001		
ANSC 3304				**< 0.001**	**0.28**	**< 0.001**
2003	73.0	75.3	3.1	0.60		
2006	83.5	58.3	3.2	<0.001		
2007	84.5	66.8	2.9	<0.001		

[1]Standard error of the mean

By 2006, scores for the two methods were significantly different (P < 0.001) in all courses with higher scores for the flash game method. The advantage of flash games over study guides could be explained by factors such as more precise presentation of the information, less wording, less memorization, highly visual and more time exposure to the same information. It also appears students prefer using flash games over study guides in Applied Animal Nutrition, because scores have decreased over the years (except in 2005) for the study guides method whereas scores tended to increase with the flash game method.

Student response to their perception about flash games as learning tools is shown in Table 4. The survey showed that the majority of students (87% or more) for all three courses agreed or strongly agreed with the following statements:

1. Flash games helped me study for exams.
2. Flash games helped me learn course material.
3. Flash games helped me improve my test scores.
4. Flash games are effective technology enhanced learning tools.
5. I believe flash game-assisted instruction contributed to better learning.

Response of students to statement 5 above is similar to student perception about technology assisted instruction reported by Burris and Doerfert (2007) and Bloom and Hough (2003). Daley et al. (2001) also found that students' attitudes and perceptions of technology influenced their ability to acquire and integrate knowledge, extend and refine knowledge and use knowledge meaningfully.

Table 4. Summative perception of students from surveys completed in 2006 and 2007 about flash games as learning tools in three courses: Feeds and Feeding (ANSC 2104); Applied Animal Nutrition (ANSC 3104); and Animal Reproduction (ANSC 3304)[1]

Question	Course	Response, %				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Flash games helped me study for exams?						
	2104	73	27	--	--	--
	3104	60	40	--	--	--
	3304	70	30	--	--	--
Flash games helped me learn course material?						
	2104	71	29	--	--	--
	3104	35	52	13	--	--
	3304	51	44	5	--	--
Flash games helped me improve my test scores?						
	2104	85	15	--	--	--
	3104	60	35	5	--	--
	3304	79	16	5	--	--
Flash games are more helpful to study and comprehend the information than the study guides that cover the same material?						
	2104	44	15	41	--	--
	3104	35	26	39	--	--
	3304	30	35	30	5	--
Based on course content, I think some flash game questions are harder than others?						
	2104	15	61	0	24	--
	3104	30	58	12	--	--
	3304	25	65	5	5	--
In general, I think flash games are effective technology enhanced learning tools.						
	2104	71	29	--	--	--
	3104	49	42	9	--	--
	3304	44	56	--	--	--
I think flash games should be introduced in other UMC courses?						
	2104	56	44	--	--	--
	3104	42	44	14	--	--
	3304	56	39	5	--	--
In general, do you believe flash games-assisted instruction contributed to better learning?						
	2104	56	44	--	--	--
	3104	44	47	9	--	--
	3304	60	35	5	--	--

[1]Number of students who completed the survey for ANSC 2104 was 41; ANSC 3104 was 43; and ANSC 3304 was 43.

The survey also showed that 100% of students in all courses recommended using flash games as companion instructional tools to these courses (data not shown). Based on course content, the majority of students (76 to 88%) thought some flash game questions were harder than others. When comparing flash games with study

guides as learning tools for all courses, 59% to 65% of students indicated that flash games were more helpful to study and comprehend the information than study guides that covered the same course material; 30% to 41% of students were neutral and 5% disagreed with this statement (Table 4). Students who were neutral or disagreed thought that study guides were also helpful and that they were complementary to the flash games in facilitating learning. This statement implies that when students were exposed to similar course information, there could be an associative effect of learning methods which would be difficult to separate statistically.

Table 5. Least squares means of flash games and study guides within exam format for Feeds and Feeding (ANSC 2104) and Applied Animal Nutrition (ANSC 3104) for the combined two years

ANSC 2104												
	Flash	Study			Flash	Study						
	--------AMC[1]--------				--------MIX[2]--------							
Exam	N[3]	Mean[4]		SEM[5]	N[3]	Mean[4]		SEM[5]	Year	Format	Method	Format x Method
1	77	84	53	1.5	16	91	76	3.3	0.126	<.0001	<.0001	0.0024
2	64	85	61	1.6	23	93	76	2.3	0.351	<.0001	<.0001	0.0374
3	61	85	51	1.4	21	90	82	2.5	0.006	<.0001	<.0001	<.0001
ANSC 3104												
	Flash	Study			Flash	Study						
	--------AMC[1]--------				--------MIX[2]--------							
Exam	N[3]	Mean[4]		SEM[5]	N[3]	Mean[4]		SEM[5]	Year	Format	Method	Format x Method
1	43	81	50	2.3	10	85	62	5.1	0.721	0.0569	<.0001	0.2911
2	28	78	46	3.2	24	75	52	3.4	0.916	0.7059	<.0001	0.153
3	27	68	45	2.9	23	75	48	3.1	0.024	0.1039	<.0001	0.5495

[1]All multiple choice exam
[2]Mix exam (multiple choice and essay questions)
[3]Number of students who took the exam (i.e., for ANSC 2104: Exam 1, 77 students took AMC exam, and 16 students took MIX exam. For AMC and Mix, questions were based on flash game and study guide)
[4]Mean in percent for exam questions based on flash game and study guide
[5]Standard error of the mean

Testing student learning with two different course materials would not have been conclusive. This is because of the error that would be introduced in the data by the differences in materials which could include degree of difficulty and student interest in the material. Jones et al. (1995) pointed out that student learning could not be solely defined by how well students performed on standardized tests but also by the extent to which technology promoted students engaged learning and collaboration. More than 90% of students indicated flash game-assisted instruction contributed to better learning.

Table 6. Means and Differences of Means of Three Exam Scores for Feeds & Feeding (ANSC 2104)

Effect	Exam Format	Study Method	LS[1] Means	SEM[2]			
Method		Flash	88.3	0.89			
Method		Study	66.8	0.89			
Format	AMC		70.3	0.63			
Format	MIX		84.7	1.11			
Format x Method	AMC	Flash	84.9	0.89			
Format x Method	AMC	Study	55.7	0.89			
Format x Method	MIX	Flash	91.7	1.54			
Format x Method	MIX	Study	77.9	1.54			
Effect	**Exam Format**	**Study Method**	**Exam Format**	**Study Method**	**Means Diff[3]**	**SED[4]**	**P**
Method		Flash		Study	21.5	1.24	<0.001
Format	AMC		MIX		-14.4	1.27	<0.001
Format x Method	AMC	Flash	AMC	Study	29.2	1.25	<0.001
Format x Method	AMC	Flash	MIX	Flash	-6.6	1.77	<0.001
Format x Method	AMC	Flash	MIX	Study	7.0	1.77	<0.001
Format x Method	AMC	Study	MIX	Flash	-35.8	1.77	<0.001
Format x Method	AMC	Study	MIX	Study	-22.2	1.77	<0.001
Format x Method	MIX	Flash	MIX	Flash	13.7	2.33	<0.001

[1]Least squares means
[2]Standard error of the mean
[3]Means difference
[4]Standard error of the mean difference

Study 2

The means of the three exam scores for flash games and study guides within exam formats (AMC versus MIX) for the two courses are reported in Table 5. Similar to the first study, study method is also significant in this second study ($P < 0.0001$) for both courses and the three exams. The mean scores for flash games were higher than those of study guides for Feed and Feeding (88.3 versus 66.8 points) with a mean difference of 21.5 ± 1.24 (Table 6) and for Applied Animal Nutrition (76.6 versus 50.3 points) with a mean difference of 26.3 ± 1.84 (Table 7). This second study confirmed the learning advantage of the computer-based flash games over the common essay-type study guides. This finding is also in agreement with data reported by Bloom and Hough (2003) and Jeffries (2001).

The exam format was significant ($P < 0.0001$) for the Feeds and Feeding course but not for the Applied Nutrition course ($P > 0.05$) (Table 5). Students who chose the AMC exam scored significantly lower than those who chose the MIX exam in Feeds and Feeding (70.3 versus 84.7 points) with a mean difference of (-14.4 ± 1.27) (Table 6). For the Applied Animal Nutrition course, there was no difference ($P > 0.05$) in the mean score based on exam format; however, student who chose the MIX exam had 4.8 ± 1.92 points advantage over those who chose the AMC exam (Table 7). There was a significant exam format x study method interaction for the three exams in the Feeds and Feeding ($P < 0.04$) course, but the interaction was not significant for the Applied Animal Nutrition course ($P > 0.15$) (Table 5) with the separation of mean differences reported in Tables 6 and 7.

Conclusions

Interactive flash games are technology-enhanced tools that can be used to improve classroom teaching and student learning. They are individual student learner-centered and allow for interactive collaborative learning. The instructor's assistance is not required for individual student learning to occur. In the first study, for all three courses, student exam scores improved by an average of 16.0 ± 2.64 points using flash games over study guides. In the second study, the flash game study method had a 21.5 ± 1.24 points for Feeds and Feeding, 26.3 ± 1.84 points for Applied Animal Nutrition and an average of 23.7 ± 1.07 points advantage for both courses over the study guides. Students did better with a mixed exam format than with an all multiple choice exam. The MIX exam had 14.4 ± 1.27 points for Feeds and Feeding, 4.8 ± 1.92 for Applied Animal Nutrition and an average of 10.4 ± 1.09 points advantage for both courses over the AMC exam.

