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**2017 Western Region AAAE Research Conference**

**Research Paper Review Process**

The 2017 Western Region AAAE Research Conference Call for Papers was issued via the AAAE listserv in February 2015 with a submission deadline of June 1st, 2017. Authors were invited to submit abstracts via FastTrackTM at http://aaae.expressacademic.org/login.ph.

The 2017 Western Region AAAE Research Conference received 52 abstracts from researchers and authors. Personal identifiers were removed from research papers before released to invited reviewers through the FastTrack system. Authors were notified of papers acceptance at the completion of the review process. Abstracts were blind-reviewed by designated panel of reviewers for the conference. A total of 24 abstracts were accepted for presentation.

Our appreciation to John Rayfield, the AAAE Conference Manuscript Submission and Review Manager, for providing technical assistance and overseeing the paper review process using the FastTrack system. We also want to thank the panel of reviewers for this hard work during this new system of review. Finally, thank you to all of the AAAE members for their manuscript submissions.

**2017 Western Region AAAE Research Panel of Reviewers**

Thank you to the professionals listed below who volunteered their time and expertise in the review process.

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**Western Region AAAE Research Conference History**

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| **Year** | **Location** | **Chair(s)** | **University** |
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**Western Region AAAE Research Conference History**

**(Continued)**

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| **Year** | **Location** | **Chair(s)** | **University** |
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| 2013 | Lubbock, TX | Lori Moore  Theresa Pesl Murphrey | University of Idaho |
| 2014 | Kona, HI | Scott Burris  Jon Ulmer | Texas Tech University |
| 2015 | Corvallis, OR | Misty Lambert  Jonathan Velez | Oregon State University |
| 2016 | Tuscon, AZ | Edward A. Franklin | Arizona State University |
| 2017 | Fort Collins, CO | Michael J. Martin | Colorado State University |

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**STEM Knowledge, Learning Disabilities and Experiential Learning: Influences of Sequencing Instruction**

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John Rayfield, Texas Tech University

**Abstract**

*Career and technical education (CTE) courses, including agricultural education courses, are home to a disproportionately large number of students with learning disabilities (LD). Agricultural education has been sought as a potential solution to teaching abstract STEM concepts through experiential learning methods. Abstract concepts are noted in the literature as particularly difficult for students with learning disabilities to grasp. This study was designed to describe the changes in pretest and posttest scores on STEM content tests for students when accounting for their preference for grasping information through experiential learning theory and their learning disability classification. When instruction was sequenced to match student learning preference, change scores for students with learning disabilities were increased. When instruction was opposite student preference, students with learning disabilities had lower change scores than those without an LD classification Understanding the impact of differentiating instruction for STEM concepts when instructing students with learning disabilities in agricultural education courses could be aided by incorporating components related to individual sequencing of instruction to match student preference for grasping information through. Examining students through ELT may provide a platform for mitigating the effects of learning disabilities on student achievement.*

**Introduction / Theoretical Framework**

The ability to learn is a factor of student learning referred to in almost all models examining student achievement (Bender, 2007). As all students are individuals, each has an individual aptitude and capacity for bringing in, storing, and retaining information (Sousa, 2011). Accounting for individual learning ability in education is essential within an examination of how students learn. The very definition of learning disability (LD) lends itself to the importance of using learning disability status as a factor in understanding student achievement. Bender (2008) defined a learning disability as “a condition giving rise to difficulties in acquiring knowledge and skills to the level expected of those of the same age, especially when not associated with a physical handicap” (p. 18). Although there are large differences in the types of learning disabilities classified by federal legislation, researchers have found that collectively, students classified with a LD have lower test performance and GPA than those without learning disabilities, even when the accommodations of an IEP are in place (Hampton & Mason, 2003).

One of the most common manifestations of learning disabilities is difficulty converting abstract knowledge into applied knowledge (Bender, 2007). This is an important factor for STEM education, as many of the concepts are incredibly abstract when presented without context (Stone, 2011).

In STEM fields, there are known differences in the performance of students with learning disabilities on STEM assessments (Boaler, 1998; Kieran, 1992; Woodward & Montague, 2002). This examination has led researchers to conclude that there may be a large advantage to allowing students with learning disabilities to approach abstract concepts, like those in STEM education, through applied means (Furner & Kumar, 2007; Stone, 2011). Researchers have explained the importance of examining performance of students with learning disabilities within research studies. Bender (2008) outlined the importance of ensuring educational researchers are mindful of the ways in which students with learning disabilities learn content and perform on assessments. Bender (2007) also shared the critical need to provide LD students with differentiated instruction that allows them to experience education in the teaching strategy most closely aligning with their capacity for learning. Cognitive sequencing is a way to differentiate instruction and provide assistance for students with learning disabilities, especially related to presenting information using the cognitive sequence students prefer to grasp information in first (Woodward & Montague, 2002).

CTE courses are home to a disproportionate number of students with learning disabilities (Wagner, Newman, & Javitz, 2015). In a national study of more than 9,000 public high school students with learning disabilities, 96.0% had taken at least one CTE course during their high school tenure (Wagner, et. al., 2015). To further demonstrate the broad-scale involvement of LD students in CTE courses, the study revealed that CTE courses accounted for nearly one-fifth (19.7%) of all high school credits earned by LD students (Wagner, et. al., 2015). By comparison, CTE courses only accounted for 12.8% of the total credits earned by all high school students combined (Wagner, et. al., 2015).The most accessible factor for classifying LD students is the presence of an IEP on file with the school (Bender, 2008). It is important to note that learning disabilities are varied, and that each level and type of LD has a different potential effect on student academic performance. The presence or absence of LD classification is not a perfect indicator of student academic ability, however, it can be useful in classifying students who typically need supplemental educational assistance, and therefore, have learning differences from their peers (Bender, 2007).

The foundational theory used to frame this study was Kolb’s (1984, 2015) experiential learning theory. Kolb’s model, is a “dynamic view of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction” (Kolb, 2015, pp. 50-51). This model shows the cyclical process of learning as a relationship between the four modes of active experimentation (AE), concrete experience (CE), reflective observation (RO) and abstract conceptualization (AC) as shown in Figure 1 (Kolb, 1984, 2015). This study was developed using experiential learning theory to examine student preferences for grasping information and to purposefully sequence information as it was presented to students.

**Purpose and Objectives**

The purpose of this portion of a larger study was to examine learning disability classification status as a variable related to preference for grasping information through experiential learning theory. To accomplish this purpose, the following objectives were used to frame the examination:

1. Describe the pretest and posttest scores for students with and without learning disability classification.
2. Describe the change in pretest and posttest scores for students with and without learning disability classification when information is presented in a sequence matching student learning preference.

**Methods**

This study was conducted as a quasi-experimental cross-over examination of the factors related to student learning on STEM content assessments in agricultural education. The crossover design was chosen based on the ability of this design to provide an examination of the effects of two separate treatments on each participant, in an effort to decrease threats to external validity (Shadish, Cook, & Campbell, 2002). The dependent variables in this study were the change scores from pretest to posttest on two researcher-developed assessments for science-infused units of instruction. Independent variables of interest for this portion of the study included learning disability classification and preference for grasping information through either apprehension (CE) or comprehension (AC).

This study included participation from students enrolled in a freshman level introduction to agriculture course at three Texas high schools (*N* = 105). A total of *n* = 103 students completed the consent and assent process. Two separate week-long units of instruction were created, one in water science and one in soil science. Each of the content area units were created with two cognitive sequences, one with lesson plans presenting each new concept through a concrete experience and moving to abstract conceptualization, and another complementary unit with lesson plans presenting each new concept first through abstract conceptualization and then progressing to a concrete experience activity. Each test unit (site) received both content areas, and sites were randomized as to which content area and cognitive sequence they would receive first. Identical pre and post-test assessments were given to students for each content area, regardless of the cognitive sequence of instruction. A group of experts in agricultural education, experiential learning theory, and curriculum planning assisted in the preparation and development of the treatment curricula. Instructors at each school were trained in the utilization of the curriculum models provided and signed agreements of compliance to verify their instruction of the units exactly as presented in the trainings.

Unit assessments were developed to directly assess each of the unit objectives with exam questions at multiple levels of cognition. Reliability coefficients (*KR-20*) were 0.75 for the water science pretest and 0.78 for the water science posttest. For the soil science tests, the resulting reliability coefficients (*KR20*) were 0.81 for the pretest and 0.86 for the posttest. Reliability coefficients derived from a *KR-20* analysis for teacher-made tests are considered to be acceptable at a level of 0.65 or higher (Frisbie, 1988), thus the reliability of both unit assessments were deemed acceptable for the intended purpose of this study. To determine the learning style preference for respondents in regard to grasping information, *KLSI v. 3.1* instrument was used. Validity of the KLSI v. 3.1 has been widely established for use in the field of education (Kolb & Kolb, 2005). Validity was determined to be acceptable for the purposes of this study. Previous measures of reliability for the four learning modes included in the KLSI range from α = 0.77 to α = 0.84 (Kolb & Kolb, 2005). As such, the reliability was determined to be suitable for use in this study.

To collect the information related to learning disability classification, teachers provided a verification of student LD based on the presence of an IEP requiring instructional modifications. In one site, LD classification was not readily available to teachers. We contacted school district personnel who were able to provide the data directly. Resulting data were analyzed using IBM SPSS © version 23.

**Findings**

The majority of all students (*n =* 75) had a preference for grasping through apprehension. Student preferences for learning based on apprehension or comprehension were similar for those with and without learning disability classification. Preferences for grasping information are shown in Table 1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1  *Student Preferences for Grasping Through Apprehension (CE) or Comprehension (AC)* | | | | | |
| LD Classification | *f* | Apprehension Preference | | Comprehension Preference | |
| *f* | % | *f* | % |
| LD | 30 | 22 | 73.3 | 8 | 26.7 |
| No LD | 73 | 53 | 72.6 | 20 | 27.4 |
| Total | 103 | 75 | 72.8 | 28 | 27.2 |

Students with learning disabilities had lower scores on the pretest for both the water science and soil science units than those students without a learning disability. Pretest scores are shown in Table 2.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 1  *Mean Pretest Scores for Water Science and Soil Science Units by Learning Disability Classification* | | | |
| LD Classification | *n* | Water Science Unit *M*(*SD*) | Soil Science Unit *M*(*SD*) |
| LD | 30 | 17.*70(16.44)* | 16.16(*14.58)* |
| No LD | 73 | 23.*00(18.95)* | 19.61*(14.61)* |
| Total | 103 | 21.46*(18.42)* | 19.04*(16.27)* |

Changes in score from pretest to posttest were examined related to student learning disability classification and student preference for grasping information. Students with learning disabilities showed larger changes in scores when the information was presented in the sequence matching their learning preference. Results for change scores when information was presented in a sequence matching preference are shown in Table 2. Results for change scores when information was presented in a sequence opposite preference are shown in Table 3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 2  *Change Scores for Water Science Unit Based on Sequence of Unit, Match to Learning Preference, and Learning Disability classification* | | | | |
| LD Classification | Sequence of Unit | | | |
| *n* | Matched to Preference *M*(*SD*) | *n* | Opposite of Preference *M*(*SD*) |
| LD | 13 | 63.38*(17.31)* | 17 | 24.94*(19.95)* |
| No LD | 20 | 63.65*(21.19)* | 53 | 36.92*(17.46)* |
| Total | 33 | 63.55*(19.75)* | 80 | 31.44*(18.11)* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3  *Change Scores for Soil Science Unit Based on Sequence of Unit, Match to Learning Preference, and Learning Disability classification* | | | | |
| LD Classification | Sequence of Unit | | | |
| *n* | Matched to Preference *M*(*SD*) | *n* | Opposite of Preference *M*(*SD*) |
| LD | 17 | 55.53*(18.54)* | 13 | 28.00*(18.19)* |
| No LD | 53 | 60.32*(17.68)* | 20 | 34.65*(14.20)* |
| Total | 80 | 59.16*(18.01)* | 33 | 32.03*(16.32)* |

**Conclusions/Implications**

All students showed increases in change scores when the information was delivered in the sequence matching their learning preferences. Changes were more prominent for students with learning disabilities when sequences were opposite their preference for grasping information. Sequencing instruction based on individual student preferences for grasping information has close ties to the literature related to differentiated instruction. Tomlinson (2001) points out the importance of tailoring educational practices to meet the needs of each student. The findings of this study give an example of just how critical differentiated instruction is when dealing with STEM concepts in agricultural education classes.

