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Table of Contents

A Comparison of Faculty and Student Perceptions Toward Academic Dishonesty in an Agricultural Program at University of Wisconsin-Platteville. Sam Bauman & Dr. Mark Zidon, University of Wisconsin-Platteville

A Districtwide Look at Agricultural Educators Perceptions of Standards Based Grading. Lauren Worley, Dr. Jonathan Ulmer, Dr. Katie Burke & Dr. Gaea Hock, Kansas State University

An Examination of All-Terrain Vehicle (ATV) Usage Behaviors of Youth Participating in a School-Based ATV Safety Training Program. Dr. Haley Rosson, Dr. William Weeks & Dr. Penny Pennington Weeks, West Virginia University

Comparing Perceived Undergraduate and Programmatic Learning Outcomes in a Department of Community Sustainability. Jack Rumery, Dr. Crystal L. Eustice & Dr. Michael W. Everett, Michigan State University

Examining Agricultural Students Experiences and Skills in an Agricultural Capstone Course. Skyler P. Rinker, Dr. Mark Hainline & Dr. Scott Smalley, Iowa State University

Examining secondary talented and gifted and agricultural education experiences relative to college major and career choice. Darcie Gallagher, Dr. Jonathan Ulmer, Dr. Gaea Hock, & Dr. Jason Ellis, Kansas State University

Perceptions of Agricultural Educators Entering the Profession through Alternative Means. Allison Faivre, Scott Smalley & Mark Hainline, Iowa State University

Science Efficacy of Agriculture Education and Science Teachers Participating in a Professional Development Program. Jesse Bower, Dr. Bryan Reiling, Dr. Nathan Conner, Matt Kreifels & Dr. Mark Balschweid, University of Nebraska

Transitioning from Mid-Career to Veteran Teacher Status. Laura Hasselquist & Nicole A. Graves, South Dakota State University

Win, Lose, or Draw: Games in AFNR Education. Aaron J. McKim, Robert B. McKendree & Catlin M. Pauley, Michigan State University

**A Comparison of Faculty and Student Perceptions Toward Academic Dishonesty in an
Agricultural Program at the University of Wisconsin-Platteville**

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Introduction

Academic dishonesty has long been prevalent in education. As many as 95 percent of college students admit to having cheated at least once (Cazan & Iacob, 2017). McCabe (2005) reported that 21 percent of respondents admitted to serious cheating on exams and 51 percent admitted at least one incident of cheating on written work.

Academic dishonesty includes, but is not limited to, cheating from other students on exams, plagiarizing term papers, using crib sheets, copying assignments and using electronic devices to find answers. Huang and Yang (2015) used a seven-dimensional construct to study academic dishonesty which included plagiarism, deceptive infringement, cheating on an examination, improper cooperation, concealment and tampering, misuse of credit, and behind-the-scenes work.

We were unable to find literature regarding the prevalence or perception of academic dishonesty in agricultural programs in the US. However, because agricultural students are generally a close-knit group, there is reason to believe academic dishonesty might thrive among these students. Michaels and Miethe (1989) found that college students report a higher level of pro-cheating attitude if they think their peers share that attitude. Therefore, we wonder if the closeness of agricultural students makes it easier to engage in academic dishonesty.

Need for the Study

Although not apparently overwhelming, the concern regarding incidents of academic dishonesty at the University of Wisconsin-Platteville combined with the lack of literature on academic dishonesty among agriculture programs prompted the need for this study. In American Association For Agricultural Education National Research Agenda 2016-2020 Edgar, Retallick and Jones (2016) cited Edgar (2012) and Schunk (2004), as stating meaningful learning begins low-level learning and progresses to critical thinking. So, while the Agricultural Education research agenda compiled by David Doerfert (2016) does not explicitly address academic dishonesty, we conclude that the progression to critical thinking does not happen when students engage in academic dishonesty and therefore, this research can add to the national Agricultural Education Research agenda.

Conceptual Framework

Several models appear in the literature explaining why students cheat. Harding, Mayhew, Finelli and Carpenter (2007) used a modified model where intention leads to behavior. Intentions are influenced by moral obligation which, in turn, is influenced by moral reasoning. Intention is also affected by attitude toward behavior, subjective norm and perceived behavioral control. Murdock and Anderman (2006) used a model based on three guiding motivational questions that lead to the propensity to cheat: What is my purpose [in cheating]? Can I do this? and, What are the costs? Using the models in the literature, we developed a model based on the gap between desired achievement and anticipated performance. When anticipated performance is equal to desired achievement, there is no reason to cheat. When a gap exists, the student has three options: 1) increase their effort, 2) lower their expectations, or 3) revert to academic

dishonesty. The student's decision is influenced by factors that encourage academic dishonesty and factors that discourage academic dishonesty. Factors that promote cheating might include encouragement by friends, ease of doing it, and the attraction of the expected results. Factors that block a student's willingness to cheat might include fear of getting caught, fear of the consequences and moral obligation. Our study was intended to clarify this model based on perceptions of students and of faculty.

Purpose and Hypotheses

The purpose of our study was to clarify our proposed model based on perceptions of students and of faculty. A student's perception of plagiarism might differ from that of a teacher. A student might think nothing of working on an assignment with another student and turning in an identical product while a teacher views this as cheating. Our purpose was to compare the perceptions of the students and faculty. Our research questions were:

1. Do students and faculty have the similar perceptions regarding what constitutes academic dishonesty?
2. Do students and faculty agree on how much academic dishonesty exists in the agricultural classes at the University of Wisconsin-Platteville?

Our objectives were to:

1. Determine the perceptions of students and faculty regarding the severity of selected acts of academic dishonesty.
2. Compare student and faculty perceptions of selected acts of academic dishonesty.
3. Determine the frequency of student participation in selected acts of academic dishonesty.
4. Determine the faculty perception of the frequency of occurrence of selected acts of academic dishonesty.
5. Compare the student frequency and faculty perception of academic dishonesty.

The null hypotheses tested were:

1. There is no difference between student and faculty perceptions of the severity of selected acts of academic dishonesty.
2. There is no difference between the frequency students admit to academic dishonesty and the faculty perception of this frequency.

Methods

After reviewing the literature, we developed a list of ten items that constituted various levels of academic dishonesty. We had our instrument reviewed to confirm face validity. After receiving approval from the Institutional Review Board, we identified a class period during the week where a large number of upper-level classes in agriculture were held. We wanted to collect our data from upperclassmen in order to avoid students referring to their high school experience. We also wanted one class period to avoid having repeat students complete multiple surveys. While this sample of convenience was not a random sample of the 800 agriculture students, it was the most appropriate given our limited resources. We gave the identical survey to faculty,

with one exception; rather than asking how often they cheated, we asked faculty how often they thought academic dishonesty occurs in their classes.

We compiled and analyzed the data on Microsoft Excel. We calculated Chronbach's alpha on parts of the instrument to determine reliability. Coefficients ranged from 0.976 to 0.986.

Findings/Results

Twelve faculty members and 105 students participated in the survey. Forty-nine percent of the students indicated being male while 51 percent were female. Only one student indicated being other than Caucasian. Faculty demographics were not collected as that would have identified these respondents.

Significance level for null hypothesis 1 and null hypothesis 2 was set apriori at 0.05. Data regarding null hypothesis 1 showed there was no difference between student and faculty rating of the level of academic dishonesty of eight of the ten dishonest activities as is illustrated in Table 1.

Insert Table 1 here

While there is little difference in perceptions of level of dishonesty between faculty, Table 2 shows that the perception of frequency by faculty and the frequency students admit participating in dishonest activities is very different. Null hypothesis 2 was rejected for all ten activities. Because of the possible incriminating nature of the questions, students were asked how honest they had been in their responses to the questions. Eighty-two of the 105 participants indicated they had been completely honest. An additional 17 students said they had been mostly honest. Five students said they had not been honest at all. These respondents were included in the data because it was not known whether they might have misread the question.

Insert Table 2 here

Conclusions

It must be noted that this was an action research descriptive study at the University of Wisconsin-Platteville. Generalities cannot be made beyond this university. The results are useful for the agriculture program at the University of Wisconsin-Platteville but are only valuable to guide research questions at other settings.

Two conclusions can be made from this research.

1. Faculty and students agree on the level of academic dishonesty specific actions constitute. Differences occurred in only two activities: bribing someone in exchange for help on an assignment or a passing grade and working with others on an individual assignment when not given specific or implied permission from the instructor. Students

reported bribing as seldom occurring while working together without permission was reported as being more occasionally.

2. Faculty and students do not agree on the frequency of the academic dishonesty occurrences. The mean for faculty was greater than the mean for students in all ten examples of academic dishonesty.

This study seems to raise more questions than it answers. Are students completely honest about admitting the frequency of cheating? Do faculty members overestimate the level of academic dishonesty? Because the students in agriculture are a close-knit group, is the propensity to cheat more likely?

Recommendations

Several recommendations are made based on the results of the survey.

1. Faculty should increase their efforts to verify the frequency of academic dishonesty among students.
2. Faculty should communicate their expectations of academic dishonesty to students, especially regarding working with others on an individual assignment when not given specific or implied permission from the instructor.
3. Further research should be conducted to determine if academic dishonesty is more frequent when students are close-knit compared to other disciplines.
4. Further research should be conducted to validate and enhance a gap model of academic dishonesty among agriculture students.

Tables

Table 1. Faculty and Student Perceptions of Academic Dishonesty of Selected Activities.

	Faculty			Students			t-test *p < 0.05
	Mean ¹	S Dev	n	Mean	S Dev	n	
1. Using an assignment you obtained from a friend that took the same class in a previous semester:	3.333	1.371	12	2.752	1.026	105	0.180
2. Using a copy of an exam you obtained from a friend that took the same class in a previous semester:	3.250	1.603	12	3.276	1.275	105	0.957
3. Looking at someone else's paper for an answer to a question while taking an exam:	4.500	1.000	12	4.181	0.978	105	0.312
4. Using the internet or notes on an exam without the instructor's permission:	4.250	1.545	12	4.219	0.877	105	0.947
5. Bribing someone in exchange for help on an assignment or a passing grade:	4.454	1.214	11	3.533	1.287	105	0.035*
6. Misrepresenting an assignment intended to deceive the instructor:	4.250	1.055	12	3.644	1.033	104	0.093
7. Working with others on an individual assignment when not given specific or implied permission from the instructor:	3.167	1.404	12	2.152	0.928	105	0.031*
8. Submitting the same assignment or paper for more than one class:	2.917	1.443	12	2.257	1.241	105	0.152
9. Talking, using a mobile device or computer while the instructor is lecturing:	2.167	1.404	12	2.000	1.177	105	0.699
10. Directly copying information from the internet or other sources to use on an assignment or paper:	4.400	1.075	10	3.829	1.189	105	0.140

¹ Based on a Likert scale where 1 = Not at all dishonest to 5 = Extremely dishonest

Table 2. Faculty Perceptions and Student Admittance of Frequency of Academic Dishonesty of Selected Activities.

	Faculty			Students			t-test *p < 0.05
	Mean ²	S Dev	n	Mean	S Dev	n	
1. Using an assignment you obtained from a friend that took the same class in a previous semester:	3.750	0.042	12	2.086	0.456	105	0.000*
2. Using a copy of an exam you obtained from a friend that took the same class in a previous semester:	3.500	0.207	12	1.886	0.601	105	0.000*
3. Looking at someone else's paper for an answer to a question while taking an exam:	3.167	0.486	12	1.457	0.214	105	0.000*
4. Using the internet or notes on an exam without the instructor's permission:	2.583	0.985	12	1.448	0.231	105	0.002*
5. Bribing someone in exchange for help on an assignment or a passing grade:	2.083	0.985	12	1.238	0.058	105	0.013*
6. Misrepresenting an assignment intended to deceive the instructor:	2.833	0.772	12	1.183	0.036	104	0.000*
7. Working with others on an individual assignment when not given specific or implied permission from the instructor:	3.417	0.395	12	2.610	0.391	105	0.005*
8. Submitting the same assignment or paper for more than one class:	3.000	0.826	12	1.562	0.268	105	0.000*
9. Talking, using a mobile device or computer while the instructor is lecturing:	3.500	0.207	12	1.176	1.176	105	0.005*
10. Directly copying information from the internet or other sources to use on an assignment or paper:	3.417	0.657	12	1.571	0.267	105	0.000*

² Based on a scale where 1 = Never, 2 = Seldom (a few times per semester), 3 = Occasionally (a few times per month), and 4 = Frequently (a few times per week)

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A Districtwide Look at Agricultural Educators' Perceptions of
Standards Based Grading

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Several studies have been conducted on the use of standards-based grading, however, there are multiple views on how to use this grading system and controversy of its effectiveness in all classroom settings. Illinois agriculture classroom teachers have been exposed to standards-based grading in various facets, but it has yet to be determined if everyone is on the same page in beliefs, grading styles and policies across districts.