In conclusion, student final exam scores and the learning perception survey showed that flash games are effective tools in enhancing student learning and improving the exam average score over more commonly used study guides. More than 90% of students indicated flash game-assisted instruction contributed to better learning. The flash game template can be easily adapted to various courses. Further studies including randomization of student assignment to exam model, the effect of actual student time spent studying the material from flash games and study guides on exam scores, a comparison of traditional instructor-led study groups with the flash games and testing flash game model on larger universities are warranted.

Table 7. Means and Differences of Means of Three Exam Scores for Applied Animal Nutrition (ANSC 3104)

Effect	Exam Format	Study Method	LS[1] Means	SEM[2]			
Method		Flash	76.6	1.30			
Method		Study	50.3	1.30			
Format	AMC		61.1	1.14			
Format	MIX		65.7	1.50			
Format x Method	AMC	Flash	75.4	1.60			
Format x Method	AMC	Study	46.8	1.60			
Format x Method	MIX	Flash	77.8	2.09			
Format x Method	MIX	Study	53.9	2.09			
Effect	**Exam Format**	**Study Method**	**Exam Format**	**Study Method**	**Means Diff[3]**	**SED[4]**	**P**
Method		Flash		Study	26.3	1.84	<0.001
Format	AMC		MIX		-4.8	1.92	<0.001
Format x Method	AMC	Flash	AMC	Study	28.6	2.24	<0.001
Format x Method	AMC	Flash	MIX	Flash	-2.4	2.66	<0.001
Format x Method	AMC	Flash	MIX	Study	21.5	2.66	<0.001
Format x Method	AMC	Study	MIX	Flash	-31.0	2.66	<0.001
Format x Method	AMC	Study	MIX	Study	-7.2	2.66	<0.001
Format x Method	MIX	Flash	MIX	Flash	23.9	2.93	<0.001

[1]Least squares means
[2]Standard error of the mean
[3]Means difference
[4]Standard error of the mean difference

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Developing an Effective Course Syllabus

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Abstract

Throughout the 10-year span of a longitudinal research study in colleges of agriculture, professors were asked to share their course syllabi with the research team. It became an increasing concern across the decade that professors lacked definition, clarity, and uniformity in developing syllabi for their courses. In fact, the extremes ranged from an eloquently detailed 12-page document to no syllabus at all.

Recently, in preparation for The National Council for Accreditation of Teacher Evaluation (NCATE) formal review, a department chose to thoroughly examine, edit, and re-align all course syllabi with the current standards, and with each course in the department, to create a seamless articulation across levels and a uniform look across the department. This article highlights and offers examples of the standard components of an effective syllabus, so that professors across all disciplines have a guide for constructing course syllabi.

Introduction

It is important and fundamental that educators provide a framework for the course they will be teaching. Most often that framework is provided to the students through a course syllabus. For students, the syllabus provides security in knowing the direction and expectations for a particular course (McKeachie, 1978; 1999). There may be as well additional means by which instructors communicate information and convey expectations to students; however, the syllabus provides a written form of communication that lists responsibilities and sets goals for the course (Eberly, Newton, & Wiggins, 2001). "The syllabus is often the initial communication tool that students receive and is often the most formal mechanism for sharing information with students regarding the course" (Eberly, Newton, Wiggins, 2001, p.56).

"Despite the importance of a syllabus, the structures and formats of written syllabi tend to be handed down from one generation to the next, rarely considered as part of curriculum redesign" (Eberly, Newton, Wiggins, 2001, p.56). Eberley et. al (2001) further concluded that, "Nothing substantial drives syllabus construction. With the whirlwind of responsibilities surrounding the initiation of new faculty and development of new courses, syllabus construction becomes a minor task" (Eberly, Newton, Wiggins, 2001, p.71).

Given that a well-developed syllabus provides a sound framework for the course being taught, as well as security and direction for students, what steps can be followed in creating an effective syllabus? The National Council for Accreditation of Teacher Evaluation (NCATE) outlines a sound structure to follow when developing a course syllabus. Using NCATE criterion, the Department of Human and Community Resource Development (HCRD) at The Ohio State University is striving to meet the needs of students in the classroom by developing a uniform department-wide framework for all course syllabi. This article provides a thorough examination, and examples, of the elements contained in the HCRD syllabi, which can be used by professors in any discipline across colleges of agriculture to strengthen the effectiveness of their course syllabi.

Review of Literature:

Bers, et al. (1996), suggest that the integrity of a syllabus is important for administrative purposes because (1) syllabi are explicit public descriptions of courses, (2) they can and often are used as evidence in grievance and judicial hearings, and (3) they are used routinely to determine course equivalency in transfer situations. Because syllabi serve these functions, they form a contract between the student and the university.

According to McKeachie, the syllabus is organizational and centered around a schedule of assignments, tests, and topics (McKeachie, 1999). McKeachie also views the syllabus as a contract. He recommends that professors listen to student input and consider alternative ways in which students can achieve class goals. His assertion is that "students who have options and a sense of personal control are likely to be more highly motivated for learning" (McKeachie, 1999, p. 17). In addition, McKeachie (1978) contends that while instructors are developing the syllabus, they are forced to carefully consider the topics to be covered, the dates that assignments will

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be due, the dates that exams will be administered, and especially the objectives that will be reached (McKeachie, 1978).

When purposefully selecting the objectives that will be reached, the professor is focusing on learning rather than teaching, which requires a shift from an overview of what the instructor will teach, to consideration of what students need in order to be successful learners. The syllabus then is the first opportunity to introduce the learner-centered paradigm to students and to describe for them the roles and responsibilities that both professors and students share in the class (Diamond, 1997, p. ix). Allowing students to review the course syllabus and then offering input into its content, enables them to take part in its development, and therefore take ownership in their learning. Instructors must take advantage of this opportunity for student-centered learning.

Syllabus Construction

Contact Information

The front page of the syllabus contains contact information so that students can reach the professor or teaching assistant (TA) if they have questions regarding the course. The information listed should include, but is not limited to: the instructor's name, office address and telephone number, e-mail address, fax number, office hours, staff assistant contact information and teaching assistant contact information. An example of such contact information is shown in Figure 1:

Contact Information

Instructor:	M. Susie Whittington, Associate Professor, Agricultural Education
Office Hours:	Mondays, 3:00-5:00pm, or by appointment, please
Address:	203A Agricultural Administration, Columbus, OH 43210
Telephone:	(614)-292-4624
Staff Assistant:	Jackie Grueser, Room 203 Agricultural Administration
E-mail:	Whittington.1@osu.edu
FAX:	(614)-292-7007
Teaching Asst.:	Jana Hess, (614) 292-1354, hess.142@osu.edu, 250 Ag. Admin.

Figure 1

Course Description

Provide the course description for students so that there is an immediate clear picture of the course intent. Write a broad overview of the course that captures the nature of the course, but avoids specific details. Using active tense pulls the student into the present. Figure 2 shows an example of a course description.

Course Description

Examining the teaching and learning process with emphasis on planning and delivering agricultural instruction for agribusiness, extension, and the public schools.

Figure 2

Course Objectives

Incorporate the course objectives into the syllabus immediately following the course description so that students begin to get a sense of "belonging" because they see that the objectives will meet their needs in their program of study. Also, by placing detailed objectives in the syllabus, which is generally given to students on the first day of the course, students will be able to read the objectives, and immediately ask questions about the objectives for the course. An example of course objectives is shown in Figure 3:

Course Objectives

At the end of the course, students will be able to:

Use the Basic Principles of Teaching and Learning by:

1. Explaining each principle
2. Giving an example of each principle
3. Identifying situations where principles have been used

Figure 3

Standard Statements Included in a Syllabus

Construction of the syllabus will include the following statements according to NCATE criterion:

1. Off-campus field experiences
2. Diversity Statement
3. Technology Statement
4. Academic Misconduct Statement
5. Statement of Students' Rights

Figures 4 through 8 provide examples of these statements (other institutions may have specific statements).

Course Outline

The course outline is the heart of the syllabus and requires much thought, sequencing, and refinement across time. The course outline should include, at a minimum, each class date, the topic that will be taught each day, and the reading assignment that must be completed before class to adequately prepare for the session. Figure 9 is an example of the course outline (where "T" = "Tuesday" class meeting, and "R" = "Thursday" class meeting).

By providing a course outline, students preview the topic for each class period. They can then be fully

Off-Campus Field Experiences

All day each Friday and one weekend during the quarter, the pre-service teacher preparation curriculum will be enhanced by traveling in- and-out-of-the-state to further refine the learning outcomes desired for the students in this department. Students will meet the objectives of the field experiences by interacting with Ohio State University partners in non-traditional agriculture, and urban agriculture, and by teaching in diverse formal and non-formal educational settings.

Figure 4

Diversity Statement

1) Diversity enriches the educational experience by providing students with the opportunity to learn from individuals who differ from themselves.

2) Diversity promotes personal growth and a healthy society by challenging stereotyped preconceptions, encouraging critical thinking, and helping students learn to communicate effectively with people of varied backgrounds.