More students with learning disabilities had a preference for grasping information through apprehension than comprehension. These students likely benefit from enrollment in an agricultural education course that focuses on providing concrete experiences for grasping abstract concepts. By this token, it is promising that agricultural education has increased proportions of students with learning disabilities who are able to experience the experiential learning cycle more completely. Of course, students can only fully realize the benefits found from cognitive sequencing through ELT in agricultural education if agricultural educators have the skills required to teach using a full ELT model. We recommend teacher educators ensure both preservice and in-service teachers are instructed on the proper integration and use of all four components of the ELT cycle through preservice instruction and professional development training.

Because all of the students in this study were enrolled in general education courses, it is likely that the students with learning disabilities in this study required only minor modifications to instruction. It is a limitation to this study that individuals with learning disabilities could not be identified based on their specific accommodation plans. Students with preferences for grasping through both apprehension and comprehension exist in an agricultural education classroom, so which of the cognitive sequences is better suited for development of curriculum materials? Perhaps rather than looking at the sequence as an either or concept, the answer would be to include both sequences within units in order to ensure the needs of all students are met. This small change to educational methods may have broad-reaching effects, not only for students without learning disabilities, but for all students in agricultural education classrooms.

**References**

Bender, W. N. (Ed.). (2007). *Differentiating instruction for students with learning disabilities: Best teaching practices for general and special educators*. Thousand Oaks, CA: Corwin Press.

Bender, W. N. (2008). *Learning disabilities: Characteristics, identification, and teaching strategies*. Boston, MA: Allyn & Bacon.

Boaler, J. (1998). Open and closed mathematics: Student experiences and understandings. *Journal for Research in Mathematics Education, 29*(1), 41-62. doi: 10.2307/749717

Frisbie, D. A. (1988). Reliability of scores from teacher‐made tests. *Educational Measurement: Issues and Practice*, *7*(1), 25-35.

Furner, J. M., & Kumar, D. D. (2007). The mathematics and science integration argument: A stand for teacher education. *Eurasia Journal of Mathematics, Science & Technology Education*, *3*(3).

Hampton, N. Z., & Mason, E. (2003). Learning disabilities, gender, sources of efficacy, self-efficacy beliefs, and academic achievement in high school students. *Journal of School Psychology*, *41*(2), 101-112

Kieran, C. (1992), The learning and teaching of school algebra. In D. A. Grouws (Ed.), *The handbook of research on mathematics teaching and learning* (pp. 390-419). New York, NY: Macmillan.

Kolb D. (1984). *Experiential learning as the science of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (2nd Ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Kolb, A. Y., & Kolb, D. A. (2005). *The Kolb Learning Style Inventory version 3.1 2005 technical specifications.* Philadelphia, PA: HayGroup. Retrieved from http://learningfromexperience.com/media/2010/08/tech\_spec\_lsi.pdf

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin Company.

Sousa, D. A. (2011). *How the brain learns*. Thousand Oaks, CA: Corwin Press.

Stone III, J. R. (2011, May). *Delivering STEM education through career and technical education schools and programs.* Paper presented at the National Research Council Workshop on Successful STEM Education in K-12 Schools. Retrieved from http://www7.nationalacademies.org/bose/STEM\_Schools\_Workshop\_Paper\_Stone.pdf.

Wagner, M. M., Newman, L. A., & Javitz, H. S. (2015). The benefits of high school Career and Technical Education (CTE) for youth with learning disabilities. *Journal of Learning Disabilities*, 1-13. doi: 10.1177/0022219415574774

Woodward, J. & Montague, M. (2002). Meeting the challenge of mathematics reform for students with LD. *Journal of Special Education, 36*(2), 89-101.

**The Shared Experiences of Prospective School-Based Agricultural Education Teachers: A Phenomenology of Supervised Agricultural Experiences**

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Dr. Jon W. Ramsey, Oklahoma State University

Dr. Marshall A. Baker, Oklahoma State University

Dr. Mary Jo Self, Oklahoma State University

**Abstract**

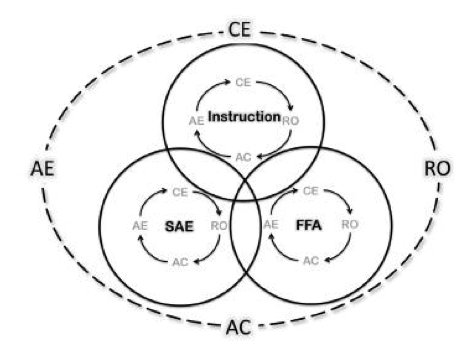
*The purpose of this qualitative, phenomenological study was to better understand supervised agricultural experience (SAE) programs through the lived experiences of self-identified future school-based agricultural education (SBAE) teachers in Oklahoma. Phenomenological methods were used to explore eight Future Agricultural Education Teacher Academy participants representing the five agricultural education districts in the state. The research questions investigated the learning outcomes and experiences regarding SAE programs. Subjects in this study reported learning skills and external factors through their SAEs. Four themes were revealed from the reported data to include: (a) subjects attain skills through SAE programs; (b) teachers have a great influence on subjects SAE programs; (c) subjects have limited and narrow perceptions of SAEs; and (d) subjects believe SAE programs diversify their experiences in agriculture. The essence was revealed that teachers determine learning through SAE programs, which provided the greatest opportunity for the acquisition of employability skills in the SBAE program. Recommendations were developed to address the findings and conclusions for each theme.*

**Introduction/Theoretical Framework**

Research focused on identifying “best practices” for school based agricultural education (SBAE) has concluded supervised agricultural experience(SAE) programs are a fundamental component of the agricultural education model and should be implemented in agricultural education programs (Croom, 2008, Dyer & Osborne, 1995; Retallick, 2010). Supervised agricultural experience programs provide an opportunity to apply technical skills and information learned in a school-based agricultural education classroom (Ewing, 2010) to occupational, non-occupational, and exploratory experiences outside of the classroom (Cheek & Arrington, 1990). It is “believed to be a foundational piece of a [SBAE] student’s experience” (Lewis, Rayfield, & Moore, 2012, p. 78). SAE programs function as an authentic experiential and independent learning opportunity for students (Barrick, Arrington, Heffernan, Hughes, Moody, Ogline, & Whaley, 1992; Ewing, 2010; Hughes & Barrick, 1993; Phipps, Osborne, Ball, & Dyer, 2008; Ramsey & Edwards, 2004; Retallick, 2003; Retallick, 2011) as they plan and implement a SAE program hinged upon their interests in the agricultural industry.

A primary focus of SBAE programs is to provide opportunities to prepare students for entry-level careers in the agricultural industry (Phipps et al., 2008). SAE programs have been noted to provide skills desirable for the agricultural industry (Ramsey, 2009) and have been the focus of numerous studies (Dyer & Williams, 1997; Lewis et al., 2012; Ramsey & Edwards, 2012; Stewart & Birkenholz, 1991). School based agricultural education has transformed considerably throughout the past three decades to meet the needs of students (Phipps, et al., 2008; Talbert et al., 2007). Students participate in individual SAEs to develop knowledge and skills from a SAE program (Croom, 2008; Jenkins III & Kitchel, 2009; Phipps et al., 2008; Ramsey & Edwards, 2012; Roberts & Ball, 2009; Talbert et al., 2007). However, information about specific competencies or skills learned as a result of the SAE experiences is lacking in the literature. Moreover, factors that influence learning as a result of the SAE program have not been studied. Therefore, two issues exist: What are the specific learning outcomes as a result of a SAE program and what factors contribute to student learning as a result of a SAE program?

Experiential learning has long been the backbone of agricultural education since the commencement of the Smith-Hughes Act in 1917 (Graham & Birkenholz, 1999). As such, it served as the framework for this study. Kolb (1984) stressed all learning is experiential. Additionally, Roberts (2006) reported experiences occur in unique contextual settings to foster more understanding and vocabulary regarding experiential learning. Further, Roberts (2006) asserted each experience should be defined through four dimensions: level, duration, intended outcome, and setting. Each component of the agricultural education model promotes experiences in different contexts (Roberts, 2006). As such, experiential learning is a central element in all facets of the comprehensive agricultural education program. Baker, Robinson, and Kolb (2012) developed the Comprehensive Model for Secondary Agricultural Education to operationalize experiential learning within agricultural education. The central theme of the model features the experiential learning cycle embedded in all three facets of agricultural education, making the total program experiential in nature, thus not emphasizing one component over another with respect to being referred to as the one experiential component (Figure 1).



*Figure 1.* Enriched Agricultural Education Model. Reprinted from “Aligning Kolb’s Experiential Learning Theory with a Comprehensive Agricultural Education Model”. M. A. Baker, J. S. Robinson, & D. A. Kolb, 2012, *Journal of Agricultural Education, 53*(4), p. 1 – 16. Reprinted with permission.

**Purpose/Objectives**

The purpose of this study was to describe shared experiences of future SBAE teachers regarding SAE programs. The researcher sought to gain a deeper understanding of future SBAE teachers’ SAE programs, learning outcomes attributed to their SAE programs, and factors that contributed to those learning outcomes. Three questions guided this study:

1. What are the learning outcomes attributed to their respective SAE experiences?
2. What are the external factors that the subjects attribute to learning outcomes as a result of their SAE program?
3. What are the subjects’ experiences regarding their SAE programs?