Literature Review

Traditional style grading seems to be becoming just that: a tradition. In the last several years, the thought has shifted from traditional letter grades to what some proponents believe is measuring student learning in a better way. The method is standards-based grading and it is “an alternative form of grading in which a student's achievement is based on their performance on a clearly defined set of standards rather than on their performance on tests and assignments” (Scarlett, 2018, p. 1). There has been several years of research surrounding the idea of standards-based grading and education is now seeing this becoming more common and put into practice more often. Teachers are receiving training and studies are being done to show that this method works, but with teachers being the forefront of our educational system, is anyone taking the time to find out how teachers feel about the system?

The current grading scale has been in practice for over a century and according to Marzano (2000) lacks research to back up its purpose (Townsend, 2016). Grading systems and practices vary from classroom to classroom, district to district and grades often serve several purposes. Grades in the traditional grading system are weighted based on quizzes, tests and sometimes how much a student participates.

To some, standards-based grading looks great on paper, but teachers are skeptical about moving forward with something new. Changing the grading process from something that “teachers and parents remember from their own school days can be slow, messy and controversial” (Yaffe, 2017, p. 1)

Moving forward using standards-based grading, teachers report progress to students “by averaging scores they received on rubrics indicating a level of mastery of course objectives” (Scarlett, 2018, p. 1). This is supposed to allow students and parents to better understand their mastery of learning and skills. Using the standards-based grading method, it “allows students to retake tests, and it doesn't assign a zero for any work--even if it's not turned in” (Scarlett, 2018, p. 1). With the latest push of making students college and career ready at the high school level, many are wondering why disregarding assignments, and then not having consequences, is becoming so popular. Many teachers are seeing an increased workload.

A study done in Wisconsin showed that teachers saw a decrease in the amount of homework being completed by students (Idzerda, 2018). As part of this grading system, students do not receive zeros for work not completed. Many times, the lowest grade that a student can receive is a fifty percent and often get multiple opportunities to redo assignments. This process increased teacher workload. Surveys were given to teachers asking about what resources the school could provide them to assist with the new grading system, but teachers were not asked if they believed the system was working.

Parents, who grew up in the age of the traditional grading scale, are confused at the idea of no zeros and students not being held accountable for work that isn't turned in for evaluation (Idzerda, 2018). Parents seem to be frustrated that their students are not completing assigned work.

The idea of standards-based grading is that students do not all learn at the same speed, so why confine them to a set time period of when they need to know a certain skill (Townsend, 2016). On the contrary, are we preparing students to work and be successful in college if we are allowing them to choose when and if they complete work? Several articles also go on to discuss mental health with young college students who always received high grades in high school and suddenly don't have set rules on how to receive an A (Idzerda, 2018).

As we move forward in the next few years, it is inevitable that there will be change. It will just depend on how serious this standards-based grading system movement is. The purpose of this study was to determine teachers' perceptions of standards-based grading and if they or their school are using standards-based grading.

Methodology

The target population was agriculture instructors from Illinois. The accessible sample for this study came from District 1 (N = 75). Overall, 32 teachers participated in the study, but only 27 datasets were useable for a response rate of 36%. Of the useable data, twelve participants (45%) were male, while 15 (56%) of the participants were female. Ultimately, all 27 participants hold certificates in agricultural education, with 10 of the participants holding certificates in additional areas. With the small sample and response rate, insufficient power was achieved to allow generalizing the data to a larger population, therefore non-response error was not addressed.

Participants reported varying levels of knowledge when asked if they knew what standards-based grading is. Seventeen participants reported yes to knowing what standards-based grading is while 8 said maybe and 2 reported they did not know. Two participants reported that they use standards-based grading.

All procedures were approved by the University Institutional Review Board. The study was designed based on methods from Dillman, Smyth and Christian (2014). The survey was distributed through Qualtrics® and teachers were invited to participate via email. After the initial invitation, two reminders were sent. The study was quantitative in nature and followed the descriptive-survey design.

The instrument that was used is mirrored from a study completed at National Lewis University (Finch, 2016.) The study was deemed reliable and valid by previous studies. The first section addressed demographics asking the participants about their teaching experiences. After being provided an operational definition of standards-based grading, respondents were asked to indicate their familiarity, if they currently use this method and if their school uses this method. The second section was made up of 21 Likert-scale questions in two subsections: grading practices and perceptions of traditional grading and standards-based grading practices, with ranges from strongly agree to strongly disagree. The reliability estimates were lower than

typically recognized as acceptable. To calculate the Parallel estimate, four questions were reverse coded. The four questions were selected based on the population having knowledge in, but little experience of, standards-based grading. The post-hoc analysis estimated reliability for the first section as .58 and .62 for the second section.

Results

Five participants (19%) reported that their school currently uses standards-based grading and 20 (74%) reported that neither them nor their school use standards-based grading. A majority (25, 93%) of participants agreed or strongly agreed that students' academic success is accurately represented when teachers give feedback on performance related to learning standards. Participants also indicated (24, 89%) that student assessment methods should be flexible to represent what a student knows, understands and can do. Participants agreed (22, 81%) that often times behavioral performances like conduct, attendance, promptness and other items should play a role in grading. More than 80% (22) of participants agreed that zeros should be used when determining a student's grade and when it came to assigning an "incomplete" until students could provide evidence to demonstrate what they know, 77% agreed. It was found that 21 teachers (78%) disagree or strongly disagree with teachers accepting late work without reducing points for a given assignment. Many teachers agree (17, 63%) that when reporting student achievement, using learning standards is effective and informative for all stakeholders involved. Twenty-three teachers (85%) agreed or strongly agreed that students should be provided with rubric or work exemplars prior to independent work. When it came to students self-assessing and including group work, over 75% of participants (20) believe both of these items should count as part of a student's grade. When it came to homework though, 26% (7) had no opinion or disagreed that homework should be included while calculating grades.

Twelve participants (44%) noted that the current letter grade method is not effective and informative for all stakeholders involved in the process. More than 60% (17) indicated that reporting grades by learning standards is effective for everyone involved. According to data, 48% (13) of respondents agree or strongly agree and 44% (12) disagree or strongly disagree with using the current letter grade system to provide students with accurate feedback in order to increase their learning. The data looks very similar when it comes to using that same letter grade method to report data to parents. Lastly, 74% (20) of respondents agree that the letter grade method for reporting student achievement allows teachers to direct further instruction, and 78% (21) say that standards-based grading gives teachers that same opportunity.

Conclusions

It can be concluded that more research needs to be done on a larger scale to really determine where agricultural educators fall on the spectrum of their feelings and perceptions of standards-based grading practices. After looking at the data, it can be noted that teachers are aware of the practice, feel that its beneficial and see the reason for using it, but continue to use traditional letter grade methods. Further research could be focused on why this is happening. When it comes to assigning zeros, literature and this study show a slight disconnect (Idzerda 2018). Literature about standards-based grading states that incomplete work or homework cannot be given a zero because we cannot accurately measure what the student knows, understands or is

able to produce (Scarlett 2018), but findings in this study show teachers agreeing that zeros and incompletes need to be assigned.

There is a disconnect between awareness and use, as 63% of participants know what standards-based grading is, but only 26% report that they or their schools use the method. This could indicate that the lack of adoption is due to a barrier that was not flushed out in this study. Teachers may be willing to try this new method if there were more trainings available to them. If parents are not familiar, they may question teachers more about student's grades and not understand the process. Anything unfamiliar or that brings changes is uncomfortable and requires learning. Teachers may not be willing to make the shift and parents may not be accepting, simply because they are comfortable using the current method.

Recommendations

Professional development relating to standards-based grading could be conducted in order to make teachers more aware of the practice and how to make use of it in their own classroom settings. Teachers need to evaluate their own classroom or curriculum learning standards to ensure students are being evaluated on important skills and standards. Standards-based grading is most easily adopted in skills based courses and many agriculture classes are skills based. Therefore, administrators and teachers should work together to see how standards-based grading can be efficiently adopted into agriculture classes. Teacher education should prepare future teachers by exposing teaching candidates to standards-based grading evaluation methods.

When conducting further research, it is recommended to have a larger sample size. More detailed investigations could be done by assessing teachers' current grading practices to see what methods are most commonly used. Based on findings in this study, one question remains: what is the reason teachers continue to use traditional grading methods when a vast majority of participants see that there can be a benefit to assessing students based on learning standards. If teachers are using standards-based grading, research should be conducted to evaluate their systems and see if practices are similar from district to district or even classroom to classroom. Research could also shed light to the number of schools using standards-based grading and then further explore to see if standards-based grading is improving skill retention in students.

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An Examination of All-Terrain Vehicle (ATV) Usage Behaviors of Youth Participating in a School-Based ATV Safety Training Program

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An Examination of All-Terrain Vehicle (ATV) Usage Behaviors of Youth Participating in a School-Based ATV Safety Training Program

Introduction

Each year in the United States, hundreds of fatalities and thousands of accidents are reported related to all-terrain vehicle (ATV) usage. Youth are considered an especially at-risk population, predominantly children 16 years of age or younger. Reasons attributed to youth fatalities and/or accidents related to ATV-usage include a lack of helmet use, riding with passengers, riding without adult supervision, riding after dark, and riding ATVs too large or powerful for the child's age and size (Campbell et al., 2010; Brown, Koepplinger, Mehlman, Gittelman, & Garcia, 2002; Tormoehlen & Sheldon, 1996; Hargarten, 1991).

According to the *2016 Annual Report of ATV-Related Deaths and Injuries*, published by the U.S. Consumer Product Safety Commission (U.S. CPSC) (2017), 14,653 ATV-related fatalities, occurring between 1982 and 2016 were reported in the U.S. In the reporting period between 1982 and 2016, 22% of the total number of ATV-related fatalities reported occurred with children younger than 16 years of age (U.S. CPSC, 2017). According to Jones and Bleeker (2005), many of the ATV-related injuries among youth have occurred when “the operator lost control, the vehicle rolled over, the operator or passenger was thrown off, or there was a collision with a fixed object” (p. 70).

In Oklahoma, 142 ATV-related deaths were reported between 1982 and 2007 (25-year period) of which 53 were children under the age of 16 (U.S. CPSC, 2015). In a study conducted by the Oklahoma State Department of Health during a ten-year period from 1992-2002, 391 people were hospitalized due to injuries sustained from riding an ATV, 38 of whom died due to head injuries (Oklahoma State Department of Health, 2016). In that same time frame (1992-2002), the average number of injuries tripled from 23 injuries per year prior to 1998 to an average of 69 injuries per year thereafter. Oklahoma is currently ranked 24th in the nation for the number of reported ATV-related fatalities (U.S. CPSC, 2017).

Similar to findings of other studies that have examined ATV usage behaviors among youth populations, youths living on farms and in rural areas tend to mirror national trends. In an examination of ATV safety and use patterns of 4-H'ers in Oklahoma, youth reported operating adult-sized ATVs, carrying passengers, and not wearing helmets and/or other appropriate safety equipment (Hafner, Hough, Getz, Whitehurst, & Pearl, 2010). These same youth were found to rarely have participated in any form of ATV safety training and accidents were numerous, indicating a key area for educational intervention (Hafner et al., 2010).