3) Diversity strengthens communities and the workplace by preparing students for citizenship in an increasingly complex, pluralistic society, and by fostering mutual respect and teamwork.

4) Diversity enhances the country's economic competitiveness by effectively developing and using the talents of all citizens (Diversity Action Plan, 2000).

Figure 5

Technology Statement

The instructor uses a listerv of students enrolled in the course to communicate important information, send necessary planning templates, and to clarify and/or receive assignments. Students enrolled in the course will use videotapes and VCRs, CD ROMs, email, PowerPoint, laptop computers, and projection equipment to enhance their learning in the course.

Figure 6

Academic Misconduct Statement

Academic misconduct of any kind will not be tolerated or permitted. If students have questions about what activities constitute academic misconduct they should consult Faculty Rule 3335-23-04. The procedures that will be followed, should suspected academic misconduct occur, will follow Faculty Rule 3335-23-14. In all cases of suspected academic misconduct: "The instructor will make every effort to inform the student of the allegation" (Faculty Rule 3335-23-14, #3A).

All assignments and examinations must be completed by individual efforts. It is expected that you complete each assignment on your own merit unless otherwise stated. Furthermore, it is not recommended that you share your resources if it can be construed to be academic misconduct. (http://oaa.ohio-state.edu/03hndbks.html)

Figure 7

Statement Of Students' Rights

"Any student with a documented disability who may require special accommodations should self-identify to the instructor as early in the quarter as possible to receive effective and timely accommodations."

If you need an accommodation based on the impact of a disability, you should contact me to arrange an appointment as soon as possible. At the appointment we can discuss the course format, anticipate your needs and explore potential accommodations. I rely on the Office For Disability Services for assistance in verifying the need for accommodations and developing accommodation strategies. If you have not previously contacted the Office for Disability Services, I encourage you to do so.

Figure 8

prepared to engage in scholarly discussion throughout the course. Consider including a statement that says, "Topics and the order will change as needs dictate". Since there are times throughout the course that an instructor may need to re-teach or review a topic, which would dictate a change in the course outline, adding this statement to the syllabus permits minor changes to be made to meet students' needs (with their prior knowledge of the potential for change).

Course Requirements

Students enter a new course with an immediate need to know the course requirements. Course requirements (Figure 10) include the title of the assignments and the number of points each assignment is worth. Notice in the example the amount of detail that is provided to the student. The "Unit of Instruction" assignment, and the "Micro-teaching" assignment are broken out into phases and/or sections so that students see the complete requirement. Students also immediately see the percentages, and thus the weighted importance the professor has placed on each requirement.

Course Evaluation

The course evaluation includes a brief description of the specific criterion the professor will use to evaluate each assignment. Also, the course evaluation emphasizes the due date, and restates the possible points earned for that assignment. Add a statement that lets students know that there is a formal process in place for their use in inquiring about a grade. An example might be, "If you have a question about the points you received for a particular item, email Dr. Whittington and state the specific concern." An example of a course evaluation section is provided in Figure 11 (note that this is the course evaluation for item 1c, "Unit of Instruction" in the Course Requirements listed above).

Course Outline

Class	*Topic	Reading Assignment
T 4/30	Group teaching techniques (I)	Ch. 6
R 5/2	Principles of teaching and learning	Ch. 2

Figure 9

Course Requirements

Assignments	Points
1. Teaching Assignments	
a. & b. Daily Teaching Plan 1&2	150
c. Unit of Instruction (complete and detailed)	200
Part 1 = 50	
Part 2 = 50	
Part 3 (complete) = 100	
2. Daily Reflections (18 class mtgs x10 pts. ea.)	180
3. Class Attendance and Participation	180
4. Final Exam	100
5. Microteaching	
a. Teaching (see lab syllabus)	625
b. Microteaching plans (5x100)	500
c. Microteaching self-critiques (6x6.7)	40
d. One-on-One video review	25
Total possible points	2000

Microteaching/Self-critique/Review = 34.5%
Daily teaching plans/Microteaching plans/Unit = 42.5%
Attendance/Participation/Reflections = 18%
Final = 5%

Figure 10

Course Evaluation

ALL ASSIGNMENTS MUST BE TYPED!

Spelling and grammar ALWAYS matter and are graded!

Component	Date Due	Points
Assignment #1c		200
Part I -	May 9	50
Part II -	May 21	50
Complete -	June 6	100

Assignment #1c will follow an outline for problem-solving teaching presented and discussed in class. It is designed as a true-to-life assignment that you will actually teach as part of one of your microteaching labs, AND that you will teach during student teaching. The assignment will be graded on **thorough completion** and timeliness. Specifically the unit of instruction will be graded on thoroughness of the "content" and "notes to self" (i.e. 1. Are there clearly written objectives with action measurable verbs and condition, criterion and performance? 2. Is there an interest approach that truly catches interest AND gives a "heads-up" as to where students are headed for the day? 3. Can it be taught in the time allotted?-- 4. Have ALL learners been given an opportunity to show that they have learned the material? 5. Is there a summary and a connection to where they are headed next?). You will include **a 100-point final exam** for the evaluation component of your Unit of Instruction. NOTE**--Can a "substitute" teacher teach this plan exactly as you intended using only the materials and directions provided by the plan? Make sure all overheads/handouts are labeled to correspond with directions given in the plan.**

Figure 11

Grading Scale

Students have the right to know how many points are needed to obtain a certain grade in the course. The grading scale, most often, is a university-wide standard grading scale (like the one below from OSU), or professors may be at liberty to develop their own scale. Figure 12 is an example of a standard grading scale adapted to points.

Textbook

The syllabus indicates the complete citation of the text that will be used for the course. If the book can be found on the World Wide Web at a reduced cost, share that information with students. Also, if there is more than one location in which students can purchase the text; indicate the location(s) that carry it (Figure 13).

Additional Readings

Other readings may be assigned throughout the course and therefore should be listed in the syllabus with full citations in case students want to locate them prior to the date that the topic is presented. An example of assigned readings is shown in Figure 14.

Conclusion

A syllabus becomes an integral part of a professor's course that encourages and supports the sort of interactivity and active, purposeful, effective learning that we want to promote (Diamond, 1997). Therefore, integrating the NCATE structure described throughout this article into a course syllabus will provide the framework and direction sought by professors and students, thus creating the contract that both parties desire, when the syllabus is provided to students and discussed with students on the first day of class.

Professors will want to analyze their course syllabi as "well-considered plans," in which they are willing to reinvent some of the structure according to the students and the situations they find in their

classes (Wlodkowski & Ginsberg, 1995). "Learning what students value in the syllabus will contribute to its usefulness as an instrument of education" (Eberly, Newton, Wiggins, 2001, p. 72).

Grading Scale

	%	points		%	points
A	(100-94%)	= 2000-1880	C	(76-74%)	= 1539-1480
B+	(93-90%)	= 1879-1800	C-	(73-70%)	=1479-1400
B	(86-84%)	= 1739-1680	D+	(69-67%)	= 1399-1340
B-	(83-80%)	= 1679-1600	D	(66-64%)	= 1339-1280
C+	(79-77%)	= 1599-1540	E	(63-0%)	= 1279 and below

Figure 12

Textbook

Newcomb, L.H., McCracken, J.D., & Warmbrod, J.R. (1993). Methods of Teaching Agriculture. Danville, IL: Interstate Printers and Publishers, Inc.

The textbook is available at Long's Bookstore on High Street.

Figure 13

Readings as Assigned

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Rothenberger, B.H., & Steward, B.R. (1995). A greenhouse laboratory experience: Effects on student knowledge and attitude. Journal of Agricultural Education 36(1), 24-30.

Figure 14

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It is Only about the Science

All too often faculty members of agricultural colleges miss obtaining grant funding, and the trend of low funding will proceed into the distant future. During this same time, annual review numbers will only "meet expectations" if funding is obtained, and the larger the grant the higher the annual review score. Reasons for this have been discussed in this journal previously, as have suggestions to make scientific progress (even) during the low funding periods. In order to make present faculty members whom lost grants and presently possess only small levels of grant funds, sold on the idea that progress is still possible, administrators at all levels must re-think how science might be conducted. Indeed, instead of the "individual investigator" grant being important, administrators need to re-align their thoughts towards "team" grant proposals being submitted, funded and projects conducted.

Team research efforts involve plenty of problems. However, they (also) may provide more effective solutions to basic and applied research problems. Moreover, team efforts make everyone in the team stronger [not weaker]. So, if one possess only a small amount of research funding, but provides an important element in a larger mechanistic problem/solution, it will soon be apparent just how efficient progress can be made.

Team efforts, whether in research (or in any effort), require a new understanding (by administrators) that 1) an individual scientist can develop as strong a reputation as any member of the team, 2) that individuals conducting team research efforts are capable of juggling numerous tasks at one time, and 3) that outcomes/impacts are more numerous. We are living during a time whereby few areas of research in the animal sciences are being fully funded. Albeit hard, the remainder of us still need to make some sort of scientific progress. Creating a team effort allows such to occur, re-energizes tired efforts and provides tangible outcomes that are more solid than that obtained by struggling individuals. Alternatively, individuals involved in the team effort must be assured that their efforts are only about the science. By thinking of the science, and making progress (even in small steps) team members will (actually) make more progress.