**Methods/Procedures**

Moustakas (1994) described the transcendental phenomenology step-by-step process as a reduction process, reducing data to one central essence. Polkinghorne (1989) recommended researchers interview 5 to 25 subjects who have experienced the phenomenon, while Creswell (2012) recommended interviewing subjects until data saturation was reached. Ten self-identified future agricultural education teachers attending the Oklahoma State University (OSU), Agricultural Education Future Teacher Academy were utilized for this study. These students were self-identified as future school-based agricultural education teachers and were selected to participate in the Academy at OSU. The ten criteria of trustworthiness were embedded in the entire process (Tracy, 2010).

Because the researchers employed the phenomenological approach, “the process of collecting information involves primarily in-depth interviews”, coupled with document analysis was employed for this study (Creswell, 2007, p. 131). Semi-structured interviews, lasting approximately 30 minutes were recorded on a digital recording application on an iPhone. Data were then transcribed verbatim using *Microsoft Word* and proceeded until data saturation was reached.

Analysis of the data was guided using the Stevick-Colaizzi-Keen method modified by Moustakas (1994). Transcriptions were downloaded and coded for the purpose of horizonalization using the computer software *Nvivo*. Horizonalization can be described as “the process of laying out all the data for examination and treating the data as having equal weight; that is, all pieces of data have equal value at the initial data analysis stage” (Merriam, 2009, p. 26). This would employ for the researchers to look at each statement, or horizon, of the transcription equally and then identify significant statements. Bounded horizons were then clustered under codes.

Once the horizons were coded, “…nonrepetitive, nonoverlapping constituents were clustered into themes” (Moustakas, 1994, p.180). As a result, the data from eight subjects yielded 364 significant statements under 21 codes and four themes emerged. Themes were then used to develop textural descriptions, describing *what* was experienced and structural descriptions describing *how* it was experienced. The textural and structural descriptions were then synthesized into the essence of the experience (Moustakas, 1994). The essence, which focuses on the common experiences of the subjects (Creswell, 2012), for this study focused on the experiences of the self-identified future agricultural education teachers regarding their respective SAE programs.

**Results/Findings**

Four themes emerged from the data, which included 364 significant statements and 21 codes. The themes of student learning as a result of their respective SAE programs and the influencers that attributed to their learning emerged from analyzing the data. The themes were:

* Subjects attain skills through their SAE programs
* Teachers have a great influence on subjects’ SAE programs
* Subjects have limited and narrow perceptions of SAE
* Subjects believe SAE programs diversify their experiences in agriculture

Objective 1; Theme 1: *Subjects Attain Skills Through their SAE Programs*. Subjects overwhelmingly reported learning employability skills as a result of their SAE program. Participants revealed a wide array of skills and competencies.

Objective 2; Theme 2: *What are the Learning Outcomes Attributed to their Respective SAE Experiences?* Individuals who supported student SAE programs initiated learning opportunities and cultivated meaningful relationships with the subjects. Students reported their agricultural education teachers as the main influencers for learning through their respective SAE programs. Additionally, students revealed a chain reaction began due to the relationship with their agricultural education teacher, having the student become self-motivated within their respective total agricultural education program. This indicated an increase in the students’ efficacy to provide teaching opportunities to other students. Most subjects have embarked on student teaching opportunities and have reported having a holistic understanding of agricultural education.

Objective 2; Theme 3: *Subjects Have Limited and Narrow Perceptions of SAE.* Several subjects deduced SAE into its simplest terms. However, several subjects were unclear with the definition of an SAE program. When the subjects were asked to describe their SAE program, some described it using correct terminology. For example, Charlotte described her SAE as equine production placement and Charlie described his as swine production. Sandra described both her feed business and her swine production operations. However, there are a few subjects that had a different way to operationalize their SAE programs.

Objective 3; Theme 4: *Subjects Believe SAE Programs Diversify their Experiences in Agriculture.* Most subjects reported an appreciation for learning new content and trying different curriculum and activities. In fact, subjects reported an affinity towards diversifying their respective agricultural education programs with both content and individuals. Overall, the subjects revealed that they appreciated new content and individuals infiltrating their respective SBAE programs.

Subjects reported increased knowledge from their SAE programs. They revealed employability skills were gained as a result of their respective SAE programs. Teachers of the subjects interviewed were noted as the main influencers of learning through the students’ SAE programs. However, most subjects reported only surface level understanding regarding SAE program knowledge. When new content was presented in the total SBAE program, the subjects expressed an overall appreciation to incorporate diversity. Finally, when asked to describe SAE programs, most subjects revealed a skewed and inverted perception of their own SAE program and its overall meaning.

**Conclusions/Recommendations/Implications**

Objective 1: *What are the Learning Outcomes Attributed to their Respective SAE program?*

Agricultural education students who participate in SAE programs attained employability and life skills. Subjects of this study shared a wide array of skills and competencies they credited with their SAE experiences. Skills identified include herd health management, illness identification, interpreting swine ear notches, developing feed rations, operating heavy machinery, implementing financial record systems, and business management. The identified skills could be useful when seeking entry-level jobs. Experiential learning principles were evident in this theme as students discussed their SAE programs. However, to what degree did teachers facilitate experiential learning purposely? What specific components of the experiential learning cycle assist with skill acquisition? To address these questions, further research is needed to assess teachers’ implementation of the experiential learning cycle regarding SAE programs.

Objective 2: *What are the External Factors That Contributed to the Specified Learning Outcomes as a Result of the SAE Program?* The SBAE teacher had the greatest influence on students’ SAE. Some research has reported teachers are a barrier to SAE implementation (Clarke & Scanlon, 1996; Dyer & Osborne, 1995). The subjects in this study, however, noted the opposite effect. As teachers are charged with providing meaningful experiences to students (Roberts, 2011), several subjects reported their agricultural education teacher helped them develop an SAE that was interesting and meaningful to them. These meaningful experiences led by the agricultural education teacher promoted participation and achievement. However, several students reported a surface level or unclear understanding of a SAE program. Students could not separate the individual components of the three-component model of agricultural education when describing the classification of their SAE program. Could it be that in-service teachers in Oklahoma are teaching the agricultural education model comprehensively, where the students do not process three separate components, but instead three parts to a holistic model? Could it be that these self-identified future SBAE teachers have been looking through the wrong lens to determine SAE quality? It is recommended that future research be conducted to identify how secondary students internalize SAE quality and their implications.

Objective 3: *What are the Subjects’ Experiences Regarding their SAE Programs?* Students appreciate learning a wide range of content and experiencing a variety of activities associated with agriculture. Additionally, the subjects revealed that new content provided recruitment opportunities for the agricultural education program. It is recommended that in-service teachers employ diverse activities, curriculum, and CDEs within their respective programs to continue with recruitment efforts. Additionally, the subjects reported feeling a sense of obligation to aid in recruitment. Could experiencing a comprehensive, diverse SBAE help students “see” themselves as SBAE teachers? To investigate, it is recommended that in-service teachers identify students with strong SAE programs and a desire to teach agricultural education and engage them as apprentice teachers.

Ultimately, the central essence of this research revealed subjects gained a wide array of skills and competencies as a result of their SAE programs and SBAE teachers were the main determinant of learning in SAE programs.

**References**

Baker, M. A., Robinson, J. S., Kolb, D. A. (2012). Aligning Kolb’s Experiential Learning Theory with a comprehensive agricultural education model. *Journal of Agricultural Education, 53*(4), 1 – 16. doi: 10.5032/jae.2012.04001

Barrick, R. K., Arrington, L. R., Heffernan, T., Hughes, M., Moody, L., Ogline, P., & Whaley, D. (1992). *SAE experience agriculture: A handbook on supervised agricultural experience.* Alexandria, VA: National Council for Agricultural Education.

Cheek, J. G., & Arrington, L. R. (1990). Reshaping SAE to provide experiential learning in the 1990’s. *The Agricultural Education Magazine, May 1990, 62,* 5 – 7.

Clarke, R. W., & Scanlon, D. C. (1996). The effects of teacher attitudes and related factors on FFA proficiency awards won above the federation level. *Journal of Agricultural Education, 37*(2), 8 – 16. doi: 10.5032/jae.1996.02008

Creswell, J. W. (2007). Qualitative inquiry and research method: Choosing among five approaches. Sage, Thousand Oaks.

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

Croom, D. B. (2008). The development of the integrated three-component model of agricultural education. *Journal of Agricultural Education, 49*(1), 110 – 120. doi: 10.5032/jae.2008.01110

Dyer, J. E., & Osborne, E. W. (1995). Participation in supervised agricultural experience programs: A synthesis of research. *Journal of Agricultural Education, 36*(1), 6 – 14. doi: 10.5032/jae.1995.01006

Dyer, J. E., & Williams, D. L. (1997). Benefits of supervised agricultural experience programs: A synthesis of research. *Journal of Agricultural Education, 38*(4), 50 – 58. doi: 10.5032/jae.1997.04050

Ewing, J. C. (2010). Supervised agricultural experience programs in the 21st century: Where are we today? *The Agricultural Education Magazine, July/August 2010*, 4.

Graham, J., & Birkenholz, R. (1999). Changes in Missouri SAE programs. *Proceedings of the Annual National Agricultural Education Research Conference, Orlando, FL,* 172 – 178.

Hughes, M., & Barrick, R. K. (1993). A model for agricultural education in public schools. *Journal of Agricultural Education, 34*(3), 59 – 67. doi: 10.5032/jae.1993.03059

Jenkins III, C. C., & Kitchel, T. (2009). Identifying quality indicators of SAE and FFA: A Delphi approach. *Journal of Agricultural Education, 50*(3), 33 – 42. doi:10.5032/jae.2009.03033

Kolb, D. A. (1984). *Experiential Learning: Experiences as a source of learning and development.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Lewis, L. J., Rayfield, J., & Moore, L. L. (2012) Supervised agricultural experience: An examination of student knowledge and participation. *Journal of Agricultural Education, 53*(4), 70 – 84. doi: 10.5032/jae.2012.04070

Merriam, S. B. Miller, T. R. (1980). The changing status of supervised occupational experience in vocational agriculture in North Carolina. *Journal of the American Association of Teacher Educators in Agriculture, 21*(1), 13 – 18. doi: 10.5032/jaatea.1980.01013

Moustakas, C. (1994). *Phenomenological research methods.* Thousand Oaks, CA: Sage.

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools* (6th ed.). Clifton Park, NY: Thomson Delmar Learning.

Polkinghorne, D. E. (1989). Phenomenological research methods. In R. S. Valle & S. Halling (Eds.), *Existential-phenomenological perspectives in psychology* (p. 41–60). New York, NY: Plenum Press.

Ramsey, J. W. (2009). *Identifying entry-level skills expected by agricultural industry experts and determining teachers' perceptions on whether they are being learned through students' participation in the supervised agricultural experience component of the secondary agricultural education program: A two-panel delphi.* (Unpublished doctoral dissertation). Oklahoma State University, Stillwater, OK.