Theoretical Framework

The theoretical framework proposed for this study is Kolb's (1984) experiential learning theory (ELT). Kolb (2015) defined learning as “the process whereby knowledge is created through the transformation of experience” (p. 49). He posited that successful educators are able to organize their educational activities in such a way that all four learning modes are addressed – experiencing, reflecting, thinking, and acting – and are thereby able to “teach around the learning

cycle” (p. 301). Often, this cycle is completed in a recursive fashion, effectively becoming a learning spiral where each new experience created becomes “richer, broader, and deeper. Further iterations of the cycle continue the exploration and transfer to experiences in other contexts” (Kolb, 2015, p. 301; Kolb & Kolb, 2009).

The justification for using Kolb’s experiential learning theory for this study is the emphasis placed on the experiences associated with an ATV safety training. As Carver (1996) posited, “experiential education is holistic in the sense that it addresses students in their entirety,” (p. 151) and involves any combination of senses, emotions, physical condition, and cognition. This study consisted of a school-based assembly, which utilized a PowerPoint presentation, videos/film, printed handouts, and static demonstrations with both youth- and adult-sized ATV machines.

Purpose and Objectives

The purpose of this study was to describe ATV usage behaviors of students prior to and after participation in an educational ATV safety training. The research objectives for this study were guided by the following objectives:

1. Describe the demographic characteristics and prevalence of ATV use of students participating in a school-based ATV safety training;
2. Determine if ATV usage behaviors - pertaining to prevalence of helmet use, safety equipment/riding gear use, riding and/or operating ATVs with passengers, riding on public roads or highways, and riding inappropriately sized machines – changed after participation in an ATV safety training.

Methods and Procedures

The selected sample surveyed for this study consisted of all middle-school and high-school-aged students at Coyle Middle/High School, a rural public-school system located in northeastern Oklahoma, who participated in a school-based ATV safety training. The study was conducted using a one-group pre-test/post-test survey research design.

The questionnaire utilized for this study was adapted, with permission, from a survey instrument created by Novak, Hafner, Aldag, and Getz (2013). Reliability of the instrument pertaining to behaviorally-related questions was established post hoc using Cronbach’s alpha coefficient for reliability estimates. Cronbach’s alpha indicates high reliability for questions designed to measure the construct of ATV-related behaviors ($\alpha = .809$).

All students in grades 6 – 12 who were in school that day attended the ATV safety training ($N = 155$) and completed a self-reported pre-test questionnaire during their homeroom class period. A post-test questionnaire was completed approximately three months after the ATV safety training in the same format. A final total of 122 questionnaires (both pre- and post-test responses collected) were deemed usable for analysis, yielding a final response rate of 79.0%.

The school-based ATV safety training was conducted by the ATV Ride Safe [State] State Training Coordinator. A Microsoft PowerPoint presentation was utilized, highlighting ATV-related injury statistics; definitions of various types of ATVs and side-by-side machines; appropriate safety gear; machine fit guidelines and age/size recommendations; and safe riding strategies. Static demonstrations were conducted using both youth- and adult-model ATV to demonstrate improper rider-fit requirements. Two videos related to the “Golden Rules of ATV Safety,” (ATV Safety Institute, 2016), as well as a short film highlighting a local ATV accident survivor, were also utilized. At the conclusion of the training, students received an ASI “Safe Riding Tips” brochure and were encouraged to complete the online ASI ATV safety E-course.

Data were input and analyzed using the *Statistical Package for the Social Sciences v. 21.0*. Data associated with objective one were analyzed using descriptive statistics, including frequencies and percentages. Paired-sample t-tests were employed to analyze the second objective of this study.

Results

Research objective one sought to describe the demographic characteristics and prevalence of ATV use of students participating in a school-based ATV safety training. Over half of the students were reported as being male (59%), and were almost evenly split among grades 6-12, with students ranging in age from 11 to 18 years old. Nearly all students reported living in either a rural setting (45.9%) or in town (50.8%). Adult-model ATVs were most commonly reported as being both owned and operated by youth and their families. Students most commonly reported using ATVs for fun (50.8%) and riding 1-10 times within the past three months (23%). The highest percentage reported for helmet ownership/use was for students who neither own nor borrow helmets (45.1%).

Research objective two sought to determine if ATV usage behaviors - specifically pertaining to prevalence of helmet use, safety equipment/riding gear use, riding and/or operating ATVs with passengers, riding on public roads or highways, and riding inappropriately sized machines – changed after participation in the ATV safety training. Students were categorized as either “experienced” ($n = 70$), indicating that they had previous experience with operating ATVs, or “non-experienced” ($n = 52$), indicating they had very little or no experience with operating ATVs. Since only “experienced” students could report ATV usage behaviors, “non-experienced” responses were excluded from analysis pertaining to research objective two.

Relatively low compliance with the best safety practices as suggested by ASI was demonstrated. The highest percentages related to helmet usage were for students who “rarely” or “never” wear helmets (54.3% pre-test, and 48.6% post-test). The percentage of students who “always,” “most of the time,” or “sometimes” carried a passenger decreased from 44.3% to 35.8%. The highest percentage reported related to operating an ATV on public roads and/or highways for pre-test results was for students who “rarely” or “never” performed the behavior (67.1%); this figure decreased (50%) for the post-test. Pertaining to the use of safety gear, the highest percentages reported for both pre- and post-test results were for students who “never” or “rarely” (55.7% to 47.2%) wore safety gear. The prevalence of riding adult-sized ATVs decreased between pre- and

post-tests for students who reported “always,” “most of the time,” or “sometimes” performing the behavior (71.5% to 57.2%).

Paired-samples t-tests were conducted to compare the means of pre- and post-test responses. Statistically significant differences were found for four of the five pairs: Behavior #1: Wearing a Helmet $t(69) = 3.390, p < .05$, Behavior #2: Carrying a Passenger $t(69) = 2.135, p < .05$, Behavior #4: Wearing Safety Gear $t(69) = 3.071, p < .05$, and Behavior #5: Riding an Adult-Sized ATV $t(69) = 2.875, p < .05$. Results for positively associated behaviors, Behavior #1: Wearing a Helmet ($\Delta 0.65$), and Behavior #4: Wearing Safety Gear ($\Delta 0.65$), indicate that behaviors worsened from pre- to post-test. Results for negatively associated behaviors, Behavior #2: Carrying a Passenger ($\Delta 0.37$) and Behavior #5: Riding an Adult-Sized ATV ($\Delta 0.58$), indicate that behaviors also worsened from pre- to post-test.

Discussion

The results of this study indicate that the school-based ATV safety training was largely ineffective at changing ATV-related behaviors. The stagnancy exhibited in terms of behavior change may provide evidence that a one-time program simply isn't enough to elicit lasting change. Youth ride ATVs because it is fun and appear to ride regardless of knowing they are engaging in inappropriate, even illegal, behaviors.

In terms of Kolb's (1984) experiential learning theory (ELT), and as exhibited by the results of this study, a component of the experiential learning cycle may have been lacking – an opportunity to actively experiment with the concepts taught during the presentation. Students were given the information and were able to grasp it, but they lacked the opportunity to transform said information and actively apply it. This is where the researcher believes that application is called for in the form of an interactive training session, where students have the opportunity to actively experiment and apply newly introduced concepts, such as in the form of an *ASI RiderCourse™* training.

Implications/Recommendations for Future Research

Results from this study indicate that helmet usage is not a commonly adhered to practice and that many youths operate, or are passengers, on adult-sized ATVs. Research related to reducing financial barriers to purchasing helmets for ATV use, as well as enforcing ATV size restrictions, should continue to be explored. As suggested by Novak et al. (2003), additional research should be conducted related to the employment of broader, community-based trainings that involve not only youth, but also parents and community leaders. Additionally, research examining the effectiveness of interactive ATV safety training sessions should be explored.

The continued prevalence of injuries and fatalities related to ATV use among youth has been identified as an ongoing concern. It is imperative that continued efforts be made to provide effective educational programming to youth, as well as adults, regarding ATV safety. Research efforts should continue to be explored in the hopes of reducing the number of ATV-related injuries and fatalities.

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**Comparing Perceived Undergraduate and Programmatic Learning Outcomes in a
Department of Community Sustainability**

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Comparing Perceived Undergraduate and Programmatic Learning Outcomes in a Department of Community Sustainability

Introduction

Use of programmatic learning outcomes within undergraduate education places focus on educational objectives related to student learning (Shepard, 2008). Since 2013, use of student learning outcomes has been the norm in higher education, with 84% of institutions in the U.S. having adopted some form of learning outcome-based assessments (Kuh, Jankowski, Ikenberry, & Kinzie, 2014). Having a thorough outline that includes measurable course objectives can help increase the precision of curriculum being implemented (Kuh et al., 2014). Similarly, educational experiences utilizing learning outcomes are more adaptable to meet the needs of students (Huba & Freed, 2000). Huba and Freed also indicate that instructional practices drawing from a “learner-perspective” resulted in higher efficacy of student learning (2000). The ability to analyze perceived student learning compared to anticipated programmatic outcomes helps identify appropriate revisions of curriculum and instruction. According to Nelson Laird and colleagues (2008), learning is considered a shared responsibility between instructors and students. Therefore, it is important to compare what students perceive is taking place in the classroom with educational objectives that are being taught. It is increasingly important to understand how students perceive their own learning in order to evolve teaching and curriculum that meets programmatic and workforce needs. The National Research Council (2009) has issued a call for post-secondary agricultural curricula and teaching to utilize dynamic approaches to learning. Understanding student perceptions of this learning will reinforce dynamic instructional approaches.

Conceptual Framework

According to Adam (2002), learning outcome statements support student expectations through understanding and demonstration in the educational experience. The use of learning outcomes as an educational tool is meant to increase the precision and effectiveness of curriculum. By collecting data on perceptions of student learning, comparative analyses can contribute to learner understanding in the context of programmatic outcomes (Adam, 2002). Learning outcomes in the context of this study are utilized by the Department of Community Sustainability to ensure consistent delivery of course objectives, hence providing a framework for curriculum design and development. Adam (2002) suggests that learning outcomes can be utilized to move towards more student-centered and output-focused learning. Use of quantifiable data drawn from learning outcomes can provide support to administrators in decision-making when analyzing differences between student learning (Erwin, 1991). The purpose of this study was to compare how student perceptions of learning in core undergraduate courses were related to departmental programmatic outcomes across three majors in a College of Agriculture.

Methodology

Undergraduate Michigan State University students in the Department of Community Sustainability (CSUS) were surveyed about prior courses taken within the undergraduate majors of agriculture, food and natural resources education (AFNRE), environmental studies and

sustainability (ESS) and sustainable, parks, recreation and tourism (SPRT). The Introduction to Sustainability (CSUS200) course focuses on personal sustainability while placing significant consideration on environmental factors. Theoretical Foundations of Sustainability (CSUS300) immerses students in the history and evolution of sustainability from an environmental perspective. Students were asked about learning experiences within each of the courses that they have taken in relation to the 11 programmatic learning outcomes and the level at which students perceived learning to occur (beginning = 1, developing = 2, competent = 3, and accomplished = 4). Students were asked to rank their perceived learning based on the scale. Students were surveyed using the Qualtrics survey software platform. Validity and reliability were determined through pilot testing of the instrument using a cohort of six current student-teachers and former undergraduates from the CSUS Department. Sixty-one students responded to the survey yielding a 15.5% response rate within the three undergraduate majors of AFNRE ($n = 18$), ESS ($n = 37$), and SPRT ($n = 6$).

Results

Across all three CSUS majors, the average perceived learning score of individual undergraduate course outcomes was above the departmental anticipated outcomes (AFNRE = +0.15, ESS = +0.77, SPRT = +1.36). Data for two required core undergraduate courses (CSUS200, CSUS300) showed that SPRT majors displayed higher learning perception scores than the departmental goals in both cases (CSUS200 = +2.3, CSUS300 = +1.39), ESS majors displayed higher scores in one of the two core classes (CSUS200 = +1.66), and AFNRE students showed only minor increases from the departmental outcomes in both core courses measured.