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Faculty Prerequisites for Dialogue-Based Education

Dialogue-based education has been slow to gain general acceptance among instructors in agroecology and organic agriculture, as elsewhere in higher education in agriculture. We facilitated a dialogue-based workshop in Lyon, France in August, 2012 with university instructors from 13 European countries to identify prerequisites for implementing this learning strategy. Results included a mapping of questions that teachers need to consider before launching a major modification of class procedures. We organized these into structural and personal issues to be resolved at institutional and individual levels (Lieblein and Francis, 2012), and conclude with specific recommendations on how to implement changes in classroom methods.

For more than a decade, we have explored how to use experiential learning in agroecology, using examples of complex and integrated systems on organic and biodynamic farms. Agroecology was defined as the ecology of food systems (Francis et al., 2003), and we focused on student-centered learning through steps on two related learning ladders (Lieblein et al., 2007), with the goal of learning and research for responsible action (Lieblein and Francis, 2007; Lieblein et al., 2012). The modern foundation for dialogue comes from the British physisist David Bohm (2004), and emphasizes an open, explorative and listening approach to learning. The principles of dialogue-based education have been summarized by Vella (1980) and described as transformative learning, or a means of popular education through participation.

"Dia" means "through", and "logos" translates as "meaning", thus a dialog creates a flow of meaning, and creates one way of taking energy out of differences and channeling it toward ideas that have not been created previously. Dialogue is a creative, multi-way mode of talking together between two or among more people, clearly different from a one-way lecture to transfer knowledge from teacher to student. Dialog initiates sustained collective inquiry that challenges the processes, assumptions and certainties that structure much of our everyday experience (Hannevig and Parker, 2012).

Assuming that change needs to start within ourselves, we facilitated an interactive workshop with 24 instructors from 13 countries, all currently teachers in European universities. We provided one key question, then time for individual reflection, and two methods for structured response. The question was: If we are to move from a linear mode of education to an education that is based on dialogue, then what would that require from us?

We introduced the concept of dialogue, in contrast to a linear mode of education based on knowledge transfer. A three-step process was introduced: five quiet minutes of individual reflecting and writing down ideas, an exchange of ideas in small groups, then discussion in a plenary session while we recorded issues on a white board creating a mind map of ideas. The guidelines for group dialogue included:

- Listen – without thinking about response.
- Reduce the urge to defend old positions.
- Be curious and suspend certainty and judgment.
- Abandon a need to hear only what you agree with.
- Ask: Am I willing to be influenced?
- Suspend a need for specific outcomes.
- Leave teaching roles and administrative positions outside.
- Slow down to allow for silence and reflection.

Based on discussion following these rules, groups chose three important issues to share in plenary session related to dialogue-based education.

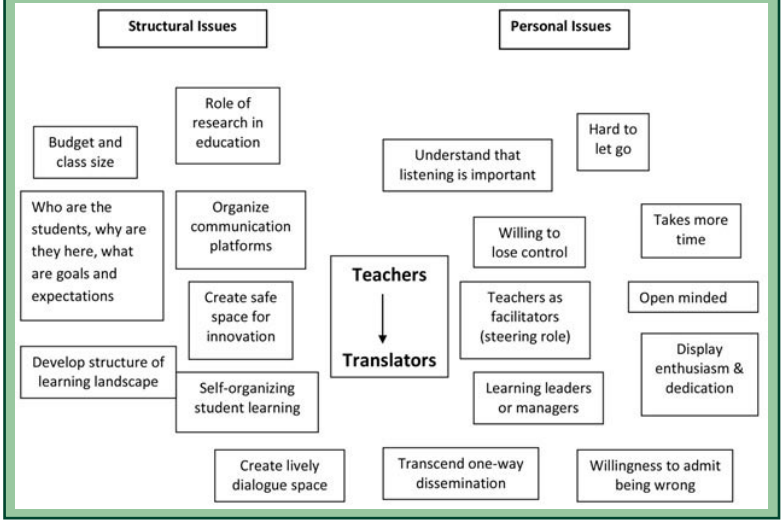
Workshop participants reported that a dialog-based mode of education will require us to make several changes to stimulate participation by students and infuse them with a sense of ownership in the learning agenda. As stated in their words, these changes would require that we:

- Train ourselves as teachers in dialog.
- Create a clear framework to structure dialogues and avoid superficial chatting.
- Give up overt authority over the learning agenda to empower students.
- Recognize prior experiences of students and what they bring to the group.
- Value humility, as a "learning leader" or facilitator, and give up the "sole source of knowledge" mentality.
- Be patient and respectful, clear and concise.
- Provide safe space for new and creative ideas, insist that everyone suspend judgment on new ideas, and encourage further exploration.
- Integrate new actors – policy makers, consumers, farmers – into the learning process.
- Drop conventional thinking about roles and positions.
- Move out of faculty "knowledge silos" and accept new roles as catalysts for learning.
- Become more open-minded and willing to take risks, showing a willingness to "lose control."
- Cultivate diversity in class and have discussion without reaching consensus.
- Create a lively and tolerant dialog atmosphere.
- Focus on the process of identifying and describing complex situations, without jumping to conclusions and priorities.
- Move the learning process toward exploring opportunities and visions.
- Find creative ways of enabling dialog-based learning with large student numbers and small budgets.

We later organized these into structural or university issues and personal or individual issues, as shown in Figure 1.

The structural organization of a class and activities may be more easily dealt with, although limited budgets, appropriate facilities, present infrastructure and administrative procedures may have to be overcome. Such issues likely can be resolved without posing a personal threat to instructors' integrity or questioning successful past performance. Issues include class size, available budget for off-campus activities and relating

Figure 1.



research more closely to education. On the other hand, issues such as willingness to "let go" and potentially lose a degree of control, called by some a pedagogy of no mercy (Freire, 2000), may be less palatable. To see oneself as an effective facilitator rather than as an authority figure could be threatening to an instructor's self-image and perceived status in the classroom, as well as in the academy in general.

In the plenary session we heard that perception of the value of dialog-based education is vitally important for a change from a linear mode of teaching to an interactive, participatory mode. If a shift is perceived as vital and necessary, this provides a platform for changes at the individual level – a move out of the comfort zone, give up some control, and easily accept multiple sources of knowledge. Some issues may be more threatening than others. It may be easier to become a good listener, find more time for planning, and be enthusiastic in class than to let go of authority and admit being wrong. When an individual shift has taken place, there are other ways of dealing with institutional barriers. When status quo dominates, then the structural, institutional barriers will be used as excuses for not making any changes in our personal approaches to teaching.

Dialogue-based communication as a foundation for creating an energetic and stimulating classroom and discussion-based learning environment has been explored in the Norway MSc course in agroecology, and also in several venues including ENOAT annual workshops. In each of the last five years, results of similar activities have been summarized in the workshop proceedings. Near-universal positive comments from participants about the value of dialogue-based interactions and projections of how these could be used to benefit student learning in agroecology and organic agriculture, apparently has not been implemented in other courses. We urge our colleagues to report on successes and frustrations with these types of methods, and hope the process will lead to new and creative learning environments.

As one participant summarized the experiences from this workshop:

"*At the beginning of the session I was just so tired after listening to all the presentations, and thought I had no ideas and nothing to offer. But after a while the ideas started to come and I had plenty of new ones and at the end I was full of energy and not tired at all.*"

Such a reaction articulates well the vision and rationale for dialogue-based education: creating empowered, energetic and knowledgeable students. Our main conclusion from this workshop and from conversations with individual teachers in the academy, is that the obstacles for moving towards this educational strategy include an uncertainty about methods and fear of losing control when moving from the comfort zone of the known to an unfamiliar and unknown approach. Giving the method a try in our classes can help remove these obstacles.

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Flipping the Classroom and Furthering Our Careers

Introduction

Lynda.com is an online learning website that offers video tutorials for a variety of topics and software programs. Subject matter experts create the course tutorials. While using the site is not free, many universities have purchased access for all students and faculty at their institutions, providing a valuable resource for learning. Even at institutions where access has not been purchased campus wide, there are educational options for courses and faculty development for purchase. Two basic uses of the site will be discussed. First is the use of Lynda.com to flip the classroom experience. Second is the use of Lynda.com for faculty members to learn new programs and skills.

Flipping the Classroom

The idea of flipping the classroom has been receiving a lot of attention lately. One example that has been very successful is the Khan Academy, which offers free educational materials. The concept of the flipped classroom is to allow students the opportunity to learn the material outside of class at their own pace and then be able to apply that information in class when the teacher is available to help. This contrasts with the traditional model of learning the concepts in class and then applying the material with homework when the teacher is not available to help. The benefit of this approach is that students are able to ask for help with specific questions regarding the content and the work they are trying to accomplish.

One benefit of Lynda.com for flipping the classroom is the wide variety of video tutorials and materials that are available. Some of the subjects include new media, career development, computer skills, data analysis, business, finance, and video, though the list of subjects available is much more extensive. Once students have access to the site, they are able to peruse the materials at their leisure. They first access the Lynda.com course, and they are then able to view multiple lessons that walk them through the materials. The lessons range in skill level and the time taken to complete each lesson. Some extensive learning modules are as long as 13 hours, while others can be completed in one to two hours.