Ramsey, J. W., & Edwards, M. C. (2004). Informal learning in science: Does agricultural education have a role? *Journal of Southern Agricultural Research, 54*(1), 86 – 99.

Ramsey, J. W., & Edwards, M. C. (2012). Entry-Level Technical Skills That Teachers Expected Students to Learn through Supervised Agricultural Experiences (SAEs): A Modified Delphi Study. *Journal of Agricultural Education*, *53*(3), 42 – 55. doi: 10.5032/jae.2012.03042

Retallick, M. S. (2003). Reframing SAE: The tricycle principle. The Agricultural Education Magazine, 75(6), 8 – 9.

Retallick, M. S. (2010). Implementation of supervised agricultural experience programs: The agriculture teachers’ perspective. *Journal of Agricultural Education, 46*(1), 44 – 54. doi: 10.5032/jae.2010.040.59

Retallick, M. S. (2011). Learning by doing through SAE: It isn’t as easy as it sounds! *The Agricultural Education Magazine, January/February 2011,* 23 – 25.

Roberts, T. G. (2006). A philosophical examination of experiential learning theory for agricultural educators. *Journal of Agricultural Education, 47*(1), 17 – 29. doi: 10.5032/jae.2006.01017

Roberts, T. G. (2011). What is Experiential Learning?. *The Agricultural Education Magazine*, *83*(4), 4 – 6.

Roberts, T. G., & Ball, A. L. (2009). Secondary agricultural science as content and context for teaching. *Journal of Agricultural Education, 50*(1), 81 – 91. doi: 10.5032/jae.2009.01081

Talbert, B. A., Vaughn, R., Croom, D. B., & Lee, J. (2007). *Foundations of agricultural education* (2nd ed.). Danville, IL: Professional Educators Publications, Inc.

Tracy, S. J. (2010). Qualitative quality: Eight “big-tent” criteria for excellent qualitative research. *Qualitative Inquiry*, *16*(10), 837–851. doi: 10.1177/1077800410383121

**Career Decisions of Agricultural Education Teaching Graduates**

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**Abstract**

*The teacher shortage in secondary agricultural education is well-documented and perhaps among the most serious of issues the profession faces. The purpose of this study was to explore potential influences that shape agricultural education teaching graduates’ decisions to enter or stay in the profession. After analyzing responses from 46 Montana agricultural education teaching graduates from 2005-2016 (79.3% response rate), common themes emerged from individuals who never entered the profession and those who are currently teaching. Jobs outside of education, competitive salaries and administrative leadership were among the top reasons for never entering. Conversely, a competitive salary in their community, connections to students and the community, and role as an FFA advisor stood out as reasons for remaining. Primary stakeholder recommendations include more pre-service educator time in the classroom, continued professional development opportunities, and addressing salary issues.*

**Introduction/Theoretical Framework**

The need for agricultural education teachers is a well-documented issue across the United States (Foster, Lawver, & Smith, 2017; Kantrovich, 2010; Myers, Dyer, & Washburn, 2005). Public school districts continue to struggle to fill positions, and university agricultural education teacher preparation programs deal with a perceived lack of interest in the teaching profession. Agricultural education stakeholders need current, accurate estimates of the supply and demand for agricultural education teachers to provide meaningful policy decisions at all levels (Kantrovich, 2010). Teacher educators, agricultural education organizations, and state agricultural education staff need such data as well for use in recruitment efforts (Foster et al., 2017).

Nationwide, there are 7,775 agricultural education programs employing 11,558 teachers (Foster et al., 2017). Yet, 66 full time vacancies existed and 245 alternatively certified teachers were hired to fill positions in 2016 (Foster et al., 2017). With such a shortage evidenced, current research has sought to explain the phenomenon. Specifically, hurdles to either entering the profession or remaining in it include competitive salaries outside education, being recruited for another position (Lemons, Brashear, Burris, Meyers & Price, 2015), and an inadequate work-life balance (Lemons et al., 2015; Tippens, Ricketts, Morgan, Navarro, & Flanders, 2013; Sorensen, Lambert & McKim, 2014). With half of all school based agricultural education (SBAE) teachers leaving the profession within their first six years (Clark, Kelsey, & Brown, 2014), the need is greater than ever for agricultural education majors to enter the profession and build a career within it.

The framework for this study was a combination of multiple theories and models and began with Bandura’s Social Learning Theory (SLT) (1977), which provided a theoretical foundation for explaining the factors associated with a program completer’s decision to not enter, stay in or leave the teaching profession. Bandura’s SLT (1977) posits that learning and decision-making is largely a cognitive process that often takes place in a social setting or context, and primarily occurs through an individual’s observation or by direct instruction. Building upon Bandura’s SLT (1977), Krumboltz (1979) and Mitchell and Krumboltz (1996) related SLT to individual career decisions. Specifically, Mitchell and Krumboltz (1996) adapted the SLT model to identify four individual components that interact and play off each other when individuals make certain career decisions. Further, Chapman (1983) applied the Social Learning Theory of Career Decision-Making to the teaching profession and sought to explain the retention and attrition of beginning teachers.

More recently, Rots, Aelterman, Devos, and Vlerick (2010) built upon Chapman’s (1983) model and the Social Learning Theory of Career Decision Making (Mitchell & Krumboltz, 1996) by framing it around teacher education graduates and their decisions to take a teaching position upon graduation. As a continuation of previous models, Rots et al. (2010) sought to combine these bodies of work into a single model that could be used to test the relationship between teacher education variables and an individual’s intent to enter the teaching profession. Rots et al. (2010) contends that teacher entrance into the field is a combination of many factors, including educational preperation, the individual’s intial commitment to teaching, integration into the teaching profession, and external influencers.

Montana perennially faces a shortage of graduates entering and remaining in the teaching profession as career educators. The purpose of this study was to explore potential influences that shape agricultural education teaching graduates’ career decisions. Specific objectives included:

1. Identify potential reasons behind an agriculture education teaching graduate’s decision to not enter the teaching profession.
2. Identify potential reasons behind an agriculture education teaching graduate’s decision to stay in the teaching profession.

**Methods/Procedures**

As part of a larger project, the target population for this study was Montana State University (MSU) Agricultural Education-Broadfield Teaching graduates who completed their degree programs between May 2005 and May 2016 (N=58). This study utilized a researcher-designed, online survey that was reviewed by a panel of experts whose research interests involved agriculture teacher preparation and retention. After multiple rounds of expert revisions, the survey was submitted to the MSU Human Ecology Learning and Problem Solving (HELPS) Lab to check for content validity and reliability. The instrument included multiple choice/open-ended questions, Likert-type items, and a general demographics section. The Likert-type items asked respondents to identify degrees of influence regarding their respective career decisions (major, moderate, minor or non- factor). These Likert-type items were then divided into three separate constructs to allow for comparison of similar items: (1) *Career Factors*, (2) *Teacher Training/Professional Development* and (3) *Perceptions of the School Environment*.

The Tailored Design Method (Dillman, Smyth, & Christian, 2008) was utilized as a guide for data collection. Six different contact efforts resulted in a 79.3% (*n*=46) response rate. Ary, Jacobs, and Razavieh (1996) suggested that if a response rate of at least 75.0% has not been achieved, the researcher should attempt to determine and describe how the respondents and non-respondents might differ. Non-response error was not addressed in this study because data collection efforts resulted in a sufficient response rate and results were explicitly stated as not to be generalized beyond sample parameters. After seven weeks, responses were analyzed to determine frequencies, means, standard deviations and Cronbach’s Alphas. Creswell’s Data Analysis Spiral (2013) was used to identify general themes and categories for qualitative reporting.

**Results**

At the beginning of the survey, participants were asked to describe their career paths upon graduation. Responses were narrowed into two broad groups: *never entered* and *currently teaching*. The *never entered* group included only those respondents who had never entered the agricultural education teaching profession (*n*=16, 34.8%). The *currently teaching* group (*n*=22, 47.9%) was a combination of respondents who indicated either: (a) entering the high school agricultural education teaching profession upon graduation, and are currently teaching (*n*=21, 45.7%), or (b) not entering the high school agricultural education teaching profession upon graduation, entering at a later date, and are currently teaching (*n*=1, 2.2%).

Objective one sought to identify potential reasons behind a graduate’s decision to not enter the profession. Upon graduation from MSU, only five members of the *never entered* group (*n*=16) reported applying for agricultural education teaching positions. Within the *Career Factors* construct, respondents in the *never entered* group indicated that competitive salary outside the field of education (*M*=2.06) was the most influential factor in deciding to not enter the teaching profession. Additionally, being recruited for another position (*M*=1.94) and inadequate work-life balance (*M*=1.06) were reported as being influential in deciding to not enter the teaching profession. Respondents indicated both the *Teacher Training/Professional Development* and *Perceptions of the School Environment* construct items were not greatly influential in deciding to not enter the teaching profession. Response items, sorted by mean scores, can be seen in Table 1.

Respondents also had the opportunity to provide short answer responses to elaborate on career decisions. First, respondents were asked to indicate if they believed MSU provided the necessary training, skills and knowledge to become a successful high school agricultural educator. Six of the 16 reported inadequate training, skills and knowledge. Recurring themes among respondents were more time in an actual classroom, additional training in classroom and situational management, working with administrators and additional coursework in laboratory topics. Next, respondents were asked to describe their intent to enter the teaching profession upon graduation from high school. Five indicated no intent to enter the teaching profession. Response frequency grew to eight when asked about intent to teach upon graduation from MSU. Further, 11 respondents indicated not even applying for high school agricultural education teaching jobs upon graduation.

The purpose of objective two was to identify potential reasons behind an agriculture education teaching graduate’s decision to stay in the profession. Within the *Career Factors* construct, a stable contract (*M*=2.50) was reported as the strongest influencer in deciding to remain in the teaching profession. Work-life balance (*M*=2.14), time to raise a family (*M*=1.91) and a competitive salary in their community (*M*=1.82) were also reported as substantial influencers in deciding to remain in the profession. The *Teacher Training/Professional Development* constructrevealed adequate training to support the position (*M*=1.91) was the item of most influence, with adequate training to manage classroom (*M*=1.82) and advancement in the teaching profession (*M*=1.65) not far behind.