Conclusions

Despite students of all three majors being exposed to the same, or very similar courses and contexts for learning to take place, the data suggests that student perceptions of what they were learning were above the departmental anticipated outcomes. It is noteworthy that AFNRE students had the lowest overall positive gain from learner perceived to departmental outcomes. These results suggest that a disparity in perceived value of core sustainability courses exists among AFNRE students in comparison to students in the other undergraduate majors. These results may be influenced by AFNRE students agriculturally focused perspectives embedded in course curriculum.

Implications/Recommendations

The results indicate a disparity between perceived learning in the three undergraduate majors with a bifurcation of agricultural and environmental themes. Results indicated that tailoring teaching strategies to address the needs of students within specific majors and students with different backgrounds may be a consideration (Carini, Kuh, & Klein, 2006). Distinct groups based on major may help to facilitate a common student dialogue and understanding of differing perspectives toward environment and agriculture. The authors recommend further research to better understand student perceptions of learning outcomes and the potential for needed curricular changes to align with the National Research Council's (2009) recommendations.

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An Assessment of Student Learning in an Agricultural Capstone Course

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Introduction and Literature Review

As many students enter a high-demand and rapidly-changing agricultural workforce post-graduation, they will be required to possess certain skills to help them become successful in their future positions. In terms of agricultural graduates, Garton and Robinson (2006) recommended certain employability skills were needed for curricular enhancement. Peddle (2000), states that in the workforce, quality and preparation of graduates remain important factors in business location. In a study conducted by Graham (2001) it was found agricultural employers believed general work experience was an influencing factor for graduates or entry-level employees to be successful. Furthermore, previous studies have concluded that an array of skills and abilities are important for agricultural capstone course instructors to implement in the classroom and for agricultural graduates to possess upon entering the workforce Crunkilton, Cepica and Fluker (1997); Robinson, Garton, and Vaughn (2007); Litzenberg and Schneider (1987); Perry, Paulsen, and Retallick (2015).

Although previous literature describes the importance for agricultural graduates to possess certain skills before entering the workforce, and that certain skills should be an area of emphasis in the agricultural classroom, it is important to gauge students' acquisition of skills in capstone courses which prepare them for employment in industry.

Theoretical and Conceptual Framework

Roberts and Ball's (2009) content-based model for teaching agriculture served as the conceptual framework for this study (see Figure 1). This particular model stems from a behaviorist type of educational framework which uses content-centered agricultural education to gain insight on skill acquisition (Roberts & Ball, 2009). More specifically, the portion of the model focuses on agricultural instruction and skill acquisition was the focal point for this research. This aspect of the model accounts for the needs of agricultural industry, followed by a combination of industry validated curricula and educators who are competent in technical knowledge (Roberts & Ball, 2009). The outcome of all of the elements in the model is a skilled worker, able to be successful in the agricultural industry.

First, skill constructs used in this study were industry validated and relevant in time. Secondly, the Iowa State University (ISU) Agricultural Education and Studies (AgEdS) Ag 450 capstone course is designed for students to practice developing the necessary skills related to farm management and operation. Also, Ag 450 provides students with real-world application as it relates to production agriculture. Therefore, describing students' perceptions regarding their beliefs in terms of technical and professional skills before and after completing the course serves as an indicator of the instruction and skill acquisition aspect of Ag 450. Furthermore, by describing students' experiences before and during Ag 450, the agricultural workplace application aspect of the capstone course may be further validated for relevancy.

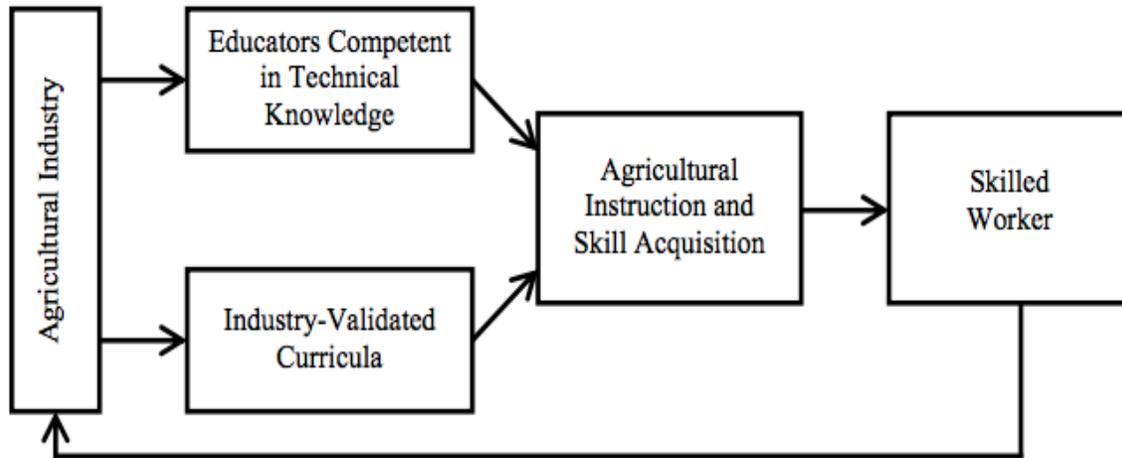


Figure 1. A content-based model for teaching agriculture.

Purpose and Objectives

The purpose of this study was to describe students' agricultural experiences before and during Ag 450 and also describe their self-perceived acquisition of professional and technical skills. The following three objectives guided this research study:

1. Describe students' professional and academic agricultural experiences before and during Ag 450.
2. Describe students' self-perceived competence associated with industry-identified technical skills before and after completing Ag 450.
3. Determine students' levels of agreement with their attainment of industry-identified professional skills after completing Ag 450.

Methods and Procedures

Descriptive survey research was used to describe students' experiences and perceptions of technical skills and professional skills before and after completing an agricultural capstone course. The tailored design method as described in Dillman, Smyth, and Christian (2014) was used as the foundation for the research design. A double-matrix six-point scale (1 = *No competence*, 2 = *Fundamental awareness*, 3 = *Novice*, 4 = *Intermediate competence*, 5 = *Advanced competence*, 6 = *Expert*) was provided for students to describe their perceptions of industry-identified technical skills. A five-point scale (1 = *Strongly disagree*, 2 = *Somewhat disagree*, 3 = *Neither agree nor disagree*, 4 = *Somewhat agree*, 5 = *Strongly agree*) was provided for students to assess their level of agreement with their attainment of professional skills. Open-ended questions were included to determine the students' background and demographic characteristics.

Participants

The participants in this study were students enrolled in Ag 450 in a fall semester. Of the 67 students who were enrolled in the course, 62 students completed the instrument for a 92.5% response rate. Based on the high response rate, no measures no analysis of nonresponse error was necessary (Lindner, Murphy & Briers, 2001).

Data Collection

The instrument was distributed to all of the Ag 450 students at the end of the semester. The survey instrument contained three major sections which aligned with the three main research objectives. Section one contained 18 technical skills which had been identified as important by agricultural industry experts. Students were asked to first rate their level of competence for each skill at the beginning of the Ag 450 and then were asked to rate their current level of competence for each skill after completing Ag 450.

Section two included 34 industry validated professional skills. The students were asked to rate their competence level associated with each skill after completing Ag 450. The third and final section of the survey contained a total of seven open-ended and multiple-choice questions relating to their professional and academic experiences before and after completing Ag 450 as well as demographic questions (i.e., age, gender, academic classification).

Data Analysis

The Statistical Package for Social Sciences (SPSS[®]) Version 23 was used to analyze the data for this study. Descriptive statistics (i.e., frequency, percentages, means, and standard deviations) were calculated to interpret students' perceptions of their competence of industry validated technical and professional skills before and after completing Ag 450. For the third objective, the data regarding students' professional experiences, academic experiences, and demographic information were reported utilizing descriptive statistics and reporting.

Results

The first objective in this study sought to describe students' professional and academic experiences before and during Ag 450. Of the 61 participants who responded to the demographic/background questions, 15 identified themselves as female, 46 identified themselves as male. The average age of the students was 21 ($SD = 1.21$) years old, with a range spanning from 20 to 26 years of age. Aside from one student with a junior classification, all other students reported having a senior academic classification. Over 80 percent of the students indicated they engaged in a previous internship experience. The students indicated their internship experiences were related to agronomy, agricultural technology, animal nutrition, agricultural cooperatives, seed, agricultural research, animal science, cooperate farming operations, custom farming operations, university extension, soil and water conservation, and general livestock. In terms of professional and agricultural experiences while enrolled in Ag 450, students reported a wide array of Experiential Learning Activities (ELA's). Those activities included harvest equipment operations (e.g., grain cart, combine, anhydrous ammonia application, tillage, etc.), farm

equipment precision technology (e.g., GPS), grain marketing, sheep management, swine management, welding, and working with industry representatives (seed).

One of the course requirements of students enrolled in Ag 450 is to serve on a course-based committee throughout semester. Membership on the customs and swine committee was reported by 14.8% of the students, 19.7% of the students served on the finance and marketing committee, 14.8% served on the machinery committee, 16.4% served on the buildings and grounds committee, 16.4% served on the public relations committee, and 18.0% served on the crops committee.

The second objective of this study was to assess students' self-perceived competence associated to technical agricultural skills before and after completing Ag 450. Although some variance was found in the students' competence ratings, in particular before beginning the class, common themes or patterns were also discovered. For each of the technical skills, students indicated their competence was higher after having completed the Ag 450 course. Moreover, each of the technical skills received an average rating of a 4 (*intermediate competence*) out of 6 from all of the students. Skills that received the highest mean ratings after completing the course were "general knowledge of the agricultural industry" ($M = 4.92$; $SD = 0.56$), "assessing needs of farmers" ($M = 4.82$; $SD = 0.62$), "written communication skills" ($M = 4.80$; $SD = 0.63$), "experience working with producers" ($M = 4.80$; $SD = 0.70$), and "verbal communication skills" ($M = 4.74$; $SD = 0.63$).

The third objective of this study sought to determine students' self-perceived competence related to professional agricultural skills before and after completing Ag 450. Students were asked to rate each of the 34 professional skills on a 5-point scale. Each of the 34 industry-validated professional skills received an average mean rating of a 4 out of 5 with means ranging from 4.08 to 4.69. Professional skills with the highest means included students considering themselves to be "trainable" ($M = 4.69$; $SD = 0.79$) and "accountable" ($M = 4.66$; $SD = 0.79$). Other professional skills which students indicated high perceived competence were "positive work ethic" ($M = 4.66$; $SD = 0.79$), "respectful" ($M = 4.64$; $SD = 0.84$), "passionate" ($M = 4.64$; $SD = 0.80$), and "demonstrating integrity" ($M = 4.62$; $SD = 0.80$).

Conclusions and Discussions

The results of this study are congruent with prior research and align with the outcomes of Roberts and Ball's (2009) model for teaching agriculture. This model is continuous, but begins with the agriculture industry, followed by competent agriculture educators and industry-validated curricula. The educators are tasked with providing students with agricultural instruction which provides opportunities for skill acquisition. The product of this model is a skilled worker which is ready to enter the agricultural workforce. In this study, students were asked to rate their competence associated with industry-validated technical and professional skills before and after completing Ag 450. During the course, students were provided agricultural instruction which included technical agricultural activities designed to foster experiential learning. The retrospective pre-post assessment indicated that after students completed the capstone course, they are better prepared to enter the workforce at the intermediate skill level and somewhat agree that they are professionally ready to enter the workforce and meet the needs of industry. The findings of this study also imply the experiential learning-based agricultural experiences

provided in this course are bolstering students' self-perceived competence related technical and professional skills.

Recommendations and Implications

Further research in this area is needed to better understand how the instruction and materials of Ag 450 may be augmented to further enhance the growth of students' professional and technical skills sets. This study is currently limited to one semester and should be replicated for further data. Although the results of this study show students are rating themselves as having an intermediate level of competence related to technical skills, an implication should not be made that the graduates from this 4-year program have obtained mastery in any sector of the agricultural industry. The industry-identified skills provided on this instrument were noted by the experts to be entry-level skills needed by graduates to attain employment in the agricultural industry. Thus, if students are able to enter the workforce with an intermediate understanding, which is higher than 50% on this particular scale, they should be able to be an effective, skilled worker with room to grow. As an entry-level employee continues in the workforce, they should improve their skill level to advanced and expert competencies. This study may be replicated at other universities and agricultural programs in order to address the effectiveness of curricula and determine the career preparedness of their students. This study may also be broadened to look at a larger range of technical and professional skills which may be more relevant in different parts of the country.