If an institution has not purchased a site license for all faculty and students, Lynda.com offers an educational course option. The instructor can choose up to five Lynda.com lessons/topics to be used in the course. The institution can pay this cost for the student or Lynda.com can be set up for the student to login and pay for the course. This can be used instead of having a textbook. The cost per student usually ranges between $35 and $40, which is cheaper than a textbook in many cases.

Skill Development

While Lynda.com is a resource for enhancing the classroom experience, it is also a resource for faculty members looking to learn new skills and programs. There is a need for faculty members to stay up to date on trends in technology, and Lynda.com offers a means of doing so that is not as time intensive as going to live training sessions or scouring books for programs that are often costly.

Lynda.com also has the ability to take off some of the workload for teaching necessary technologies for graduate students to accomplish their tasks. Data analysis programs like SPSS that are commonly used have tutorials online that could help graduate students learn the programs in a structured manner that does not take away from the time of faculty members.

If an institution has not set up site licensing, an individual faculty member can purchase a yearly or monthly membership to access lessons and tutorials. Prices vary depending on the level of access and the length of commitment.

Conclusions

Please note that the authors of this teaching tip are in no way affiliated with or paid by Lynda.com. We offer these suggestions as a way for you to enhance classroom instruction and work on professional development related to technology based skills. In a busy world, Lynda.com offers solutions for instructors to flip their classrooms and/or improve their skills one tutorial at a time.

Submitted by:
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A Hint of Things to Come

When I retire from academia in a few years, I want to "go out" without any fanfare. No cake, no party, no presents and (I am hoping) no attention will be focused towards me on "that day." I just want to be capable of walking out the door of Clark Hall the same way I have done for decades: quietly, briskly and without turning around. By that time, my office would be cleaned of anything I wished to keep (very little). Moreover, I

foresee of nothing that would make me want to ask for anything....other than freedom.

Yes, I want to be free from mind-numbing meetings. You know the type. Meetings that could (in reality) be completed in twenty minutes, but that take two hours, or more. Also, I want to be free from always feeling like I am not doing my job. There is NEVER sufficient grant dollars for everyone, never enough publications, and never enough recognition for faculty members to suit administrators. Finally, I want to be free from indecision. It seems as though no one at the university level is quite capable of making decisions without convening a group (usually of their immediate friends) to provide consensus.

This leads to favoritism, leadership by a few and low morale in academic units. The low morale is compounded by the stress of possessing huge amounts of grant funding, and lack of rewards for doing what we are supposed to do best: teach our students and make them competitive.

Over time, I will miss the students–both good students and average students. Even with being a few years away from retiring, I know that I have impacted 20 to30 lives in such a manner as to make these (past) students into viable, contributing members of my discipline. Perhaps, I have made more of an impression on students I have taught for decades, but even if only one were made better by my teaching efforts my career is a success. With our world of academia changing due to political agendas, limitations of state and federal agencies, lack of competitive support, a changing population base, and world strife–to me, students will not change. Over the years, students have taught me things that have made an impact on my life, as well. The interaction will be missed. I only hope that the same might be said of my replacement, who will likely retire (someday) with a similar reality.

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

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The Global Farms Race: Land Grabs, Agricultural Investment, and the Scramble for Food Security

By Michael Kugelman and Susan L. Levenstein. 2013. Island Press, Washington, DC. Paperback, 237 pages, $25.00. ISBN 978-1-61091-187-0.

Massive transfers of land through long-term leases and to foreign management are taking place around the globe, often at the expense of subsistence farmers and pastoralists who do not have title to their land. National governments, corporations and investment fund managers clearly recognize that productive farmland and fresh water are quickly becoming limited and food will be the most important commodity in world commerce. *Global Farms Race* explores this major phenomenon and delves into the economic, environmental, financial and social implications of foreign control of this vital production resource.

How large is this neocolonial acquisition of land use? Many negotiations are clearly not publicized, but estimates from the International Land Coalition suggest that over 200 million hectares have been leased since 2000, and Oxfam reports a similar figure with most transactions taking place since 2008. This is an area equivalent to all the farmland in Western Europe. Among the ten largest land deals are one that includes six million ha offered by Mozambique to Brazil in 2011, and just over one million ha from Madagascar to Daewoo from Korea in 2009, a negotiation that was suspended due to massive protests that toppled the government. The primary stated reason for leases is food security, and the crisis accelerated during the spikes in food prices in 2008 and again in 2011. More people are becoming aware of this activity as non-profit watchdog groups explore the details and bring them to light. This book is another contribution to transparency.

Over centuries there has been exploitation of other countries' resources, since Roman times, through military occupation and colonialism, absorbing neighboring countries, capture and transport of slaves, or domination of trade. Rapid industrialization in the global North and rising standards of living created demand for food and raw materials, stimulating investment in tropical areas that produced plantation crops of coffee, tea, rubber, and sugar for export. These were often planted at the expense of food crops for local consumption. The current land leases are a result of a "perfect storm" of escalating food prices plus scarce land and water, as well as lax national policies and potential for individual greed. This will only accelerate as incomes rise in first and second world countries where people seek more protein in their diets and a higher degree of food security. It is clear that income and monetary differences are increasing between rich and poor, both within and among countries, and this buying power complicates and reinforces the acquisition of land to assure food supply for those with money. Farmers or pastoralists in developing countries without clear title or other legal possession of their land are susceptible to government decisions that force them from their farming fields, grazing lands and communities.

Direct foreign investment in land that takes this vital resource away from the poor may appear justified in the name of accelerating agricultural modernization and improving farming systems, as well as potentially providing both new jobs and more food. Numerous obvious flaws in this reasoning have been manifest in many such agreements. It is obvious that national or personal interests of investors to supply food to their own countries will take precedent over altruistic motives of improving local development or equity of benefits that includes the local population. Although these financial arrangements may bring needed foreign exchange to local governments or personally to officials, they are unlikely to filter down to the rural population other than providing minimum wage jobs. Most land deals appear to result in even more economic inequities.

What solutions are proposed to alleviate these problems resulting from land transfers? In a chapter on social and economic dimensions, a series of recommendations for national policy emerge:

- Create a national agricultural vision that respects human rights
- Build ecologically sound and resilient farming systems
- Protect the space for local priorities
- Understand complexities of land use and land pressures
- Design investment to fit broad development objectives

These policy initiatives must be coordinated with concerns about environmental impacts of land use changes that influence what crops are grown and the

management practices that dominate a new agriculture. How will larger field size and reduced biodiversity impact the sustainability and resilience of production? How much of the food produced will stay at home, and how will ecosystem services be affected by consolidation of field and homogenization of the farming landscape? Many of these questions have not been resolved nor even considered by national governments that are in the midst of land use change.

The subtitle of *Global Farms Race* describes the motives and dynamic nature of this movement: *Land Grabs, Agricultural Investment, and the Scramble for Food Security.* Editors Kugelman and Levenstein have assembled a series of well-researched studies by highly-qualified experts in economics, policy, finance and the environment. There are useful chapters on Africa, Asia, Latin America and Central/Eastern Europe and Former Soviet Union. The concluding chapter includes recommendations for investors, for host governments and for the international community. There are optimistic projections for how this investment in farming could benefit host countries. But realistic questions are absent about whether this will really happen in a globalized economy, and it is likely that land leases by foreign entities could result in accelerated extraction of food and resources in a new form of economic or agricultural colonialism. The book concludes with useful additional data tables, with web resources, and with specific notes and references to each chapter. This is a valuable chronicle of the current situation in changing land use, and brings together data from multiple sources that are often not easily accessed. It is a timely and useful resource for courses in agricultural development, in economics and policy, and in political science. The data is current, and the analyses put into the context of present challenges especially in the third world.

Submitted by:
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Consulting the Genius of the Place: An Ecological Approach to a New Agriculture

By Wes Jackson. Counterpoint Press, Berkeley, California. 2010. Hard cover, 272 pages, $26.00. ISBN 978-1-58243-513-8.

"As our minds sweep over the past and back to the present, I want them to center on the natural ecosystems still with us as our primary teachers. They are our source of hope" (p. xi). With his elegant writing and succinct prose Wes Jackson enumerates and describes the problems of industrialized agriculture. Dr. Jackson has sounded a rallying call for farmers to embrace a more sustainable way of producing our food. In *Consulting the Genius of the Place* he synthesizes the evolution of our thinking through his own career as a farmer, geneticist and plant breeder, and presents the case that farmers must pursue a paradigm shift by looking to nature as the measure in all that we do.

In *Some History and Assumptions*, the book provides context to the reader on how the author came to conclusions described in this book. We are reminded that our rapid consumption of the planet's finite carbon resources (soils, trees, coal, oil, natural gas) and proliferation of things we make with those resources are costing us the renewable part of our ecosphere. Renewable systems fueled by contemporary sunlight; filtering air; capturing, transporting and storing water; and recycling nutrients will provide our food security in the post fossil-fuel era. We can ill afford to abuse these ecoservices. The author describes control over nature as the dominant view in our time, a problem we must move beyond to reach sustainability. He maintains that the charge must be led by agriculture.