Table 1. *Never Entered Teaching Group Reasons by Construct*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | N/A | |  | Minor | |  | Moderate | |  | Major | |  |  |
|  | *f* | % |  | *f* | % |  | *f* | % |  | *f* | % | Meana | SD |
| Career Factor Construct |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Competitive salary elsewhere OUTSIDE the field of education | 2 | 12.5 |  | 2 | 12.5 |  | 5 | 31.3 |  | 7 | 43.8 | 2.06 | 1.06 |
| Recruited for another position | 3 | 18.8 |  | 2 | 12.5 |  | 4 | 25.0 |  | 7 | 43.8 | 1.94 | 1.18 |
| Inadequate work-life balance | 6 | 37.5 |  | 6 | 37.5 |  | 1 | 6.3 |  | 3 | 18.8 | 1.06 | 1.12 |
| Relocation | 7 | 43.8 |  | 7 | 43.8 |  | - | - |  | 2 | 12.5 | 0.81 | 0.98 |
| Career change | 8 | 50.0 |  | 5 | 31.3 |  | 1 | 6.3 |  | 2 | 12.5 | 0.81 | 1.05 |
| Competitive salary elsewhere WITHIN the field of education | 7 | 43.8 |  | 6 | 37.5 |  | 3 | 18.8 |  | - | - | 0.75 | 0.77 |
| Raising a family | 10 | 62.5 |  | 2 | 12.5 |  | 2 | 12.5 |  | 2 | 12.5 | 0.75 | 1.13 |
| Dissatisfied with reassignment or changes in the position | 10 | 62.5 |  | 5 | 31.3 |  | 1 | 6.3 |  | - | - | 0.44 | 0.63 |
| Reduction in force | 11 | 68.8 |  | 4 | 25.0 |  | 1 | 6.3 |  | - | - | 0.38 | 0.62 |
| Career break | 11 | 68.8 |  | 5 | 31.3 |  | - | - |  | - | - | 0.31 | 0.48 |
| End of contract/temporary assignment | 3 | 81.3 |  | 2 | 12.5 |  | 1 | 6.3 |  | - | - | 0.25 | 0.58 |
| Teacher Training/Professional Development Construct |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequate training to manage classroom | 8 | 50.0 |  | 3 | 18.8 |  | 2 | 12.5 |  | 3 | 18.8 | 1.00 | 1.21 |
| Inadequate training to support position | 8 | 50.0 |  | 4 | 25.0 |  | 2 | 12.5 |  | 2 | 12.5 | 0.88 | 1.09 |
| Lack of advancement in the teaching profession | 9 | 56.3 |  | 6 | 37.5 |  | 1 | 6.3 |  | - | - | 0.50 | 0.63 |
| Perceptions of School Environment Construct |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequate mentoring | 8 | 50.0 |  | 4 | 25.0 |  | 1 | 6.3 |  | 3 | 18.8 | 0.94 | 1.18 |
| Inadequate administrative leadership | 8 | 50.0 |  | 3 | 18.8 |  | 4 | 25.0 |  | 1 | 6.3 | 0.88 | 1.02 |
| Administrators actions did not support teaching staff | 8 | 50.0 |  | 4 | 25.0 |  | 2 | 12.5 |  | 2 | 12.5 | 0.88 | 1.09 |
| Lack of supportive working environment | 8 | 50.0 |  | 4 | 25.0 |  | 4 | 25.0 |  | - | - | 0.75 | 0.86 |
| Lack of autonomy | 10 | 62.5 |  | 2 | 12.5 |  | 3 | 18.8 |  | 1 | 6.3 | 0.69 | 1.01 |
| Lack of connection to students | 9 | 56.3 |  | 6 | 37.5 |  | - | - |  | 1 | 6.3 | 0.56 | 0.81 |
| Negative culture of school | 11 | 68.8 |  | 2 | 12.5 |  | 2 | 12.5 |  | 1 | 6.3 | 0.56 | 0.96 |
| Unclear opportunities for advancement | 11 | 68.8 |  | 2 | 12.5 |  | 3 | 18.8 |  | - | - | 0.50 | 0.82 |
| Role as FFA advisor | 9 | 56.3 |  | 7 | 43.8 |  | - | - |  | - | - | 0.44 | 0.51 |
| Inadequate community support | 11 | 68.8 |  | 4 | 25.0 |  | 1 | 6.3 |  | - | - | 0.38 | 0.62 |
| Opportunities for competition | 10 | 62.5 |  | 6 | 37.5 |  | - | - |  | - | - | 0.38 | 0.50 |

aFor calculation of mean, N/A=0, Minor=1, Moderate=2, and Major=3.

When asked about intentions to teach agricultural education upon graduation from high school, nine of the 22 respondents in the *currently teaching* group indicated no intent to teach. Further, 17 respondents indicated the student teaching experience highly influenced their decisions to enter the teaching profession. Of the nine respondents indicating no intention to teach upon graduation from high school, eight indicated that by the time they graduated, their intentions had changed and they planned to enter SBAE. Of the 22 respondents in this group, only four reported not receiving the necessary training, skills and knowledge to be successful in the profession.

**Conclusions/ Recommendations/Implications**

Objective one sought to identify potential reasons behind an agriculture education teaching graduate’s decision to not enter the profession. Similar to previous research, competitive salaries outside education, being recruited for another position (Lemons et al., 2015), and an inadequate work-life balance (Lemons et al., 2015; Tippens et al., 2013; Sorensen et al., 2014) emerged as the largest factors in respondents’ decisions to not enter the teaching profession. Respondents also indicated a desire for more time in an actual classroom with students and training in classroom and laboratory management. These findings align with current research (Fritz & Miller, 2003; Garton & Chung, 1996; Knobloch & Whittington, 2002; Mundt & Connors, 1999; Myers, Dyer, & Washburn, 2005; Paulsen, Anderson, & Tweeten, 2015; Touchstone, 2015). Based on these findings, it is recommended that teacher educators, professional teaching organizations and mentor teachers work together to (1) provide more opportunities for pre-service teachers to be in the classroom, (2) provide workshops, seminars and mentoring on how to deal with work-life balance, and (3) investigate solutions on the local and state level to address salaries to combat graduates looking elsewhere for work.

The purpose of objective two was to identify potential reasons behind an agriculture education teaching graduate’s decision to stay in the profession. Aligning with current research, adequate work-life balance (Lemons et al., 2015; Sorensen et al., 2014; Tippens et al., 2013), stable contracts with a competitive salary, positive student, school and community connections (Lemons et al., 2015; Sorensen et al., 2014; Tippens et al., 2013), and the role as an FFA advisor (Garton & Chung, 1996; Myers et al., 2005; Touchstone, 2015) all stood out as top reasons to remain in the teaching profession. Additionally, most respondents indicated they felt adequately prepared to enter the teaching profession, but that additional training and experience in the classroom before student teaching and supplementary mechanical and technical systems coursework would be beneficial to the new graduate. It is recommended that teacher educators explore additional coursework or opportunities for agricultural systems technology to better prepare graduates for a teaching career. Additional time in an authentic classroom environment should also be explored for pre-service teachers. Finally, quality continuing education opportunities need to be provided on a consistent basis, facilitated by professional organizations around the state and region, to ensure early career teachers have the skills and knowledge to continue teaching past the induction stage of their career. Ultimately, stakeholders at all levels of Montana agricultural education should continue to examine the reasons presented in this study to effectively recruit, train and retain agricultural education students to help meet the market demands for agriculture education positions.

**References**

Ary, D., Jacobs, L. C., & Razavieh, A. (1996). *Introduction to Research in Education* (5th ed.). Orlando, FL: Harcourt Brace College Publishers.

Bandura, A. (1977). *Social learning theory.* Englewood Cliffs, NJ: Prentice Hall.

Chapman, D. W. (1983). A Model of the Influences on Teacher Retention. *Journal of Teacher Education, 34*, 43-49.

Clark, M. S., Kelsey, K. D., & Brown, N. R. (2014). The thornless rose: A phenomenological look at decisions career teachers make to remain in the profession. *Journal of Agricultural Education*, 43-56. doi:10.5032/jae.2014.03043

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches.* Thousand Oaks, CA: Sage.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2008). *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (3 ed.). Wiley.

Foster, D. D., Lawver, R. G., & Smith, A. R. (2017). *National agricultural education supply and demand study, 2016 executive summary.* American Association for Agricultural Education.

Fritz, C. A., & Miller, G. (2003). Supervisory options for instructional leaders in education. *Journal of Leadership Education, 2*(2).

Garton, B. L., & Chung, N. (1996). THE INSERVICE NEEDS OF BEGINNING TEACHERS OF AGRICULTURE. *Journal of Agricultural Education, 37*(3), 52-58.

Kantrovich, A. J. (2010). *The 36th Volume of a national study of the supply and demand for teachers of agricultural education.* West Olive, MI: Michigan State University: American Association for Agricultural Education.

Knobloch, N. A., & Whittington, M. S. (2002). Factors that influenced beginning teachers' confidence about teaching in agricultural education. *Proceedings of the 56th Annual Central Region Agricultural Education Research Conference*, (pp. 1-12). Manhattan, Kansas.

Krumboltz, J. D. (1979). *A social learning theory of career decision making.* Evanston, RI: Carroll Press.

Lemons, L. L., Brashears, M. T., Burris, S., Meyers, C., & Price, M. A. (2015). Factors Contributing to Attrition as Reported by Leavers of. *Journal of Agricultural Education, 56*(4), 17-30. doi:10.5032/jae.2015.04017

Mitchell, L. K., & Krumboltz, J. D. (1996). Krumboltz’s Theory of Career Choice and Counseling. In D. Brown, & L. Brooks, *Career Choice and Development* (pp. 233-280). San Francisco.

Mundt, J. P., & Connors, J. J. (1999). Problems and challenges associated with the first years of teaching agriculture: A framework for preservice and inservice education. *Journal of Agricultural Education, 40*(1), 38-48.

Myers, B. E., Dyer, J. E., & Washburn, S. G. (2005). Problems facing beginning agriculture teachers. *Journal of Agricultural Education, 46*(3), 47-55. doi:10.5032/jae.2005.03047

Paulsen, T. H., Anderson, R. G., & Tweeten, J. F. (2015). Concerns expressed by agricultural educaiton preservice teachers in a twitter based electronic community of practice. *Journal of Agricultural Education, 56*(3), 210-226. doi:10.5032/jae.2015.03210

Rots, I., Aelterman, A., Devos, G., & Vlerick, P. (2010). Teacher education and the choice to enter the teaching profession: A prospective study. *Teaching and Teacher Education, 26*(8), 1619–1629.