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Examining secondary talented and gifted and agricultural education
experiences relative to college major and career choice

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Introduction

In recent decades, the agriculture industry has become technologically advanced and increasingly complex (Cannon, Broyles, & Hillison, 2006; Cannon, Broyles, & Anderson, 2009). The shift in agriculture results in a change of requirements for employability in college graduates. As a result, students with a diverse background have to be sought out. Examples of diverse student populations may include but are not limited to the talented and gifted (TAG) population and individuals with an array of agricultural education experiences.

Theoretical/Conceptual Framework

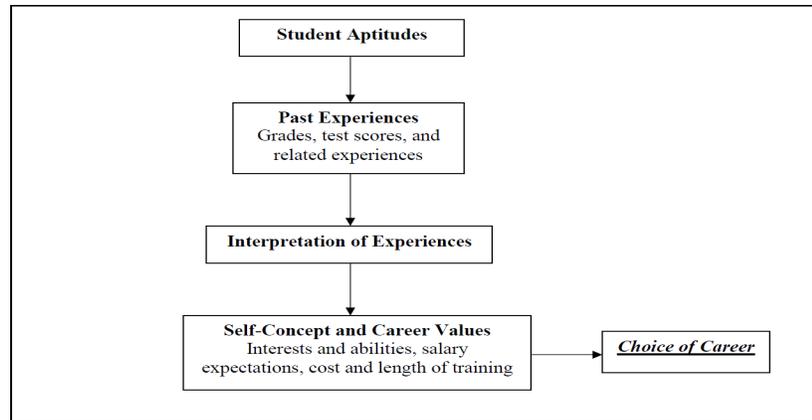


Figure 1. Model of career choice. Adapted from “Factors and influences on high school students’ career choices,” by T.P. Dick and S.F. Rallis, 1991, *Journal for Research in Mathematics Education*, 22(4), 281-292.

Purpose and Objectives

The specific objectives of the research were to:

1. Determine characteristics of the participants used in this study.
2. Describe the participant’s level of involvement in secondary talented and gifted programs, secondary agriculture programs, or a combination of both.
3. Examine how a student’s past experiences influenced their major choice in agriculture and natural resources by involvement in talented and gifted programs, agriculture programs, or a combination of both.
4. Determine how self-concept factors pertain to the participants’ expectations of a career in agriculture, food, and natural resources.

Methods/Procedures

The target population of this study consisted of undergraduate students enrolled in agriculture majors at Kansas State University during the spring 2019 semester. The accessible population for this study consisted of 2,193 students. The responding sample consisted of 378 participants with a 17.23% response rate. This study’s survey results were analyzed using descriptive statistics, comparisons, and t- tests using the software IBM SPSS Statistics, version 25. The significance level was determined at 0.05.

Findings/Results

Males comprised 29.9% of the total and females comprised 70.1% of the total respondents. The majority of respondents indicated that they were in their third year of college ($n=114$). Out of the total 378 respondents, 115 students (30.3%) indicated Animal Science and Industry as their major. One hundred twenty-nine respondents indicated they had experiences with a TAG program. There were 202 participants in this study who indicated they were involved in an agriculture program. Seventy-one participants indicated he or she had experience with both a TAG and an agriculture program.

A five-point Likert-type scale was used to indicate the level of influence each factor had on a future career choice. The rating “5” indicated “Extremely Important,” a rating of “3” indicated “Moderately Important,” and 1 indicated “Not at all Important.” Each experience with a mean score of 3.0 or greater was considered influential. The TAG respondents indicated that the curriculum factor ($M=2.92$) did not impact their major of study choice. The agriculture and both programs groups indicated that all seven of the factors were influential with means greater than 3.0. Work experiences across all three groups was the most influential. The least influential factor differed among the groups.

A series of 18 questions with a five-point Likert-type scale was utilized to indicate the level of expectation each group had with a future career. The rating “5” indicated “Extremely Important,” a rating of “3” indicated “Moderately Important,” and 1 indicated “Not at all Important.”

The talented and gifted group ($n=89$) indicated that “use all my skills and knowledge” was the most important factor for a future career ($M=4.45$, $SD=0.63$) and “do risky things” ($M=2.60$, $SD=1.07$) was the least important. The non-talented and gifted group ($n=159$) indicated that “develop as a person” was the most important factor for a future career ($M=4.32$, $SD=0.79$) and “tell others what to do” ($M=2.83$, $SD=1.10$) was the least important.

The agriculture group ($n=148$) indicated that “develop as a person” was the most important factor for a future career ($M=4.44$, $SD=0.66$) and “do risky things” ($M=2.76$, $SD=1.22$) was the least important. The non-agriculture group ($n=97$) indicated that “develop as a person” was the most important factor for a future career ($M=4.32$, $SD=0.79$) and “tell others what to do” ($M=2.71$, $SD=1.13$) was the least important.

The both program group respondents ($n=55$) indicated that “use all my skills and knowledge” was the most important factor for a future career ($M=4.49$, $SD=0.61$) and “do risky things” ($M=2.53$, $SD=0.96$) was the least important. The not in both programs group ($n=190$) indicated that “develop as a person” was the most important factor for a future career ($M=4.39$, $SD=0.75$) and “do risky things” ($M=2.78$, $SD=1.20$) was the least important.

Discussion, Conclusion, & Recommendations

In the TAG and agriculture classrooms, educational programming for students with exceptional abilities is currently driven by acceleration, ability grouping, and enrichment (Feldhusen, 1989). 1) Acceleration in the classroom provides opportunity to work self-paced through the standard curriculum. 2) Ability grouping and is collected based on a student’s mastery level of instruction. 3) Enrichment can be defined as any activity outside of the regular curriculum that is provided in the formal educational setting (e.g., field trips, independent projects, and science projects).

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Alternatively Certified Teachers' Decisions to Teach in School-based Agricultural Education Programs

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Introduction

Teacher shortages have been a perpetual issue for school-based agricultural education (SBAE) programs for many decades (Kantrovich, 2010). This chronic shortage beckons the need to for recruitment efforts and the development of a deeper understanding of why candidates choose to enter, or not enter the SBAE teaching profession (Stripling & Ricketts, 2016). Previous research has outlined various factors which influence individuals to choose SBAE as a career choice. Specifically, factors such as previous involvement in SBAE programs in high school (Edwards & Briers, 2001; Ingram, Sorensen, Warnick, & Lawver, 2018; Lawver & Torres, 2012), encouragement from SBAE teacher to pursue agricultural education (Ingram et al., 2018; Lawver & Torres, 2012; Park & Rudd, 2005), passion for the agricultural industry (Ingram et al., 2018; Lawver & Torres, 2011, 2012; Marx, Smith, Smalley, & Miller, 2017), and a desire to positively impact students (Ingram et al., 2018).

Previous agricultural education literature indicated the extreme shortage of SBAE teachers has bolstered the number of alternative certification teachers which join the profession (Bowling & Ball, 2018; Marx et al., 2017). Alternative certification pathways are designed for individuals who do not have a baccalaureate degree in education. "The individuals are often certified based upon work experience, completion of coursework, or completion of a baccalaureate degree in the subject area they were hired to teach" (Ruhland & Bremer, 2002a, p. 2). Ruhland and Bremer (2002a) stated 28% of the 632 CTE teacher respondents indicated they were certified through alternative certification.

While a multitude of research has been conducted on the quality of instruction provided by alternatively certified teachers (Roberts & Dyer, 2004; Robinson & Edwards, 2012), research is needed to understand why alternatively certified teachers did not take the traditional route of certification (Bowling & Ball, 2018; Marx et al., 2017). Moreover, Marx et al. (2017) indicated the need to understand alternatively certified teachers' decisions to enter and remain in the profession.

Theoretical/ Conceptual Framework

The factors influencing teaching choice (FIT-Choice) model served as the framework for assess alternatively certified teachers' decisions to become SBAE teachers. The FIT-Choice model provides insight on motivational factors (i.e., altruistic-type, utilitarian, intrinsic, and ability-related belief motivations) associated with an individual's decision to become a teacher (Watt & Richardson, 2012). The model is divided into two main motivational factors, positive motivations (i.e., task demand and return, perceptions of teaching self-efficacy, personal and

social utility value) and negative motivations (e.g., choosing teaching as a fallback career choice; Watt & Richardson, 2007, 2008, 2012). According to Watt and Richardson (2012), the FIT-Choice framework provides a means for evaluating motivations of various individuals, from different settings, and to “explore correlates and consequences of motivational dimensions” (p. 188).

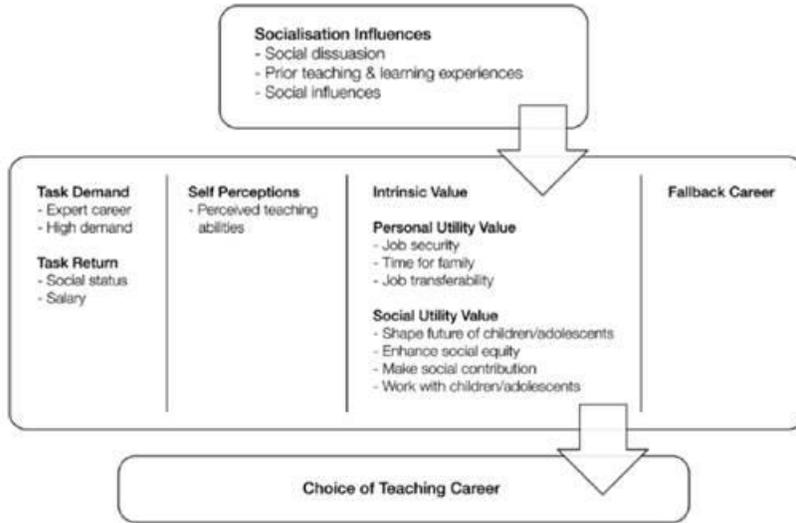


Figure 1. FIT-Choice empirically validated theoretical model (Watt & Richardson, 2012)

Marx et al. (2017) noted the need to determine why alternatively certified SBAE teachers didn’t chose teaching in the first place and better understand their motivations for joining the profession. In the context of this study, the FIT-Choice framework served as a means to assess the nature of their motivations (i.e., negative or positive) associated with the decision to teach.

Purpose and Objectives

This research study specifically focuses on alternatively certified teachers’ decision to teach in school-based agricultural education programs. This qualitative study aimed to examine the self-reported perceptions of agricultural educators entering the profession through alternative means. The objective was to explore the decision and reasoning resulting from the choice to pursue a career in agricultural education.

Methods

Interviews were conducted in this case study which contained questions, which focused on experiences that made you decided to become a SBAE, experiences as a SBAE, and previous career experiences. The questions were open-ended and were not leading (Malhotra, 2006). Emails for participants were obtained from a list of alternatively certified teachers ($n = 18$) from the State Department of Education. Initial emails included the objectives, informed consent, and options for a phone interview time. Follow up emails were sent to non-respondents. Phone interviews were conducted, and a basic audio recording device was used to record the interviews and field notes were taken.

After the interviews were conducted, the researchers transcribed interviews verbatim and were sent back to the participants to check for accuracy. The transcribed interviews were analyzed and coded individually by researchers (Braun & Clark, 2006). The transcriptions helped the researchers identify significant statements, develop descriptions, and recognize parallels among the participants and their responses (Creswell, 2013). Once researchers individually coded the data, notes were compared, and themes identified (Braun & Clark, 2006). Credibility, trustworthiness, and reliability were ensured by utilizing research logs, peer review of study data, and member checks (Lincoln & Guba, 1985).