The foundation of Jackson's thinking comes from personal experiences of his growing years in two distinct ecosystems. In the South Dakota prairie he observed an ecological determinism where ranching systems will not endure if the vegetative structure of the native prairie is not respected. Conventional crop farming techniques introduced into this fragile ecosystem will result in hemorrhaging of ecological capital through loss of sediment from the topsoil, nutrients carried off the land and reduced biodiversity that helps keep a system intact. In contrast, back home in the Kansas River Valley he encountered a more forgiving place for traditional agriculture, with deep and fertile soils, as well as adequate rainfall to produce a crop each year plus the residue in biomass left behind that could sustain a reasonable level of soil fertility for the next year.

In large part through his discovery of the writings of Aldo Leopold, the stark contrasts between human farming systems and natural ecosystems became clearer to Dr. Jackson. He then realized that natural systems were diverse, recycled nutrients, stored water for plant growth, and existed on current sunlight energy, while homogeneous monoculture farming systems produced waste, required additions of fertilizer and protection by pesticide applications and were highly dependent on fossil fuel energy. Here Jackson recognized an unfilled niche in the array of possibilities for agriculture: creating perennial polycultures in nature's image for production of seed and forage. It was a small step to decide that perennial grains and legumes would be the foundation of

this new system, and he launched a long-term research program to realize the potentials of this new dream.

Along the way, Dr. Jackson drew encouragement from his friend Wendell Berry from Kentucky – poet, farmer, rural community advocate – who introduced him to the concept of "nature as measure" and how this has a history in human thought. Harmony between humans and nature as a central theme in poetry virtually disappeared with the rise of Romanticism, replaced by centralization of the human mind. Nature as measure did survive with the work of thoughtful practical botanists such as Liberty Hyde Bailey at Cornell and organic farming proponents such as Sir Albert Howard working in India. It is time to revive that tradition, according to Jackson, and form a marriage between the disciplines of ecology and agriculture, two fields that have taken different paths for the last century. In Chapter 3 he makes the case that the earth is a living organism, or a "supraorganism", that is larger than the sum of the components and larger than humans in time and inclusiveness. It is more complexly organized and has greater evolutionary potential and creativity. This realization changes how we must observe and conduct ourselves in the world. Experiments by William Noll at University of Nebraska in 1934 showed that a prairie compared with an adjacent wheat field was far more effective at retaining moisture and regulating temperature, critical elements needed today as we likely move into a period of extended drought. The author contrasts this with the Brazilian rainforest where nature has adapted a way to rapidly transpire and evaporate water into the atmosphere. Following our human desire to exploit success anywhere we would like, even without considering conditions or consequences, we have decided to plant monoculture soybeans in both these locations. Such a practice totally ignores the uniqueness of place and its potentials for unique systems.

Nearly all of earth's biotic community is dependent on carbon as a fuel source, described in Chapter 4. Humans draw from five major finite pools: soil, forest, coal, oil, and natural gas. Although we have been consuming these resources since the advent of agriculture, only in the last 300 years have we substantially dipped into the three pools of fossil fuels. This has accelerated our potential to produce food and to reproduce ourselves, depleting the reserves of non-renewable energy sources and causing major changes to the total ecosystem through global warming. Jackson insists that we must be the first species to practice restraint in resource use in order to assure our own long-term survival.

There is no question that technology combined with our human cleverness has led to fossil fuel-subsidized increases in yields of the major cereal crops over the past century. However, this process has relied on the residual fertility of the prairie, and has a fortunate coincidence with inexpensive petroleum products and relatively benign and consistent rainfall and temperature regimes. This situation is rapidly changing. In *Analyzing the Resistance* the author explores why we as a society do not recognize the challenges, continuing to believe what we want to believe, including the massive advertising by input companies that yet another technology will solve everything. He cites the successes of the auto industry as well as the energy industry in resisting regulation and change in spite of the evidence and need for efficiency and environmental protection. In the Great Plains he illustrates the continuation of an extractive mindset and economy brought with our European ancestors that progressed from mining the bison for hides and bones, the grass for cattle, the gas and oil for transportation and farming, the soil for extending crop production into marginal areas and now fossil water to irrigate thirsty crops not adapted to the region.

What are the alternatives? In *Consulting the Genius of the Place* Jackson examines current systems and contrasts them with what is taught by the prairie. He makes a compelling case for perennials on the prairie, and the opportunities to combine them in polycultures that mimic the native ecosystem. He reminds us that grains are what keep us alive, and that perennial grains when mixed with legumes can help keep the prairie alive as these complementary species provide a resilience that is impossible with monoculture. Jackson discusses the successes achieved over more than three decades with a number of species that now combine relatively good yields with perennialism. One current thrust is to design combinations of species based on ecological principles that will combine grain and forage production and result in economic yields of both. He answers several frequent questions that are raised about such unique agroecosystems, and how they hold potential for the future. He concludes with a proposal for a 50-year farm bill that would greatly accelerate perennial cropping systems research as well as begin a systemic change in agriculture in this country. This link of research with policy is a unique feature of the book, an element that is rarely found in our scientific literature in agriculture.

In summary, we are moved to suggest that for serious students of the prairie who seek ways this ecosystem can be transformed to producing food through perennial polycultures, while maintaining ecological integrity; it would be wise to seek the counsel of a "genius of that place." Author Wes Jackson clearly demonstrates in this book why he was chosen as a recipient of a MacArthur Foundation "genius award" in 1992 for his innovative research and co-founding of The Land Institute near Salina, Kansas.

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The McDonaldization of Society, Seventh Edition

By George Ritzer. Sage Publications, Thousand Oaks, California, U.S.A. 2013. 248 pages, paperback, $45.00, ISBN 978-14522-22669-9

Few institutions in contemporary U.S. food culture in the U.S. are as well recognized, as successfully franchised and copied, and as frequently reviled as McDonald's fast food restaurants. The expectation of purchasing highly repetitive food seems irresistible to the contemporary consumer in this country. Slick marketing to children through "happy" meals and adjacent playgrounds only adds to success. Customers appear to be both tranquilized and almost fatally attracted to this management model of efficiency, calculability, predictability and control. And many other companies have pursued similar strategies.

Eminent academic and sociologist George Ritzer of University of Maryland celebrates the 20th anniversary of the first edition of his landmark book on U.S. marketing and culture of food with this new seventh edition of his popular book, an articulate commentary on much more than the McDonald's drive-through establishments. To expand on the model, increased efficiency means that a customer arrives, orders, throws money in the window, collects "food," and even carries away the trash. Calculability is determined when a customer knows what they get and about how much it will cost, also convinced that "bigger is better." Predictability is created when a customer visits a new location and is rarely surprised by what they get, whether in Portland, Oregon or Portland, Maine. Control is essential to the management model, and this extends from massive contracts with a few suppliers where the company can exert maximum pressure to lower their purchase costs to the routinized activities of employees delivering the food. Everything is controlled and predictable.

A prominent copycat corporation is Ikea, providing a vast range of furniture and other items for the house that appears to fully embrace McDonalization. Efficiency is built into the system to benefit the corporation by small number of employees needed to run the stores. Calculability is in the customers knowing the exact process to obtain the goods offered for sale. Predictability is anticipating that all items will be available in flat boxes ready to load into the family hatchback or SUV and will be easily assembled with a simple Allen wrench. Control is exercised by funneling customers through a warehouse-style big box store where they are exposed to hundreds of additional items displayed in a cozy and friendly room-style arrangement that provides attractive context and incentive to buy before ever reaching the registers to pay. The approach is compelling, and will certainly be copied by others.

To further explain how the industrial process deals with employees, author Ritzer likens workers to robots and describes their transformation from highly-skilled specialists to cogs on a production line. Butchers were respected and well paid, but today's low-skilled workers on the meat line repeat the same job thousands of times per shift. This Henry Ford assembly-line model makes each job as simple as possible, thus requiring little investment in training. Extended to housing, carpenters move from site to site performing simple and repetitive tasks and that is all they do.

In a nauseating description of the Holocaust, the same principles of efficiency and repetition were applied to a mass extinction of human life. A gripping account of Nazi experiments recalled how they discovered that bullets were not efficient, and that grouping people in closed chambers and applying poison gas was more cost-effective. Victims were dehumanized, and massive numbers of people were eliminated as quickly as possible in routines that today seem unimaginable. It is difficult to read, but this account of perverse human behavior provides an unforgettable example of one consequence of the industrial model.

Close to home for academics is the description of higher education as a McDonalized system. From design of classrooms to delivery of information, then on to evaluation Ritzer describes the evolution of testing systems. Universities originally required oral examinations to help professors determine the amount of information students had gained during the class, assuming that this lower order metric was most important in learning. As number of students increased, the use of essay questions became more widely used. This allowed each instructor to have larger classes and test students more quickly. Even this became prohibitive with ever-larger classes, and testing moved to multiple choice, true/false, and short answer questions where students recorded their bubble sheets in a "factory-style" mode of evaluation. This way a large number of students could be "processed" as efficiently as possible. Calculability allowed the instructor to know how long grading would take, and predictability allowed students to anticipate the form of exams. Instructors exerted control over the entire class and his/her own schedule by reducing the

amount of time required to prepare and grade exams. Current textbooks for large classes now come with pre-designed pools of questions that can be quickly assembled, and just as quickly changed each semester to avoid the dangers of students preparing for exams entirely from fraternity test files. The applications of this "modernization" to the academic process certainly stimulate us as concerned educators to dedicate more time to envisioning and testing higher-order learning and how this can be effectively evaluated in an era where accumulation of student credit hours continues to be a modal but misguided metric for assessing effectiveness of a teacher's performance.