Sorensen, T. J., Lambert, M. D., & McKim, A. J. (2014). Examining Oregon agriculture teachers' professional development needs by career phase. *Journal of Agricultural Education, 55*(5), 140-154. doi:10.5032/jae.2014.05140

Tippens, A., Ricketts, J. C., Morgan, A. C., Navarro, M., & Flanders, F. B. (2013). Factors Related to Teachers’ Intention to Leave the. *Journal of Agricultural Education, 54*(4), 58-72. doi:10.5032/jae.2013.04058

Touchstone, A. (2015). Professional development needs of beginning agricultural education teachers in Idaho. *Journal of Agricultural Education, 56*(2), 170-187. doi:10.5032/jae.2015.02170

**Viewer Reactions to Agriculture-related Facebook Videos:   
Implications for Agricultural Literacy Efforts**

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*With the increased popularity of online videos and the use of videos by agriculture to share information about the industry and engage with online audiences, it has become important to understand what drives user engagement for these videos. This understanding could increase the positive impact of agricultural literacy efforts that disseminate video messages through social media platforms. This study examined videos produced by students enrolled in a Texas Tech University undergraduate course and the reactions and willingness to share those videos by the course magazine’s Facebook followers and currently enrolled college of agriculture students. This study utilized multiple data collection methods to evaluate participant reactions to nine videos selected for this research from the online library of videos created during previous semesters. The videos with the highest views, the median views and the lowest views were chosen, and a questionnaire was created and administered to online and face-to-face participants. Results of the study showed that video quality was more important to viewers than video length. Participants also indicated that videos pertaining to important animals had the highest likelihood of being viewed longer than other videos and were more likely to be shared.*

**Introduction**

Since Tim-Berners Lee connected hypertext technology to the Internet and created the World Wide Web in 1991, the Internet has become a way for people to connect and communicate with the world around them (Dijick, 2013). As the Internet evolved, web based videos became one of the fastest growing forms of entertainment and the most popular Internet activity (Guadagno, et al., 2013) arguably due to the emergence of social media platforms which give users virtual places to gather to communicate, share and discuss ideas (Raacke, & Bonds-Raacke, 2008). The driving force behind these social networking sites is User Generated Content (UGC) (Krumm, Davies & Narayanaswami, 2008). Today, Internet users can utilize social media platforms to do such things as create, modify, and share content (Kietzmann, et al., 2011). Facebook is one of the most popular social media and networking sites online (Kabani, 2010), with over 1.71 billion monthly active users (MAUs) as of 2016. Facebook is used for several purposes in today’s society, including marketing, advertising, and social outreach (Graybill, et al., 2011) and allows users to create and upload new content including short videos. The creation of online videos for Facebook has become a popular activity among the millennial generation and includes some aspects of social networking as well as multimedia design and programing (Vedantham, 2001). Coupled with the launch of YouTube in February 2005, the creation and submission of videos to websites like YouTube, web based videos accounted for 90% of consumer Internet bandwidth use (Bardzell, Bardzell & Pace, 2008). By 2011, over half of global consumer Internet traffic was dedicated to video streaming (Hoßfeld et al., 2013).

These recent Internet-based technological advances combined with mobile computing and communication technologies (i.e. smartphones) have given rise to a participatory culture (Jenkins, et al., 2009) allowing people “to creatively respond to a plethora of electronic signals and cultural commodities in ways that surprise their makers, finding meanings and identities never meant to be there and defying simple nostrums that bewail the manipulation or passivity of ‘consumers’” (Willis, 2003, p. 392). This participatory culture and the technology advances provides both opportunities and challenges to agricultural literacy efforts. Doerfert (2003) concluded that changes in participant behavior because of agricultural literacy efforts was not a frequent measure of agricultural education researcher. Examining viewer reaction to agriculture-based Facebook videos and the viewer’s willingness to share the video with others could enhance efforts to increase overall agriculture literacy on a global scale.

**Purpose and Research Objectives**

Despite the constantly increasing popularity of online videos, very little research has been conducted around how video content affects and influences a viewer’s quality of experience and their likelihood to share the information with others. The purpose of this study was to examine the factors that create emotional connections to various agriculture-related Facebook videos, enhancing the likelihood that the videos will be shared with other viewers. The following objectives were used to guide the study: (a) investigate the overall viewer retention rate for nine selected videos posted to Texas Tech University ACOM 4310 *Development of Agricultural Publications* course Facebook page (*The Agriculturist*; http://bit.ly/2uVKHwX) using analytics gathered from Facebook insights; (b) describe participants’ emotional reactions to nine selected videos from the course’s Facebook collection; (c) describe the participants’ personal preference for course’s Facebook video quality and content; (d) identify factors that influence participants’ likelihood to share the nine selected videos from course’s Facebook page.

**Conceptual/Theoretical Framework**

Quality of Experience (QoE) is known as the measure of the overall level of satisfaction a viewer experiences when watching different videos (Balachandran et al., 2013). The focus previous research has been on video elements such as graphics, sound, video length, and genre (classified as confounding factors—all of which can all affect QoE) but not emotional responses or willingness to engage or share the video with others. Pirouz, et al., (2015) defines user engagement as behavior that “includes sharing, but also extends to other forms of measurable user involvement” (p. 85) while O’Brien and Toms (2007) suggest that engagement is a “category of user experience, characterized by attributes of challenge, positive affect, endurability, aesthetic and sensory appeal, attention, feedback, variety/novelty, interactivity and perceived user control” (p. 941). What researchers can agree upon is that engagement should be a pleasurable experience for the viewer and should include intellectual stimulation and challenge (Douglas & Hargadon, 2000; Read, MacFarlane, & Casey, 2002).

The Uses and Gratifications (U&G) theory, as set forth by Blumler and Katz (1974), states that media users play an active role in choosing and using various forms of media. This theory suggests several assumptions, including: that individuals seek out different types of media, that media use is goal directed, media exposure fulfills a variety of human needs, and that individuals seek out media that will gratify their needs (McLeod & Becker, 1981; Palmgreen, Wenner & Rosengrne, 1985). The core of Uses and Gratifications theory can also be strengthened by interactivity. There are several user-oriented interactivity dimensions that may be useful for the U&G approach, including: sociability (Fulk, et al., 1996), threats (Markus, 1994), involvement (Trevino & Webster, 1992), isolation (Dorsher, 1996), inconvenience (Stolz, 1995), benefits (Ang & Cummings, 1994), playfulness, connectedness, reciprocal communication, choice, and information collection (Ha & James, 1998). Friend-networking sites such as Facebook and Twitter provide users with multiple ways of communication and interaction such as posting information, sharing pictures, leaving messages for friends, etc. (Raacke & Bonds-Raacke, 2008). Research has shown the benefits that motivate users to share this type of data include affection, attention seeking, disclosure, habit, information sharing and social influence (Malik, Dhir, & Miemninen, 2016). Oh and Syn (2013) developed a framework for what motivates a person to share information on social media which consisted of ten different definitions of motivation: enjoyment, self-efficacy, learning, personal gain, altruism, empathy, community interest, social engagement, reputation and reciprocity (Oh & Syn, 2013). While all ten definitions are influential in motivating a user to share on social media, learning and social engagement are the two most influential motivations.

**Methods and Procedures**

Nine videos from the available video library on course’s Facebook page were selected for this study. The videos were chosen based on the number of views each received for the Spring 2015, Fall 2015, and Spring 2016 semesters. The videos that received the highest number of views (2,600-132,700 views), the midpoint number of views (711-2,200 views), and the least number of views (249-801 views) for each of the three semesters were selected for this study. This study utilized multiple data collection methods to evaluate participant reaction to the selected videos. It was determined that a multiple methods approach would be the most effective method of obtaining the quantity, as well as the quality of responses desired for this study (Morse, 2003; Johnson & Onwuegbuzie, 2014).

The target population for this study would be those who may view the videos through the course’s Facebook page. Two separate accessible populations were identified. The first was the followers of course’s Facebook page as of July 1, 2016 which was listed at 3,216 followers. Many of the followers of the Facebook page are alums of the course’s thus representing one of the targeted audiences for *Facebook page*. Online participants were recruited using a virtual call-to action which included a link to the questionnaire, that was posted to the publication's Facebook page over a period of one month, August 9 to September 9, 2016. The second accessible population was students on the Texas Tech University (TTU) campus for the Fall 2016 term. This is the secondary audience for the magazine are those who have access the print version of through College of Agricultural Sciences and Natural Resources (CASNR) on-campus distribution racks. The Fall 2016 student enrollment for CASNR was 2,174. CASNR participants were recruited for the face-to-face, on-campus data collection using paper flyers posted in all of CASNR’s buildings on campus along with weekly postings on TTU’s daily digital announcement system. All students are auto enrolled to receive it to their official TTU designated email address.

Participants from both data collection methods (online *N* = 24; face-to-face *N* = 31) were asked to watch each of the nine videos and indicate their emotion-based reaction using the Facebook reaction buttons of like, love, laugh, surprise (wow), cry (sadness), and anger. After reacting to the videos, participants were asked to rate how likely they would be to share each video with the choices of (a) likely/have already shared or (b) unlikely/will never share. If participants indicated they were unlikely to share the video, they were asked to indicate why they would not share the video. The final question each participant answered was to indicate with whom they would be most likely to share the video with. The second section of the questionnaire asked participants to rank the four video subject categories using a numeric scale, and then rank the importance of the three video quality factors of video length, sound and graphics using a five-point, Likert-type scale ranging from “extremely important” to “not important at all”. Participants were then asked to describe their Facebook-related behaviors, including: (a) how often do they watch videos on Facebook; (b) why they have a Facebook account; and (c) why they follow the course’sFacebook page. The final questionnaire was reviewed for content and face validity by a panel of experts. Face and content validity were established by TTU faculty. To determine reliability, a split-half reliability analysis was conducted post-hoc with the collected data yielding a 0.77 score for the instrument. Responses to the online version of the questionnaire were recorded and stored via Qualtrics. After the online survey was closed on September 12, 2016, the recorded responses were downloaded from the Qualtrics server into a Microsoft Excel spread sheet. To be included in the data analysis, the participant had to complete at least 60 percent of the instrument’s video evaluation section. Using SPSS software (version 12.1.0), the researcher ran a chi square test as well as a t-test on the data to determine if there was any significant difference between responses the two different questionnaires. When no significant difference was discovered, the two data sets were merged into one single set for the final data analysis. Descriptive statistics were conducted with frequencies and measures of central tendency reported for each of the study’s four objectives.

**Results and Findings**

Facebook analytics for all every video created for the three semesters in question were gathered using insights available to the administrators of the course’s Facebook page. Using the same insights, each of the nine videos were analyzed for the overall rate of viewer retention, or how long viewers watched each video. The mean number of views for the nine videos was 15,697.2; the median number of views was 588 and was determined to be more representative of central tendency due to the large number of views received by a video (132,700) from the Spring 2015 term. As of July 1, 2016, two of the nine videos had more than 2,500 views. The mean video length was 1:43, while the media length was 1:24. Of the six videos the researcher could collect average watch time data on, the mean watch time was 0:28, and the median and mode were 0:30. The mean video reach was 41,817 people while the median reach was 4,000. During this analysis, a pattern was discovered across the subjects of the nine videos. The three videos with the highest number of views all had subjects pertaining to horses or had horses in the videos, while the three mid-point videos all pertained to animals of some kind.

Of the 453 participant reactions to the nine videos, 61.1% (*n =* 277) were *like* reactions, with six of the nine videos being liked by more than 50% of the participants. Based on comments left by participants, this reaction may be the default reaction due to the fact participants did not feel the other reactions accurately matched their emotions toward the video in question. The reaction of *love* was the second highest chosen emotion, being used 100 times (22.1%) across eight of the nine videos. The three videos that received the most *love* reactions all featured horses. The *shock* reaction was selected 51 times (11.3%), making it the moderately chosen emotion, and both videos with the highest *wow* reactions both featured animals. *Sadness, anger,* and *laughter* all received less than two percent of the reactions. *Sadness* and *laughter* both received seven reactions, and *anger* received ten.