Further, as researchers our diverse backgrounds and roles in the agricultural teacher education program provide for a variety of expertise and interests in teacher seeking means for alternative certification. Researchers teach agricultural education coursework and provide supports for teachers entering the profession through alternative means. One researcher serves as the Agricultural Teacher Education Coordinator and is directly involved with supporting professionals.

Findings

Eight of the eighteen alternatively certified agricultural education teachers in South Dakota participated in this study. The teachers were evenly split by gender and four had career(s) prior to teaching, while the other four began teaching agriculture in a middle school and/or high school after graduating. Five of the teachers were from traditional farming backgrounds and five of the teachers were actively involved with school-based agricultural education when they were in high school. Participants were asked how and why they began teaching and as a result four themes emerged from the data. The themes are highlighted below:

No Plan to Teach but the Opportunity Arose

All eight participants stated they were not planning on teaching agriculture after graduating college. Participants indicated their main reason for choosing agriculture was because the opportunity arose. The opportunity presented itself in many ways, from family and community support to a life event that pushed them towards a high school agriculture position.

Spencer said, "I wasn't certified, but emailed the school and offered to be a long-term sub. The school worked with the state to get me started on alternative certification." Lisa recounted a similar situation and said, "My husband suggested I talk to the school to see if they would be interested in hiring me. After talking with a few people I learned that I could get my teaching certification after college while working." Sarah explained, "I was heading back to my hometown after graduating college to work on the family ranch... I was then approached to teach." Wesley explained, "I had a rough week at [work] and when the principal called me, I had enough and went to teaching... I choose it because a door opened."

Enjoy Teaching

Despite not having a plan to teach agriculture and having not completed a formal agricultural education certification program in college, the participants felt satisfied with the decision to teach. Several of the participants explicitly stated they enjoyed teaching.

Adam recounted, “I could have earned more money doing anything else, but I wanted a job that I found interesting... I enjoy working with kids, and I really enjoy learning.” Wesley and Ryan both individually said, “I love teaching,” and Spencer stated, “I love what I do... This is my full-time job and passion.” Lisa indicated, “...though [teaching agriculture] was not a plan of mine until [the school] offered me the job, I am extremely happy in the decision I made,” and Emily stated, “I cannot imagine doing anything else.”

Regret not Being Certification Sooner

The participants’ enjoyment of teaching agriculture was also evident in their regret for not becoming certified to teach sooner. None of the participants initially finished a degree in agricultural education during college, and thus were not certified to teach agricultural education upon graduation. Participants clearly stated they regretted not becoming certified to teach sooner.

Ryan explained, “I knew it was something that always interested me, but I never made it my major in college. That is something I regret.” He went on to say, “I like the career choice I made, and just wish that I had made that choice in college and not after I graduated.” Spencer had previously majored in agricultural education prior to switching to agricultural business. He said, “I do regret not finishing out my Ag Ed degree. I have learned a lot in the six years I’ve taught and have worked hard to fill in the blanks on what I missed out on.”

Passion for Youth and Agriculture

While the participants were not directly asked if they were passionate for youth and agriculture, all participants eluded to it. Regardless of the participants’ backgrounds, teaching experience, and path to education, they all had a passion for youth and agriculture.

Sarah explained, “I’ve always been passionate about learning and agriculture although I never imagined teaching.” Alex made the switch to agricultural education because he wanted to “have an impact on students and show them the opportunities that are out there.” Adam said, “I choose [agricultural education] because I enjoy working with kids and ... learning about plants, animals, and mechanics, and then taking that information and trying to distill it into something that students understand.” When Lisa heard the local high school did not have an agricultural education teacher, she pursued the position. She said, “It was extremely important for the young people of such an agriculture-based community to get some agriculture education in high school.”

Conclusion/Recommendations/Implications

The intent of this study was not to generalize the results to all teachers who have been alternatively certified. Overall, participants indicated they enjoyed teaching agricultural education despite not having the plan or formal education to teach. Participants were glad they chose to pursue their passion for youth and agriculture by teaching agriculture once the opportunity to do so arose. However, many participants regretted not becoming immersed in the profession earlier in their careers. The motivational factors noted by the teachers closely aligned

with the positive motivational factors included in the FIT-Choice model (Watt & Richardson, 2007, 2008).

While the alternatively certified teachers expressed moderate levels of teaching self-efficacy and perceived social utility value to be linked to their teaching decisions, it is important to understand the uniqueness of these teachers when considering their professional development needs (Smith, Lawver, & Foster, 2017). Previous research studies have recommended that professional development for alternatively certified teachers should have a strong focus on foundational pedagogical principles (e.g., classroom management) and the integration of FFA activities in agricultural education programs (Roberts & Dyer, 2004; Schonfeld & Feinman, 2012). Alternatively, certified educators need opportunities to account for the lack of formal agricultural education, such as a professional development in the form of a mentoring program. Mentoring programs that “provide trained mentors who have the time and resources to plan lessons with candidates, share curricula, demonstrate lessons, and provide feedback after frequent classroom observations” are highly effective (Humphrey, Wechsler, & Hough, 2008, p. 2). Support throughout the first few years of teaching has been shown to positively impact teachers’ experiences in the profession (Ruhland & Bremer, 2002b).

Providing alternatively certified teachers with a formal mentor in another agricultural education program, as well as a local CTE educator as a supplemental mentor could be beneficial. Future research should be conducted in areas of pedagogy that alternatively certified teachers struggle the most with. A long-term mentoring program or induction program which lasts for at least five years could be beneficial for alternatively certified educators. While professional development is a great way to further improve both alternatively certified and beginning educators, professional development may need to be tailored differently to the two groups.

Moreover, it is important to further explore the decisions of individuals to become alternatively certified agricultural education teachers to better understand socialization influences (i.e., social dissuasion, prior teaching experiences, and social influences) and other factors which drove these individuals to join the teaching profession (Watt & Richardson, 2012). While teachers in this study indicated a degree of regret for not obtaining certification sooner, the “fallback” career subscale of the FIT-Choice model should also be further explored to gain insight if the alternatively certified teachers truly ended up teaching due to failures to succeed in their first-choice careers.

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Science Efficacy of Agriculture Education and Science Teachers Participating in a Professional Development Program

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Introduction

In the 2016-2017 Education Profile for the State of Nebraska in the Assessments Category, Nebraska has decreased their proficiency in science since 2012-2013 and currently, 30% of students lack proficiency in science (Nebraska Department of Education, 2017). These figures are based on the 47,059 students that were tested that make up 99.84% of the student population that is eligible for testing. More alarming, students are gradually decreasing in proficiency between 5th grade, 8th grade, and 11th grade. In 2017 28% of 5th graders were below proficient, 32% of 8th graders were below proficient, and 39% of 11th graders were below proficient (Nebraska Department of Education, 2017). Proficiency scores indicate that science efficacy needs to be addressed at all grade levels, but specifically in high school. Based on research and theory, it is determined that science teaching outcome expectancy (STOE) and personal science teaching efficacy (PSTE) are complementary factors in determining the success of teachers in a science-based classroom (Stripling & Roberts, 2013).

Theoretical/Conceptual Framework

Through research, it is believed that a teacher's self-efficacy relates to progressive teaching behaviors and positive student outcomes. This is based on the social cognitive theory (Bandura, 1977). This theory identifies the capabilities of humans, and their purposeful intentions that can and will affect their course of action. This process called triadic reciprocal causation was developed by Albert Bandura (1977, 1997). Triadic reciprocal causation is a model that suggests three interrelated factors: environmental, behavioral, and personal factors. These three factors combined will determine what a person believes about themselves and aide in their decision-making process. This model advocates that not one single factor determines a person's behavior, instead it is the combination of all three factors. In short, a person's self-efficacy will be based on their perceived abilities.

Purpose and Hypothesis

The purpose of this study was to investigate the teachers' level of science efficacy in the agricultural education and science classrooms and compare the results as the educators progressed through a professional development (PD) program. The specific objectives of this study were to increase the agriculture and science teachers and to increase their STOE after participating in a PD program. Two hypotheses were used to guide this inquiry:

1. There is no significant difference in the PSTE of agriculture and/or science teachers before and after the professional development and implementation of curriculum
2. There is no significant difference in the STOE of agriculture and/or science teachers before and after the professional development and implementation of curriculum

Methods/Procedures

Professional Development

The program provided an opportunity for secondary agriculture and science teachers to participate in PD over 12 months. The PD was divided into three phases.

Phase I. The PD program began in summer 2017 with a two-day workshop that took place at three different locations throughout Nebraska. The workshop introduced information centered around how students learn, more specifically, experiential learning, short-term and long-term memory, Bloom's taxonomy, and learning styles. From there, inquiry-based teaching/learning methods were introduced. All learning activities that were developed and used in this PD incorporated inquiry-based learning methods and allowed teachers to experience learning activities as students.

Basic scientific disciplines including biology, chemistry, and mathematics are interrelated in the growth and development of living beings. For this reason, scientific units of study that focused on the Scientific Principles of Food Animal Systems were developed. Each unit provided basic content knowledge, hands-on inquiry-based learning activities, and student reflection instruments. Content knowledge included educational videos and PowerPoint slides that could be used to introduce students to the topic, provide the scientific basis of the topic and related activities. All such materials were also included instructor notes.

Finally, through inquiry-based learning, it is imperative that students be asked to reflect upon what they've just learned; to evaluate the results and to project how those results might relate to new situations or scenarios (Kolb, 1984). To facilitate this final component of inquiry-based learning, instruments were developed to encourage students to reflect upon what they learned and how the new knowledge may be applied to different situations in the future.

Phase II. The program continued throughout the 2017-2018 academic year. Conference calls through Zoom (video conferencing platform) took place in August and December of 2017, and April of 2018. The calls were used to discuss how participants were implementing the prescribed learning activities that focused on genetics, muscle biology, microbiology, and nutrition through inquiry-based learning techniques.

Phase III. In June 2018, original participants were asked to return for a follow-up PD session. Selected participants were asked to lead instruction over the inquiry-based learning activity they developed during the previous school year. The overall purpose phase III was to help life agriculture and science teachers to learn how to develop their own inquiry-based learning activities, and to share such activities with a broader audience.

Additionally, quantitative methods were used during phase III to determine the change in teachers' science teaching efficacy by using a modified science teaching efficacy scale (Enochs & Riggs, 1990). The Science Teaching Efficacy Belief Instrument (STEBI) created by Enoch & Riggs (1990) was modified and used to measure the self-efficacy of agriculture teachers and science teachers.

Data Collection

The STEBI consisted of 23 questions scaled from 1 (strongly disagree) to 5 (strongly agree). Terminology was adjusted by researchers to accommodate for high school teachers. (Riggs & Enoch, 1989). The target population was agriculture and science teachers in high schools across Nebraska. There were 27 participants at the start of the PD. For the purpose of this particular analysis, 10 participants were used due to 17 participants not completing all three phases of the PD.

Data were collected from 10 agricultural education and science teachers. The STEBI (Enochs et al., 2000) is comprised of two scales that measure the constructs personal science teaching efficacy (PSTE) and science teaching outcome expectancy (STOE). Based on Enoch, Smith, and Huinker (2000), PSTE is defined as self-belief in one’s ability to teach science, and STOE is defined as one’s ability to bring about a desired learning outcome as a result of scientific instruction. The PSTE scale consists of 13 items, and the STOE scale consists of 8 items. All items use a 5-point rating scale (1 = strongly disagree to 5 = strongly agree).

Data Analysis

Data was summarized using descriptive statistics (i.e., frequencies, percentages, and means). Paired samples t tests were utilized to determine if a significant difference existed in science teaching efficacy and outcome expectancy (STOE). Data were analyzed using IBM SPSS version 20. Descriptive statistics (i.e., frequencies, percentages, and means) were used to describe the PSTE and STOE data. Based on Enoch et al. (2000), low, moderate, and high self-efficacy was defined as 1.00 to 2.33, 2.34 to 3.67, and 3.68 to 5, respectively.