The same themes are applied to much of modern U.S. culture, from the cookie-cutter motel chains that provide a promise of clean beds, friendly people at the front desk, and plastic food masquerading as "free breakfast" to the ubiquitous shopping malls that present a sameness of appearance from coast to coast with the same shops providing the same merchandise. Even childbirth has become McDonalized, since more physicians than midwives now deliver babies, and Cesarean sections are indiscriminately used for convenience of doctor and mother. Even gender can be determined through sperm screening, thus increasing likelihood of the desired sex of the next child. The multiple examples provided through the book include contemporary parallels such as Starbuckization and eBayization, updates in the new edition that make this book meaningful to the current generation of students.

Some antidotes to McDonaldization are suggested with advice on how to counter this current trend. When traveling, the author recommends seeking locally-owned bed and breakfast alternatives that are family-run and cycle most revenues within the community. Owners often live on the property, and have a personal touch. They can recommend nearby locally-owned restaurants whose owners share their philosophy and dedication to the local economy, including slow-food establishments that may serve food produced nearby and demonstrate concerns for the environment. He further suggests avoiding large chain-style companies of all types, using cash for purchases, watching as little television as possible, and avoiding routine in one's everyday life.

The McDonaldization of Society in its several editions has been translated into more than a dozen languages, and hopefully has exposed the negative extremes of this model to a wide international audience. George Ritzer is a prolific author of several key texts and popular books on sociology, as well as the editor of the *Encyclopedia of Social Theory* and the *Encyclopedia of Sociology*. His book is highly recommended to thoughtful readers, young and old, as an exposé of the downside of our present consumer society as well as insight on how to avoid the standardization that is coming with globalization.

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NACTA Presidential Remarks

Jeffory A. Hattey
June 28, 2013

As NACTA President for 2013-2014 I would like to begin by thanking the outstanding efforts of the Virginia Tech and Conference Host Committee, led by Dr.'s Rick Rudd, Jim McKenna, and Pavli Mykerezi. You have done an outstanding job organizing conference events at a number of wonderful venues. The exceptional success of this conference begins with support from leadership. I would like to thank Dean, Alan Grant and Associate Dean, Susan Summer of the College of Agriculture and Life Sciences at Virginia Tech University. Their strong support of this conference was instrumental to the success.

A conference of this magnitude also needs financial support and NACTA would like to graciously thank the industry and agency sponsors who supplied many of the Virginia products we had the pleasure of consuming this week.

I would also like to thank you, the participants of the 2013 NACTA Conference. You make this an enjoyable an rewarding week each year.

This is a great time to be a part of NACTA. At the 2013 Conference, we have the most participants in the history of this organization. There is representation from across the U.S., Canada, Puerto Rico, Peru and other countries. This year, was the largest number of submitted abstracts and we have continued our strong partnership with NIFA-DOCE, bringing together teachers from a wide range of scientific disciplines from a broad spectrum of institutions.

What is NACTA about?

NACTA is about Crossing Disciplinary Boundaries. Teaching and learning is the discipline at a NACTA conference and the subject each of us teach is secondary to how we create a safe learning environment, communicate, and cultivate learners. This week, we have learned to look at the world through different lenses: cultural competency; agricultural production; flipping our classroom or flopping on a new strategy; or finding a friend to Pintrest on our iPads. We look though these lenses for a common goal, to teach students how to become learners. We come together each year to encourage, challenge and educate each other in our common commitment to our craft and chosen profession.

NACTA is about recognizing excellence. Each year we gather to recognize excellence in education. Approximately 50 USDA award winners have come from the ranks of NACTA membership. Excellence does not have any age or experience boundaries. Excellence is found in: a lifetime of commitment as lived out by Ron Hanson; the exuding energy of Nick Fuhrman; the humble servant attitude of David Jones; the lifetime of learning demonstrated by Jim McKenna; the caring attitude of Samantha Ambrose a graduate student who invests in the lives of fellow students; the joy of spending time with students I have seen in Martin Zuidohf; the passion to teach of Kevin Donnelley; the professionalism of Foy Mills; and to setting the bar high as done by Kirby Barrick. We come together each year to celebrate those who have committed to changing lives.

NACTA is about changing lives. As educators, we are in the business of changing lives one person, one relationship at a time. Each of us brings a different discipline to the table but what cuts across our disciplinary boundaries is a desire to be a catalyst which changes a

student from being a passive observer to being an active participant in their education.

We never know when that moment of catalyst will occur so as teachers we must always be prepared. We are always on the clock even when we are in the check-out stand at in our tee-shirt, shorts, glasses and ball cap. A poignant reminder of the impact we can have in the life of a student was in an email I received from a former student just two days ago while preparing this message.

"Dr. Hattey,

I hope all is well! The other day I was thinking about you and your Fundamentals of Soil Science course back at the real OSU [Author note, I am currently at The Ohio State University].

That was the first course I took after switching my major to environmental science, and I have to say I think it changed my life! Haha!

In those days I really didn't know what environmental science was, or soil science for that matter. Anyway, I remember you introducing us to the idea that carbon stored in Arctic permafrost could be decomposed and released to the atmosphere as GHGs in a warming climate. I remember thinking that that was the coolest thing I ever heard and it would be really interesting to research something like that.

So now, four years later, I've just completed my first year of an Earth System Science PhD program at University of California Irvine and am preparing for my first field campaign to the North Slope of Alaska, which begins in a month. I'll be sampling methane emissions from thermokarst lakes at 72 degree latitude. I plan to analyze the methane's radiocarbon content in order to estimate the age of its carbon source. It's amazing to me to think back four years to your class and remember the first time I thought about conducting research in the Arctic- Now it's becoming reality!

Anyway, I just wanted to thank you for the inspiration you gave me while I was at OK State. Your guidance and advice was greatly appreciated and I think it really helped me pursue the work that I am most interested in. Keep up the good work you do for all your students!

Best Regards,

Clayton E."

I remember the lecture Clayton referred to, in an unscripted moment, I made the offhand comment that if global warming models were correct, then the organic matter locked for centuries in the Artic, would be at risk of escaping into the atmosphere contributing to greenhouse gas levels. What was an offhand comment on my part resonated with Clayton impacting his career path.

I am sure every teacher in this room has a file where you keep letters or emails similar to Clayton's. These are reminders that as educators, we can be a catalyst in the lives of students. What you do makes a difference and NACTA exists to support your impact in the teaching profession.

What is NACTA to You?

I hope for each of you, NACTA is or will become the organization that encourages, challenges and inspires each of you to continue to invest in the lives of the students and colleagues you work with. There is a place for you to contribute in NACTA. We are an organization that is open to new members who are ready to contribute. Join a committee or volunteer to be a reviewer, NACTA is what you make it. We are here to serve those who aspire to excellence in teaching and learning and desire to change lives.

In 2014, I invite you to meet me in Montana where "Learning Runs Through It." Thank you and Safe Travels.

Secretary's Report

June 2013

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

A NACTA E-Newsletter using the administrative side of NACTA allows for more flexibility.

Membership notifications go out through email to individuals in the fall. If dues are not paid by the end of February of the next year, their name is taken off the mailing list. Members receive at least two personal reminders for membership renewal. Payment can be taken by credit card on the NACTA membership website with PayPal, or mailing, faxing or calling the NACTA Secretary. Checks can also be taken. We also now have the ability to bill and receive payments through Quickbooks (Intuit). Members continue to take advantage of the 3-year payment option. Every renewing member receives an email thanking them for their renewal. Every new member receives a letter welcoming them into NACTA and their name is passed on to the Regional Director and Membership Director. The NACTA Secretary appreciates the involvement of the Membership director and the Regional directors to encourage renewals for general memberships.

There are approximately 780 members of NACTA – paid for 2013 - which includes individuals, institutions, and libraries. This includes 57 graduate students, five new Life members, and 58 new members from the University of Wisconsin-River Falls conference. In total, we have about 200 new members this year but approximately 200 did not renew for 2013 - many of them long time NACTA members.

A number of universities/colleges promote NACTA memberships and pay for either a one or three-year membership for individuals. In addition, some schools' departments pay for some faculty NACTA memberships on a yearly basis. Those that have participated this past year are: Texas A&M University, Commerce, Pennsylvania State University; Redlands Community College, OK, University of Illinois, Virginia Tech, Purdue University; University of Florida; University of Nebraska; Sam Houston State University, Huntsville, TX. For the record, if you are aware of some that have been missed, please inform the Secretary.

We have three new Institutions – North Carolina A&T University, University of Alaska, Southeast and York Technical Institute, York PA. There were several smaller institutions that did not renew for 2013. We have not been able to obtain renewals for Oregon State University, Arizona State University and Eastern Kentucky University. If you are aware of Dean/ leadership changes, the secretary would appreciate the updated information.

We have three new schools due to the NACTA Judging contest – Garden City Community College, KS, Houston Community College, TX and Oklahoma Panhandle State University, Goodwell. There were fewer colleges that did not pay their Institutional memberships this year in connection with the Judging Conference. Derek Dick has been very good to follow through with reminding these schools about payments to NACTA.

We have six Canadian members, six Canadian Institutions and two Canadian libraries. We have two foreign members, and three foreign libraries.