Participants were asked to rate their preference for various video quality and content factors using a five point Likert-type scale of (1) “extremely important” to (5) “not at all important”. Participants indicated that video sound and graphics were the most important factors that affected quality of experience, while video length was viewed as moderately important to the viewing experience. For the reasons participants indicated they would be willing to share the videos, the majority indicated they would share based on their *personal interests or hobbies related to the topic* followed by *wanting others to know about the topic*. Intentionally *wanting others to react to the topic* was chosen the least. The video with the highest Facebook views had the highest share rate from the participants at 87%, while the video with the lowest Facebook views (249 total views) had the lowest share rate by the participants of six percent. Of the reasons not to share a video, participants indicated that video quality was the primary reason.

**Conclusions & Recommendations**

Findings for objective one indicate that viewers of online videos prefer video quality over video quantity. The average video length of the nine videos used in this study was 1:43 and the average rate of viewer retention was 0:28, which indicates many Facebook viewers stopped watching before 50% of the video had been viewed. It was also discovered that video content has a larger influence on a viewer’s retention than the overall length of a video does. It was concluded for objective two that the *like* and *love* reactions were the most used, indicating that if a viewer experiences a positive emotion about a video, they will be more likely to react and then share the video with others. Findings also indicated that videos with the highest number of *love* reactions were all related to animals or important life experiences.

For objective three, results indicate that factors such as sound and graphics affect a viewer’s Quality of Experience more than the video’s length, meaning that if a viewer considers a video to be of high quality, it won’t matter how long the video is, the viewer is more likely to watch the majority or all of the video. It was also concluded that the course magazine’s audience members (Facebook or face-to-face) prefer videos focusing on or featuring animals, more so than videos with subjects of important people or important places. It was concluded for objective four that viewers are more likely to share a video if they feel it gratifies their personal interests or hobbies, or if it meets or gratifies their needs for sharing. As discussed with objectives one and three, viewers prefer a video with a higher content quality, meaning videos with poor production quality are less likely to be shared than a video viewers consider high quality. The most likely reason participants had for not wanting to share a video was that it fit within their personal interests or hobbies, and the second most likely reason was because they want others to know about the topic. Participants also cared the least about wanting to see people’s reactions to something they share.

From previous studies cited in this manuscript. one could assume that video length affects how long a viewer will remain engaged in a video. However, it was discovered through this research that video length has little effect on a viewer’s retention. Further studies should also be conducted to understand how video elements affect a viewer’s Quality of Experience, and thus the shareability of the video, especially when viewed through social media applications such as Facebook. Further, social media users are not confined to watching videos only on their televisions or computers using almost any mobile device with wireless connection capabilities. With cell phone companies producing phones and other mobile devices with increasing screen sizes, the question of “does screen size affect a viewer’s quality of experience when watching online videos?” should be addressed through future research.

As agricultural literacy efforts include or migrate to social media platforms such as Facebook, high quality videos of short duration (under one minute) of compelling stories or which include animals that viewers commonly have a positive emotional attachment (e.g. horses) are more likely to receive a positive emotional reaction from viewers. This positive viewer response will likely increase the shareability of the agricultural literacy message and help increase the understand of agriculture nationally and across the globe.

**References**

Ang. S., & Cummings, L. L. (1994). Panel analysis of feedback-seeking patterns in face-to-face, computer-mediated, and computer-generated communication environments. *Perceptual and Motor Skills, 79*(1)*,* 67-73.

Balachandran, A., Sekar, V., Akella, A., Seshan, S., Stoica, I., & Zhang, H. (2013). Developing a predictive model of quality of experience for Internet video. *Computer Communication Review, 43*(4)*,* 339-350.

Bardzell, J., Bardzell, S., & Pace, T. (2008). Emotion, engagement and internet video. *Emotion,* 417-443. Retrieved from http://67.222.24.243/wp-content/uploads/2009/03/affect-study-screen-view.pdf

Blumler, J. G., & Katz, E. (1974). *The uses of mass communications: Current perspectives on gratifications research.* Beverly Hills, CA: Sage.

Dijck, J. (2013). *The culture of connectivity: A critical history of social media.* New York, NY: Oxford University Press.

Doerfert, D. L. (2003, April). Agricultural literacy: A review of research studies conducted by the agricultural education profession. *Proceedings of the 22nd Annual Western Region Agricultural Education Research Conference*, Portland, OR.

Dorsher, M. (1996, March). Whither the public sphere: Prospects for cybersphere. In *Conference of the Mass Communication and Society Division of the Association for Education in Journalism and Mass Communication,* Grand Forks, ND.

Douglas, Y., & Hargadon, A. (2000, May). The pleasure principle: immersion, engagement, flow. In *Proceedings of the eleventh ACM on Hypertext and hypermedia* (pp. 153-160).

Fulk, J., Flannagin, A. J., Kalman, A. E., Monge, P. R., & Ryan, T. (1996). Connective and communal public goods in interactive communication systems. *Communication Theory, 6*(1)*,* 60-87. DOI: 10.1111/j.1468-2885.1996.tb00120.x.

Graybill-Leonard, M., Meyers, C., Doerfert, D., Irlbeck, E. (2011). Using Facebook as a communication tool in agricultural-related social movements. *Journal of Applied Communications, 95*(3),45-56.

Guadagno, R. E., Rempala, D. M., Murphy, S., & Okdie, B. M. (2013). What makes a video go viral? An analysis of emotional contagion and Internet memes. *Computers in Human Behavior, 29*(6)*,* 2313-2319. DOI: 10.1016/j.chb.2013.04.016.

Ha, L., & James, E. L. (1998). Interactivity reexamined: A baseline analysis of early business Web sites. *Journal of Broadcasting & Electronic Media, 42,* 457-474.

Hoßfeld, T., Schatz, R., Biersack, E., & Plissonneau, L. (2013). Internet video delivery in YouTube: From traffic measurements to quality of experience. In *Data Traffic Monitoring and Analysis* (pp. 264-301). Springer Berlin Heidelberg.

Jenkins, H., Puroshotma, R., Clinton, K., Weigel, M., & Robinson, A. J. (2009). *Confronting the challenges of participatory culture: media educations for the 21st century.* Retrieved from http://www.newmedialiteracies.org/wp-content/uploads/pdfs/NMLWhitePaper.pdf.

Johnson, R. B., & Onwuegbuzie, A. J. (2014). Mixed methods research: a research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Kabani, S. H. (2010). *The zen of social media marketing.* Dallas, TX: BenBella Books.

Kietzmann, J. H., Hermkens, K., McCarthy, I. P., Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons, 54*(3)*,* 241-251.

Krumm, J., Davies, N., & Narayanaswami, C. (2008). User-generated content. *IEEE Pervasive Computing*, *7*(4), 10-11.

Malik, A., Dhir, A., & Miemninen, M. (2016). Uses and Gratifications of digital photo sharing on Facebook. *Telematics and Informatics,* *33*(1), 129-138. DOI: 10.1016/j.tele.2015.06.009.

Markus, M. L. (1994). Finding a happy medium: Explaining the negative effects of electronic communication on social life at work. *ACM Transactions on Information Systems, 14*(2)*,* 119-149. DOI: 10.1145.196734.196738.

McLeod, J. M., & Becker, L. B. (1981). The uses and gratifications approach. In D. D. Nimmo, & K. R. Sanders (Eds.), *Handbook of political communication.* (pp. 61-72). Beverly Hills, CA: Sage.

Morse, J. M. (2003). Principles of mixed methods and multimethod research design. In Tashakkori, A., & Teddlie, C. (2003). *Handbook of Mixed Methods in Social & Behavioral Research* (pp.189-208). Thousand Oaks, Ca.: Sage Publications, Inc.

O’Brien, H. L., & Toms, E. G. (2007). What is user engagement? A conceptual framework for defining user engagement with technology. *Journal of the American Society For Information Science and Technology, 59*(6)*,* 938-955.

Oh, S., & Syn, S. Y. (2013). Motivations for sharing information and social support in social media: A comparative analysis of Facebook, Twitter, Delicious, YouTube and Flicker. *Journal of the Association for Information Science and Technology, 66*(10),2045-2060.

Palmgreen, P., Wenner, L. A., & Rosengren, K. E. (1985). Uses and gratifications research: The past ten years. In K. E. Rosengren, L. A. Wenner, & P. Palmgreen (Eds.), *Media gratifications research* (pp. 11–37). Beverly Hills, CA: Sage.

Pirouz, D. M., Johnson, A. R., Thomson, M., & Pirouz, R. (2015). Creating online videos that engage viewers. *MIT Sloan Management Review, 56*(4),83-88.

Raacke, J. & Bonds-Raacke, J. (2008). MySpace and Facebook: applying the uses and gratifications theory to exploring friend-networking sites. *CyberPsychology & Behavior, 11*(2),169-174. DOI: 10.1089/cp.2007.0056.

Read, J. C., MacFarlane, S. J., & Casey, C. (2002, August). Endurability, engagement and expectations: Measuring children's fun. In *Interaction design and children* (Vol. 2, pp. 1-23). Shaker Publishing Eindhoven.

Stolz, C. (1995). *Silicon snake oil: Second thoughts on the information highway.* New York: Doubleday.

Trevino, L. K., & Webster, J. (1992). Flow in computer-mediated communication: Electronic mail and voice mail evaluation and impacts. *Communication Research, 19*(5)*,* 539-573.

Vedantham, A. (2011). *Making YouTube and Facebook videos: gender differences in online video creation among first year undergraduate students attending a highly selective research university* (Doctoral Dissertation, University of Pennsylvania). Retrieved from http://repository.upenn.edu/library\_papers/75/.

Willis, P. (2003). Foot soldiers of modernity: the dialectics of cultural consumption and the 21st-century school. *Harvard Educational Review,* *73*(3), 390-415.

**The 2013 Newspaper Coverage of the Oklahoma Horse Slaughter Bill: A Content Analysis**

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**Abstract**

*In 2013, the Oklahoma Legislature passed and the governor signed H.B. 199, legalizing horse slaughter in the state. The media in the state reported the issue. Researchers for this study wished to see if the two highest circulating newspapers in the state — The Oklahoman and Tulsa World — presented the issue in an unbiased manner, by conducting a content analysis of all news articles published about the bill. The Hayakawa-Lowry coding system was used to code the articles. Researchers found both papers presented the issue in a biased manner against horse slaughter, due to a lack of attribution in stories.*

**Introduction/Theoretical Framework**

An unwanted horse is “no longer needed or useful, or their owners are no longer interested in or capable of providing care for them either physically or financially” (Monahan, 2012, p. 105). Before 2007, most unwanted horses likely were slaughtered, but an increasing number are exported to Canada and Mexico (Monahan, 2012). According to the Congressional Research Service, in 2006 the United States exported 35,000 live horses to Canada and Mexico, and by 2010 almost 138,000 live horses were transported to those countries (Cowen, 2012).