Additionally, Enoch et al. stated reliability analysis produced Cronbach’s alpha coefficients of .723 for PSTE and .749 for STOE. Construct scores were calculated by computing a summated mean of corresponding items after reverse coding items 3, 6, 8, 15, 17, 18, 19, and 21. Post-hoc reliabilities for PSTE and STOE were .799 and .732, respectively. These measures of internal-consistency are acceptable given the nature of the constructs and present reliabilities on comparable measures (Ary et al., 2014).

Findings/Results

The objectives were to determine the level of PSTE and STOE of the professional development participants before and after the PD. During the first phase of the study, teachers reported before the PD, they had a mean PSTE score of 3.83 (SD = .27) and an STOE of 3.35 (SD = 0.48). The second phase conducted after the 12-month PD teachers reported an increase in both areas with a mean PSTE of 3.95 (SD = 0.33) and an STOE of 3.47 (SD = 0.47). Means and analysis results for the surveys are presented in Table 1, Table 2, and Table 3.

*Table 1
Personal Science Teaching Efficacy Scores (PSTE)*

			Low		Moderate		High	
	M	SD	f	%	f	%	F	%
Pretest	3.83	0.27	0	0.0	3	30.0	7	70.0
Posttest	3.95	0.48	0	0.0	1	10.0	9	90.0

Note. 1.00 to 2.33 = low efficacy, 2.34 to 3.67 = moderate efficacy, 3.68 to 5 = high efficacy.

*Table 2
Science Teaching Outcome Expectancy Scores (STOE)*

			Low		Moderate		High	
	M	SD	f	%	f	%	f	%
Pretest	3.35	0.48	0	0.0	6	60.0	4	40.0

Posttest	3.48	0.47	0	0.0	6	60.0	4	40.0
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Note. 1.00 to 2.33 = *low efficacy*, 2.34 to 3.67 = *moderate efficacy*, 3.68 to 5 = *high efficacy*.

Table 3

Summary of Paired Samples t tests

	Mean difference	SD	SE	t	P
PSTE posttest – pretest	.11	.20	.06	1.79	.11
STOE posttest – pretest	.13	.51	.16	.79	.45

High scores on the PSTE suggest a strong belief in one's ability to teach science. High scores on the STOE indicate high expectations of the outcomes of science teaching. Paired t-tests were run on the pre and post survey scores for the PD. The PSTE and STOE section, scores were analyzed separately. Therefore, all analyses of group mean differences were done as two tailed tests. Analysis of surveys from the PD indicated no significant pre/post shifts on PSTE or STOE scores, but because of the small actual mean differences this does not seem to be of practical significance. Thus, the null hypotheses were not rejected.

Conclusion

The purpose of administering the modified STEBI (based on Enochs & Riggs, 1990) was to investigate teachers' level of science efficacy in the agricultural education and science classrooms and compare the results as the educators progressed through the professional development. PSTE increased from pre and posttest approximately one year after the initial PD scores. Science teacher STOE also changed during the PD.

Analysis revealed a .11-point increase in PSTE, a .13-point increase in the STOE. However, the mean differences were not statistically significant. Thus, the null hypotheses were not rejected. Results of this study indicate that the Increasing Scientific Literacy through Inquiry-Based Professional Development may be used as a tool to increase PSTE and STOE in agricultural educators and science teachers, but a larger sample of participants is needed to determine if there is a significant difference. PD opportunities for agriculture and science teachers may help to address a need in Nebraska by preparing teachers to better educate students in science, thus increasing standardized test scores (Nebraska Department of Education, 2017). Additionally future PD opportunities will take environmental, behavioral, and personal factors (Bandura, 1997) into consideration in an effort to further increase self-efficacy.

This study found agricultural education and science teachers were moderately efficacious in their ability to teach science concepts before and after the conclusion of the PD. However, 20% of the agricultural education and science teachers in this study were moved from moderate to high efficacy with PSTE. According to Bandura (1997), self-efficacy influences behavior. Thus, theoretically, being highly efficacious in PSTE should positively impact the teaching of contextualized science in agriculture and science programs; on the other hand, being moderately efficacious may negatively impact the teaching of contextualized science, potentially contributing to attrition rates as posited by Ingersoll (2003). Future research should be conducted to determine why approximately an equal number of teachers are moderately or highly efficacious in PSTE and to determine if moderate self-efficacy negatively impacts the teaching of contextualized science.

In regard to STOE, a majority of the agricultural education and science teachers were moderately efficacious in STOE. Being moderately efficacious in STOE may negatively impact the teaching of contextualized science. This said, research will also aid the planning of professional development for agricultural education and science teachers and can be used to guide experiences offered in agricultural and science teacher education programs.

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Transitioning from Mid-Career to Veteran Teacher Status

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Introduction

The current shortage of classroom teachers is not a new phenomenon. Retaining current classroom teachers, particularly those in Career and Technical Education (CTE), should play a role in addressing the shortfall. One common concern expressed by mid-career agriculture teachers, those with seven to 15 years of experience, was finding a balance between work and personal lives (Crutchfield, Ritz, & Burris, 2013; Smalley & Smith, 2017). Whereas veteran teachers, those with over 20 years of experience, noted the importance of finding a balance and protecting personal time (Clark, Kelsey, & Brown, 2014). Higher salaries and other types of financial support have a positive correlation with teacher retention (Shen, 1997). Agriculture teachers who left the profession often cited the financial incentives of working in industry as a reason for leaving (Lemons et al., 2015; Quinton, 2017).

Relationships with administrators and colleagues are associated with teacher retention. A supportive school administration is known to influence teacher job satisfaction (Morris, 2006). Clark, Kelsey, and Brown (2014) found agriculture teachers who experienced a supportive administration remained in the profession for extended periods. The importance of strong and healthy collegial relationships for career longevity should not be overlooked (Brunetti, 2006; Clark, Kelsey, & Brown, 2014; Gu & Day, 2007). Relationships among teachers are important for continued pedagogical development (Hasselquist, 2017; Johnson et al., 2011).

CTE programs are designed to be responsive to the local community's needs and thrive on community support. Veteran teachers noted a supportive community was important for their career longevity (Clark, Kelsey, & Brown, 2014; Inman & Marlow, 2004, Johnson et al., 2011). Historically, building parent and community support has been a concern for agriculture teachers (Mundt & Connors, 1999). CTE programs often have unique budgetary and facilities considerations. Having the adequate facilities and proper budgetary support to maintain them has traditionally been a stressor and can may negatively impact on teacher job satisfaction (Boone & Boone, 2009; Brunetti, 2001; Mundt & Connors, 1999; Morris, 2006; Torres, Lawver, & Lambert, 2008).

Conceptual Framework

This study was guided by Fessler & Christensen's (1992) teacher career cycle model. This framework was not used in a post-positivist manner, instead it was used to help contextualize and categorize the complex events and incidents that impact teachers over their careers. Traditionally, heavy emphasis is placed on the preservice stage of career development (Fessler & Christensen, 1992). However, more attention should be paid to the types of support teachers need at all stages of their career (Rust, 2010). The current study is designed to examine the teacher experience between the stages of *career frustration* and *career stability* (Fessler & Christensen, 1992) and to reveal experiences associated with career longevity.

Purpose

The primary purpose of the study was to examine the factors associated with Career and Technical Education (CTE) teacher retention in a rural Midwestern state. It is important to explore the experiences of mid-career (7-15 years) and veteran (20+ years) teachers to better inform preservice and in-service CTE teacher programming. The guiding question for this study was: What experiences are impactful for CTE teacher career longevity?

Methods

This study is part of a larger data set and the methods may be similar or identical to methods used in extensions of this study. This instrumental case study (Creswell, 2013; Stake 1995) focused on mid-career (7-15 years of experience) and veteran (20+ years of experience) CTE teachers. The bounded system for this study was CTE teachers, members of South Dakota Association for Career and Technical Education (ACTE), attended the summer 2018 state ACTE conference, and had the appropriate years of experience.

Data was collected in two focus groups. A total of 16 individuals participated in this study. The mid-career group was made up of four individuals, three agriculture teachers and one family and consumer sciences teacher. The veteran group had 12 participants, nine agriculture teachers, two family and consumer science teachers, and one Arts, AV technology, and communications teacher. The semi-structured interviews lasted approximately one hour and were recorded and transcribed. Line by line coding was used to identify categories and themes related to the group's experiences. Trustworthiness was ensured through member checking, peer debrief, and an audit trail (Creswell, 2013; Stake 1995). The researchers reflexively positioned themselves as former CTE teachers.

Once themes were identified for each data set, findings were compared between mid-career and veteran teachers' experiences. The researchers used teacher retention experiences from literature as a structure for the discussion. Information related to those developmental experiences from themes in the original data sets were extrapolated to expose the gaps between mid-career and veteran teacher's experiences.

Results

This section compares the mindsets of mid-career teachers and veteran teachers regarding several developmental experiences found in teacher retention literature.

Balance and Shifting Priorities/Focus

Teachers' developmental experiences in relation to finding a balance has been frequently documented in the literature. The mid-career teachers in this sample were still trying to reconcile their career values with decisions related to time and energy invested outside of school hours. One teacher shared, "You want every opportunity for your students that's the problem. They [college] don't teach the restraint". All recognized that time is a commodity that needs to be

carefully spent. One teacher commented, “that is why figuring out what to spend your time on as you have some experience it’s a little bit easier because that time is so valuable.”

The veteran teachers addressed the concepts of balance and priorities from a matured perspective. One said, “you realize that things come and go, like what was a crisis to you when you were in year two is [now] a minor little blip on the radar” She went on to say, “a teacher will let a bad class run them out of teaching, heck those kids are gone in four years, four years is nothing . . . I think perspective brings a lot of that when you realize that these things that you are stressing over really aren’t that big of an issue.”

Relationships with Administrators

Three mid-career teachers expressed frustration and disappointment with school administration. Three agreed that part of the issue was administrations’ “lack of understanding” and held misconceptions related to the CTE programs. They wished administration “had their back” more often. Another mentioned that he felt that veteran teachers were treated better by administration. “[veteran teachers] are telling you about the things that they are doing, and you’re like ‘my administration would never let me do that’.”

Veteran teachers appeared less fearful of approaching administration to fight for their programs. A veteran teacher shared her sentiments related to program advocacy. She said, “I am a pain because I’ve advocated for my program. . . if we don’t advocate for our programs and we don’t make people aware of what we offer and what we need who else will?” Some noted that when communicating with administration it was wise to “choose the right battles” and then be willing to advocate strongly for what you believe in. Another important lesson shared by a veteran teacher was, “the first thing need to do is do your job and do it very well. The kids you have in your program and their parents will over time will build on that”

Collegial Relationships

All the mid-career teachers mentioned the importance of relationships with other CTE professionals. One specifically noted the importance for finding a mentor, “its finding the support system . . . I think its people that you can relate to and you feel comfortable talking with.” One credited his CTE network with staying in the profession. “I think one of the reasons why I’m still teaching . . .is having that connection.” Despite having those networks and support systems, it can still be isolating to sometimes be the only CTE teacher in their schools. “And in other areas of education you have a math group, an English group, a science group, we are generally departments of one. . . I definitely feel like an island.”

When making the transition from mid-career to veteran teachers, the veterans teachers discussed how the relationships deepened into something more than just a professional network. They often referred to it as a “family”. One teacher said, “I really like the network of teachers and the family that is created whether that Ag Ed family or the FACS family that you have beyond the school.” Another teacher focused on how she believed CTE was unique, “I believe

that's what makes being a CTE teacher special over just over any teacher, the comradery that develop because we do know each other."

Community Support

Little was said about community support in the mid-career teachers' focus group. However, the veteran teachers had a good deal to share about lessons learned about the importance of community support to the success and well-being of a CTE program. One teacher stated, "don't worry about the moms and dads, worry about the grandma and grandpas." Another concurred, "the older people in the community they are the ones that vote." One veteran teacher connected community support with school administrators recognizing CTE programs are worth maintaining. She commented, "the business community sees kids come out with work skills." She went on to say, "[the principal] has people within the community write notes, that say 'your kids did a really good job' and so he sees that."