All member institutions received notification by email of their ability to present the Teaching Award of Merit Certificates and other advantages of Institutional membership. This year 50 Teaching Awards of Merit and 13 Graduate Student Awards of Merit were presented. This is a few more than last year. **How can we make them more aware of this award?** This information is available on the NACTA website. There were several current NACTA members that received this award.

We need to encourage more Online voting of NACTA officer positions.

Action Item: Encouraging new memberships and retaining memberships is an ongoing theme. Why did 200 members not renew for 2013?

Submitted by:
Marilyn Parker
Secretary
June 2013

Treasurer's Report

Marilyn Parker
June 2013

Below is a profit and loss statement created by QuickBooks. The accounting firm of Anderson, Arritt, Robins & Waters, in Burley, Idaho, conducted a compilation of the financial records of NACTA to verify the records. A detailed Profit & Loss statement is available for any NACTA member.

The membership dues are the major factor in keeping NACTA financially viable. In order to totally support the annual teaching awards, the current membership would need to double. The increase in dues in June 2007 put NACTA in the black in 2008-2009.

Increases were in Conference income from the silent book auction, royalties and manuscript page charges.

Additional monies have been spent for secretarial help for Journal, conference preparation, website up keep and accountant help. Scanning of all historical records and memberships continues.

Registration for the pre-conference event brought in about $3225 but the costs will be $3600 - $1600 for Dr Lincoln's expenses plus her honorarium of $2000.

To keep NACTA in the black, it is critical that current membership's levels be maintained or preferably increased.

The bank statement for the checking account ending in May 2013 is $52,022.

Submitted by Marilyn B Parker
NACTA Secretary/Treasurer
June 2013

North American Colleges & Teachers of Agriculture
Statement of Receipts, Disbursements and Members' Equity
For the year ended May 31, 2013

Receipts		
Membership dues	$	62,396
Royalties income		354
Foundation awards		4,000
Position announcement		550
Conference income		1,979
Miscellaneous income		1,475
Total Receipts		70,754
Disbursements		
Award		4,600
Conference expense		4,711
Credit card fee		1,437
Honorariums		24,134
Insurance		150
Journal miscellaneous expense		2,340
Journal printing		7,769
Miscellaneous expense		1,006
Membership refund		525
Postage		1,409
Professional fees		2,972
Fall meeting		662
Secretarial		4,015
Supplies		878
Travel		3,869
Website expense		6,645
Total Disbursements		67,122
Excess receipts over disbursements		3,632
Beginning balance 6-1-12		48,390
Ending balance 5-31-13	$	52,022

NACTA Business Meeting Minutes

June 28, 2013
12:45 to 1:30 pm
Skelton Conference Center, Virginia Tech

The Business meeting was held at the end of the Friday noon luncheon. There were approximately 175 in attendance.

President Rick Rudd called the meeting to order. First time NACTA Conference attendees were recognized. NACTA Executive Committee members introduced.

Reports presented:

- ✓ Secretary /Treasurer Marilyn Parker indicated that PayPal is available for paying memberships online; encouraged NACTA members to vote online for officer elections; we have five new Life members of NACTA and 57 graduate student members which is higher than usual; turnover of about 200 memberships this year; we still need to increase awareness of the Teaching Award of Merit Certificates – 64 given out this year; nine institutions have paid for NACTA memberships for their faculty; three new institutions this year – NC A&T University, University of Alaska, Southeast @ Sitka and York Tech Institute, PA; amount in NACTA checking is $52,000; there was an increase in monies earned from book sales from last year, royalties and manuscript page charges but additional monies have gone out for secretarial/website upkeep, conference preparation and accountant help; financial records were compiled by the accounting firm of Anderson, Arritt, Robbins & Waters, CPA's; the financial report will be in the September 2013 issue of the NACTA Journal. It was moved and seconded to approve the Secretary's report. **Motion passed.**

- ✓ Editor Rick Parker stated that there have been double the manuscripts submitted; these have increased each year; 32 manuscripts submitted for the international issue; encouraged Teaching Tip submissions; encouraged themes for NACTA Journal publications; good response from the Editorial Board with 50 institutions being represented; those presenting were asked to submit their oral and poster presentations to post on the website; new format for Journal being considered.

- ✓ Membership/Public Relations Ron Hanson announced the names of the new NACTA Life Members; thank you to schools that pay NACTA memberships for their faculty; NACTA Campus Ambassador program had many volunteers respond (seven within the first few minutes of the email being sent) with a total of 27 total responses; information paper on the luncheon table is to encourage NACTA memberships.

New Business

- ✓ President Rick Rudd encouraged members to vote
- ✓ Thank you to Secretary for her work.

Election Results presented:

- ✓ Incoming President – Jeff Hattey, The Ohio State University
- ✓ President-elect – Bonnie Walters, University of Wisconsin, River Falls
- ✓ Eastern Region Director-Elect – Lurline Marsh, University of Maryland, Eastern Shore
- ✓ Southern Region Director-Elect – David Jones, North Carolina State University

Committee Chair and Liaison Appointments

- ✓ Teacher Recognition Chairman will be Nick Fuhrman for 2013-2015

NACTA Business Meeting recessed by Rick Rudd

NACTA Foundation meeting opened by Advisory Council Chair Jeannette Moore

Jeannette requested Kevin Donnelly give financial report for the NACTA Foundation from the University of Wisconsin-Platteville. Kevin presented the numbers:

- ✓ Current amount in spendable account - $12,150
- ✓ Endowed permanent fund originally deposited - $101,251
- ✓ Market loss through FY 2012 - ($12,503)
- ✓ Market gain to date FY 2013 - $12,921
- ✓ Administrative fee to UWP - $1,933
- ✓ Distribution to spendable - $2,465
- ✓ This all means that we have a net market value as of the report that is within about $4000 of the original amount deposited, and $12,150 to spend.

NACTA and NACTA Foundation are two separate entities. All numbers for the NACTA Foundation were approved by the CPA.

NACTA Business Meeting reconvened

2014 NACTA Conference at Montana State University presentation

- ✓ 60th Anniversary for NACTA
- ✓ Theme is "Learning Runs Through It"
- ✓ Video presentation
- ✓ Information shared about Montana State University
- ✓ Travel to Bozeman is relatively easy since it is a vacation destination

President Rudd encouraged conference participants to look through the silent auction books being offered as the auction will end at 2:00 pm.

Business meeting adjourned at 1:30 pm.

Mark Your Calendars Now!
June 24 - 28
2014 NACTA Conference

"Learning Runs through It"
Montana State University, Bozeman

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Join 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, Teacher Fellows, Regional Outstanding Teacher Awards, NACTA-John Deere Award, Teaching Award of Excellence, Distinguished Educator, and Graduate Student Teacher Awards.

Membership Categories (circle one):

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

To join complete the following form.

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

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

Name on Card: _____

Card Number: _____

Expiration (month/date): _____

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

Send your completed form to:

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

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

NACTA Committee Members 2013-2014*

Journal Awards
Neil Douglas, Chair
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Neil_Douglas@berea.edu

Membership & Public Relations
Ron Hanson, Chair
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Educational Issues & Teaching Improvement
Kimberly Moore, Chair
University of Florida
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NACTA Teacher Recognition Committee
Nick Fuhrman, Chair, University of Georgia
Grace Arman-Agyeman, SW MN St University
Kirby Barrick, University of Florida
W. Stephen Damron, Oklahoma State University
Sam Doak, Virginia Tech
Kevin Donnelly, Kansas State University
Jean Gleichsner, Fort Hays State University, KS
Kelsey Hall, TX Tech University
Lynn Hamilton, California Polytechnic State University
Alan Hansen, University of Illinois
Ronald J. Hanson, University of Nebraska-Lincoln
Cindy Haynes, Iowa State University
Jennifer Henke, University of California
Robin Peiter Horstmeier, University of Kentucky
Dann Husmann, University of Nebraska-Lincoln
Donald M. Johnson, University of Arkansas
David Jones, North Carolina State University
Prasanta Kalita, University of Illinois
Angela Kent, University of Illinois
Thomas Kuzmic, Oklahoma State University
Mickey Latour, Southern Illinois University
Lurline E. Marsh, University of Maryland
Ed Miller, Oklahoma State University
Foy Mills, Sam Houston State University
Jeannette Moore, North Carolina State University
Tory Parker, Brigham Young University
Nick Paulson, University of Illinois
Greg Pillar, Queens University, NC
Bryan Reiling, University of Nebraska
Herman A. Sampson, North Carolina State University
Shelly R. Sitton, Oklahoma State University
Robert J. Stephenson, Fort Hays State University, KS
Kirk Swortzel, Mississippi State University
Elaine Turner, University of Florida
Bonnie Walters, University of Wisconsin, River Falls
Wendy Warner, North Carolina State University
Dean Winward, Southern Utah University

Liaisons
NACTA Judging Contest
Lyle Westrom, University of Minnesota, Crookston

Delta Tau Alpha
Jean Gleichsner, Fort Hays State University, KS

AASCARR
Billye Foster, Tenn Tech University

APLU
Jean Bertrand, University of Georgia

CFAVM & CADAP
Kent Mullinix, Kwantlen Polytechnic University, Surrey, BC

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Nominating
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NACTA Foundation Advisory Council
Rick Rudd
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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