Finances

While finances were not discussed much by either sample. Three mid-career teachers made comments related to money. One teacher commented but I've always felt it's a calling and I don't do it for the money, I don't do it for the glory, but you do it for the students and becomes who you are." While veteran teachers recognize that business and industry has better paying jobs, they often commented on the pride they feel in making a positive difference in the community. A gentleman who left teaching only to return to the classroom commented, "...I realized that as relaxing as it was to go farming, it wasn't my passion and I realized I missed working with those kids and missing those opportunities, advancing those kids."

Discussion

Mid-career teachers believed administration could either stand in the way or support innovation, the veteran teachers viewed their interactions with administration as a sign of professional dedication. The veteran teachers focused on the need to advocate for their programs and were more confident that their programs made a difference. The mid-career teachers did not mention taking on the role of an advocate. However, learning to advocate early on may help mid-career teachers through *career frustration* (Fessler & Christensen, 1992) since administrative support has been positively correlated with teacher retention (Clark, Kelsey, & Brown, 2014).

The importance of networking was apparent to both groups. Mid-career teachers focused on the need for mentoring and the importance of building a trusted professional network. The veteran teachers were more explicit in describing their CTE network as a "family". Since relationships between teachers are important for continued pedagogical development (Hasselquist, 2017; Johnson et al., 2011), professional organizations should continue to provide professional development opportunities for CTE.

Finances were not discussed much by either group of teachers, but when it was discussed it was described as an issue that was not on the top of the values list. The lack of emphasis on salary and financial is divergent of literature (Boone & Boone, 2009; Brunetti, 2001; Lemons et al., 2015; Mundt & Connors, 1999; Morris, 2006; Quinton, 2017; Torres, Lawver, & Lambert, 2008).

Recommendations for practice include having mid-career teachers develop long-term program goals to help them approach teaching for a more holistic prospective. Mid-career teachers should also be encouraged to take on an advocacy role with administration. Professional organizations could also provide additional advocacy ideas and resources to help mid-career teachers promote their programs in the local communities. Future research should explore how variables related to burnout and attrition influence both mid-career and veteran teachers' intentions to stay in the classroom.

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Win, Lose, or Draw: Games in AFNR Education

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Win, Lose, or Draw: Games in AFNR Education

Introduction

The increasing complexity and collaborative-nature of our world, for which learners must be prepared to succeed within, starkly contrasts traditional, lecture-based learning environments (Teplitski & McMahon, 2006). In lieu of traditional, expository approaches to education, scholars advocate for team-based, experiential, and problem-centered instruction (King, Dordel, Krzic, & Simard, 2014). One teaching method which embodies these essential characteristics is educational games. Games are defined as “goal-directed competitive [activities], conducted within a framework of agreed upon rules” (Ranchhod, Gurau, Loukis, & Trivedi, 2014, p. 76). Educational games generate experiences for students, build conceptual understanding, help students develop skills, and attend to the affective domain of learning (Cohen, 2011; Fox & Loope, 2007; Hague, 2011; Jin, Bierma, & Yang, 2016). While existing literature showcases both the growing need for and potential value of games, research within agriculture, food, and natural resources (AFNR) education contexts has not adequately explored this educational approach (Bunch, Robinson, Edwards, & Antonenko, 2014; Jin et al., 2016; King et al., 2015). Given the novelty of educational game-based research within AFNR education, the current study serves as a foundational investigation of secondary school AFNR teachers’ perceptions of games. The knowledge gained through this investigation will provide useful insights regarding the value and utility perceived by AFNR educators concerning the inclusion of games within secondary school AFNR curriculum.

Theoretical Framework

The theoretical framework is the input, environment, and outcomes (IEO) model, initially used in postsecondary education research (Astin, 1999). This model illustrates individuals have measurable attributes (i.e., inputs) as they engage in an experience. Additionally, the model suggests experiences catalyze change among individuals, measured as outcomes of the experience. For example, individuals walk into learning experiences with pre-existing knowledge and attitudes about the topic (i.e., inputs) and, because of the experience, their knowledge and attitudes change about the topic (i.e., outcomes). In the current analysis, we operationalized the IEO model by evaluating perceptions of games (i.e., inputs) before a professional development session (i.e., experience) and then compared those perceptions to perceptions after the professional development to better understand participant outcomes.

Purpose and Objectives

The purpose of this study is to understand the perceptions of school-based AFNR educators regarding games as well as evaluate these perceptions before and after a professional development experience. This purpose was achieved via the following research objectives: (a) evaluate AFNR teacher perceptions of games and (b) compare AFNR teacher perceptions of games before and after engagement in a professional development session focused on games.

Methods

Data utilized in the current study were derived from a larger, multi-methodological research project exploring game usage within AFNR education.

Population, Sample, and Data Collection

The population included all Michigan school-based AFNR educators who participated in a professional development session titled “Game On School-Based Agricultural Education: Using Interactive Games to Enhance Student Learning” offered during the Michigan Fall Professional Development Institute (PDI). Paper surveys and writing utensils were distributed immediately before and immediately after the 90-minute professional development session to all participants ($N = 63$), which totaled 60% of attendees at the Michigan Fall PDI. Fifty ($n = 50$) participants submitted complete pre and post surveys, yielding a 79.37% usable response rate. Due to the purposive sampling procedures, no attempt is made to infer findings beyond respondents.

Description of Professional Development

The professional development session, facilitated by the authors of this research, included a 15-minute introduction to games and justification for using games in educational settings. Following the introduction, participants were led in playing four games titled (a) shifting systems; (b) the coopetition game; (c) seek, solve, unscramble; and (d) the photosynthesis game. After playing each game, facilitators led a debrief in which participants discussed their experiences playing the game, potential learning outcomes achievable via the game, and methods for adapting the game to meet different learning objectives.

Instrumentation

The construct used to evaluate teacher perceptions of games was adapted from Kenny and McDaniel (2011) who explored teacher perceptions of video games within classrooms. The wording of the survey was changed from video games to educational games, resulting in a more applicable data collection instrument given the focus of the current study. The survey included ten questions, included in the Findings, Table 1. Responses were recorded from a 1 (*strongly disagree*) to 5 (*strongly agree*). Face and content validity were evaluated by a panel of three experts in educational research. Reliability was evaluated post hoc, with the construct being reliable (Fraenkel & Wallen, 2000; Nunnally & Bernstein, 1994) for both the pre (Cronbach’s $\alpha = .82$) and post professional development distribution of the survey (Cronbach’s $\alpha = .81$).

Data Analysis

Means and standard deviations are reported for each of the ten items within the construct for both the pre and post professional development survey distributions. In addition, a summated mean and standard deviation is provided to compare perceptions of educational games before and after participation in the professional development.

Findings

Research objective one focuses on teacher perceptions of educational games (see Table 1). Before engaging in the professional development, teachers reported a generally positive perception of games ($M = 3.96$; $SD = 0.52$). Within the pre-survey results, respondents agreed most with the statement, “educational games can be used to teach things in the classroom” ($M = 4.38$; $SD = 0.95$). Alternatively, the item “I would rather teach in other ways than use educational games” received the lowest average response ($M = 3.68$; $SD = 0.82$). After engaging in the professional development, teachers again reported generally positive perceptions of games ($M = 4.05$; $SD = 0.47$). For the post survey, the most favorably perceived item was, again, “educational games can be used to teach things in the classroom” ($M = 4.59$; $SD = 0.61$) while “I utilize educational games on a regular basis” was the lowest rated item within the construct ($M = 3.56$; $SD = 1.03$).

Table 1

AFNR Teachers’ Perceptions of Games

Item Number	Construct Items	Before Professional Development		After Professional Development	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	Educational games can be used to teach things in the classroom.	4.38	0.95	4.59	0.61
2	I prefer to utilize games which have a strong educational meaning.	4.14	0.79	4.32	0.59
3	Educational games are too complex to learn.	4.12	0.73	4.00	0.82
4	Educational games are too time-consuming to utilize in the classroom.	4.00	0.80	4.08	0.64
5	I feel comfortable utilizing educational games.	3.98	0.74	4.26	0.53
6	The act of facilitating educational games is intimidating to me.	3.92	0.97	4.02	0.83
7	Educational games create too much conflict in a classroom.	3.90	0.93	3.84	0.89
8	The rules of educational games make them too difficult to use.	3.84	0.66	3.96	0.67
9	I utilize educational games on a regular basis.	3.74	1.08	3.56	1.03
10	I would rather teach in other ways than use educational games.	3.68	0.82	3.88	0.82
	Total	3.96	0.52	4.05	0.47

Note. Items measured from 1 (*strongly disagree*) to 5 (*strongly agree*). Items, 3, 4, 6, 7, 8, and 10 are reverse coded and are reported using reversed means.

Research objective two shifts the focus to comparing perceptions of educational games before and after participation in the professional development. Overall, perceptions of educational games increased negligibly ($\Delta M = 0.09$). Looking within the construct items, increased perceptions were seen in seven of the ten construct items (i.e., items 1, 2, 4, 5, 6, 8, and 10). The largest increase was seen for the item “I prefer to utilize games which have a strong educational meaning” ($\Delta M = 0.28$). Among those items in which a decrease was seen, the largest decrease was observed for the item “I utilize educational games on a regular basis” ($\Delta M = - 0.18$).

Conclusions and Discussion

The current study provides a foundational understanding of teacher perceptions regarding educational games and how perceptions of educational games change after participation in a professional development. Before participating in the professional development, teachers held relatively positive perceptions of educational games. Importantly, however, the teachers who responded to the survey self-selected into a professional development session focused on using games within school-based AFNR education; therefore, it is likely their perceptions were higher than those teachers who did not participate in the professional development. Nonetheless, a positive perception of games among teachers before the professional development is encouraging given the educational potential of games (Cohen, 2011; Fox & Loope, 2007; Hague, 2011; Jin et al., 2016) and alignment between game-based educational approaches and the increasing complex and collaborative world (Teplitski & McMahon, 2006).

Only negligible differences were observed in teacher perceptions of educational games after participating in the professional development. Overall, this suggests a 90-minute professional development on games, as the experience, may not suffice to cause immediate, substantial change in teacher outcomes (Astin, 1999). Alternatively, teachers may withhold changing perceptions of educational games until they receive confirmation of the value educational games possess by utilizing them with their students, a hypothesis supported by the Model of Teacher Change (Guskey, 2002) and the Diffusion of Innovations Theory (Rogers, 2003).

Although only negligible differences were observed within perceptions of educational games, closer inspection of the individual items found within the construct may illuminate valuable gains among participants. In particular, a decline in the item “I utilize educational games on a regular basis” may belie a more rigorous personal definition of what educational games are, shifting perceptions of educational games beyond the common, competitive question answering review games (e.g., Review Jeopardy). Potentially, a product of the professional development were teachers who perceived educational games as experiences which can be more complex and collaborative than previously envisioned. This idea is supported by the two largest increases in perceptions being for the items “I prefer to utilize games which have a strong educational meaning” and “educational games can be used to teach things in the classroom;” suggesting teachers, after the professional development, saw educational games as useful in the formative stages of learning as opposed to, potentially, only the summative stages.

Recommendations

Three recommendations have emerged from this research on teacher perceptions of educational games within AFNR education. First, to leverage the favorable views toward games held by teachers, those in curriculum development and instructional methods elements of teacher education are encouraged to include educational games as a teaching methodology. Second, those looking to increase the perceptions of teachers regarding educational games are encouraged to consider sustained professional development opportunities with chances for participants to “try out” games for confirmation of their educational efficacy. Further, longitudinal research is needed to assess teachers throughout their journey implementing educational games to evaluate the evolution of teacher perceptions as they try out games within their own classrooms. Finally, as interventions are initiated to increase game utilization within AFNR education, facilitators are encouraged to select games which represent the broad utility of educational games for AFNR educators. For example, games which can be used to introduce, teach, extend, and/or evaluate content learning or skill development are recommended.

Educational games provide a viable method to develop learners who can work collaboratively to solve problems (Ranchhod et al., 2017). The lack of research within educational games leaves participants throughout AFNR education without the knowledge or resources needed to make informed decisions to support expanded use of educational games. The current study provides a foundation of knowledge from which to build additional research and practice to increase the quality of instruction in AFNR education through educational games.

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