Americans consumed horsemeat as recently as the 1940s, but horse slaughter is now a controversial issue in the United States (Government Accountability Office, 2011). Horse slaughter opponents include “animal rights advocates, horse enthusiasts, and some state governments” (GAO, 2011, p. 1). Proponents include the livestock and meatpacking industries because of economic impacts and limited alternatives to handling unwanted horses (GAO, 2011).

In 2013, Rep. Skye McNeil authored H.B. 1999, amending the Oklahoma Meat Inspection Act (OMIA) to permit horse slaughter but prohibiting the sale of horsemeat for human consumption (Oklahoma Meat Inspection Act, 2013). The Fifty-Fourth Oklahoma Legislature passed the bill, which Gov. Mary Fallin signed March 29, 2013 (OMIA, 2013). The bill was followed closely by the media, and researchers for this study wanted to know how journalists presented the issue.

Journalists have a responsibility to report news fairly and accurately (Whitaker & Dyer, 2000). They should not take sides in an issue and should attribute all but the most commonly known information (Stovall, 2005). However, readers do not believe reporters portray issues accurately and question their credibility (Pew, 2009). Sitton (2000) found a relationship between journalists’ knowedlege and perceptions of agriculture. Therefore, reporting of agricultural legislation should be studied (Kuykendall, 2010). “Reporters and agricultural communicators can ensure that by disseminating the correct and most relevant information to readers and potential voters, they provide an accurate picture of agricultural legislation” (Kuykendall, 2010, p. 53).

This study was conducted through the lens of the agenda-setting theory. As early as the 1920s, most citizens struggled to comprehend the democracy surrounding them and, as a result, a relationship developed between mass media and the public (Dearing & Rogers, 1996; Iyengar & Kinder, 2010). Lippmann (1925) characterized this problem in his book *The Phantom Public.* His ideas helped set the stage for development of the agenda-setting theory (Dearing & Rogers, 1996). Agenda setting is the idea “the public’s social or political priorities and concerns – their beliefs about what is a significant issue or event – are determined by the amount of news coverage accorded various issues and events” (Ansolabehere, Behr & Iyengar, 1993, p. 142). Cohen (1963) stated the press “may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think *about”* (p. 13).

In 1968, McCombs and Shaw investigated the ability of mass media to set an agenda during the 1968 presidential campaign (McCombs & Shaw, 1972). Their study found “voters tend to share the media’s *composite* definition of what is important” (McCombs & Shaw, 1972, p. 184). They discovered media has the ability to make people believe certain issues, events, or situations are more important than others, usually by dedicating more space in newspapers or time on television news reports to certain subjects.

The original idea of mass media influence on public issues has turned into a broader theory base (McCombs & Funk, 2011). Two levels of agenda setting now exist — the traditional view and attribute (McCombs, 2006). This second level “has shifted the focus of research away from investigating *what* topics news media cover to *how* they cover them” (Kiousis, 2005, p.4). Attribute agenda-setting analyzes the attributes constituting issues (Golan & Wanta, 2001).

**Purpose/Objectives**

The problem addressed in this study was no data existed regarding how the media presented information associated with the 2013 horse slaughter legislation in Oklahoma. The purpose was to analyze content of news articles associated with a horse slaughter bill published by the state’s two highest-circulating newspapers*.* The following objectives were developed to guide the study:

1. Identify all news articles about the horse slaughter bill published by the two highest-circulating Oklahoma newspapers while the bill was under consideration.
2. Conduct quantitative content analysis of identified sentences in selected articles.
3. Describe the differences in article content by source.

**Methods/Procedures**

*The Oklahoman* and the *Tulsa World* newspaperswere selected for this study because of their daily circulation. According to the 2013 *Gale Directory of Publications and Broadcast Media*, *The Oklahoman* had a daily circulation of 190,655 and a Sunday circulation of 283,679. The most recent data at the time of the study for the *Tulsa World* showed daily circulation of 143,582 and Sunday circulation of 206,801 (Gale Group, 2009).

Content analysis methodology for this study was rooted in Hayakawa’s original news bias research and Lowry’s work. The Hayakawa system separated sentences into three categories: reports, inferences, and judgments (Hayakawa & Hayakawa, 1990). The very basic exchange of information is a report, an inference is “a statement about the unknown based on the known,” and judgments are “expressions of the speaker’s approval or disapproval of the occurrences, person, or objects he is describing” (Hayakawa & Hayakawa, 1990, p. 24-25).

Lowry (1985) expanded Hayawaka’s three-category system, by accounting for news attribution and labels:

1. Report sentence/attributed (RA)
2. Report sentence/unattributed (RU)
3. Inference sentence/labeled (IL)
4. Inference sentence/unlabeled (IU)
5. Judgment sentence/attributed/favorable (JAF)
6. Judgment sentence/attributed/unfavorable (JAU)
7. Judgment sentence/unattributed/favorable (JUF)
8. Judgment sentence/unattributed/unfavorable (JUU)
9. All other sentences (O) (Lowry, 1985, p. 574).

Lowry established construct validity for the Hayakawa-Lowry coding system through a two-part study at Ohio University and Liberty University (Lowry, 1985). “The differences measured by these categories when used by researchers in content analysis studies are differences that do indeed make a meaningful difference to news consumers” (Lowry, 1985, p. 580). Lowry (1971) addressed inter-rater reliability by creating a tested rater manual, which was used for this study.

For Objective 1, the researcher searched LexisNexis Academic, with the following terms: “horse slaughter,” “Skye McNiel,” “Senate Bill 375,” and “House Bill 1999.” Articles published between January 17, 2013, (the day the bill was filed) and April 1, 2013, (the Monday after the governor signed the bill) were collected for the analysis. Only articles classified as *news* by LexisNexis were used.

For Objective 2, three trained research assistants coded the articles (Kolbe & Burnett, 1991; Lombard et al., 2002; Potter & Donnerstein, 1999). Each sentence was coded using Lowry’s (1985) news media bias categories, after which codes were compiled to identify discrepancies. The coders then met in two, three-hour sessions to reach consensus on conflicting codes.

For Objective 3, the researcher combined all RA/RU sentences, IU/IL sentences, and JAF/JAU/JUF/JUU sentences to compare the frequency of Hayakawa sentence types and Hayakawa-Lowry sentence types between the two newspapers.

Descriptive statistics were used to evaluate the variables in this study. Measures of central tendency were the primary descriptive statistic used (Creswell, 2012).

**Results/Findings/Conclusions**

**Identification of News Aticles About the Horse Slaughter Bill Published by the Two Highest-Circulating Oklahoma Newspapers**

Thirty articles met the study criteria. Of those articles, 13 were published in *The Oklahoman* and 17 were published in the *Tulsa World.*

Both papers treated the horse slaughter legislation as a newsworthy event*.* Coverage of the issue increased as the governor prepared to sign the bill. At least one source published at least one article each day for five days before the signing, and both newspapers published a story for the three days prior to the signing. Both papers published a story the day after the bill was signed, but neither published a story the day of the signing. This finding supports journalism literature stating timeliness and importance are two factors for determining what is newsworthy (Brooks & Missouri Group, 1999; Harrower, 2010; Mencher, 2011).

**Content Analysis of Identified Sentences in Selected Articles**

A total of 762 sentences were identified and coded. Based on the Hayakawa-Lowry news bias categories, an overall negative bias toward horse slaughter was present in the articles included in this investigation (see Figure 1).

*Figure 1*. Number of sentences in each Hayakawa-Lowry news bias category.

A notable difference existed between the quantity of JUU and JUF sentences. The lack of attribution on judgment/unfavorable sentences suggests bias (Hayakawa & Hayakawa, 1990; Lowry, 1985); therefore, these articles were biased against horse slaughter.

The lack of attribution in the selected articles indicates journalists were more concerned with a story focused on infotainment than an accurate and unbiased story. Journalists reporting on the bill allowed their perceptions or opinions to enter their writing and appeared to take sides on the issue. Journalists must avoid taking sides on an issue (Hirst & Patching, 2005; Stovall, 2005).

The identified articles are part of attribute agenda-setting, as they did not tell people *what* to think about (people already were thinking about the issue) but told people *how* to think (Kiousis, 2005). The manner in which information was presented could have influenced public understanding of the issue (McCombs, 2006).

**Description of Differences in Article Content by Source**

Of the 762 identified sentences, 38.98 % (*f* = 297) were reports, 4.33% (*f* = 33) were inferences, 52.49% (*f* = 400) were judgments, and 4.20 % (*f* = 32) were other (see Table 1).

Table 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Content of Articles by Sentence Type* | | | | | | |
| Newspaper | No. of Articles | No. of Reports | No. of Inferences | No. of Judgments | Other | Total |
| *Tulsa World* | 17 | 181 | 20 | 243 | 26 | 470 |
| *The Oklahoma* | 13 | 116 | 13 | 157 | 6 | 292 |
| Total | 30 | 297 | 33 | 400 | 32 | 762 |

The *Tulsa World* had a higher percentage of JUU sentences than *The Oklahoman. The Oklahoman* had a higher percentage of JUF sentences than the *Tulsa World.* Judgment sentences are considered the most biased (Lowry, 1985); thus, *The Oklahoman* reported the 2013 horse slaughter legislation with less bias.

The *Tulsa World* published 70% of the sentences, which could mean the agenda-setting effect for the horse slaughter issue was more prominent with its readers as attribute agenda-setting theory tells people how to think about the issue (Golan & Wanta, 2001; McCombs, 2006). Thus, the *Tulsa World* was more interested in influencing public opinion of the issue than *The Oklahoman.*

**Recommendations/Implications**

Higher education should focus on teaching objective, fair, and balanced reporting. The use of attributed judgment sentences is acceptable, but a balance should occur between judgments and report sentences (Hayakawa & Hayakawa, 1990). Agricultural communications and journalism curricula should stress the importance of attribution to ensure credibility and help remove reporter bias. Agricultural communications and journalism professionals and students should also be exposed to the Hayakawa-Lowry news bias categories to understand the importance of unbiased writing. Agricultural communicators and organizations should work to ensure journalists are better informed about agricultural issues, as Sitton (2000) found a positive correlation between journalists knowledge of agriculture and objectively covering an issue.

Legislators should use news stories to gather information and opinions on issues, but they should not depend solely on news stories to determine public opinion on an issue. Legislators should understand the idea of agenda-setting and its ability to influence public opinion and public policy (Rogers & Dearing, 1996).

Future research should examine how the horse slaughter issue was portrayed in editorials and in other media as well as how legislators use media coverage in voting decisions. Research should examine the extent framing of agricultural issues contributes to attribute agenda-setting theory.

**References**

Ansolabehere, S., Behr, R., & Iyengar, S. (1993). *The media game: American politics in the television age*. Needham Heights, MA: Allyn and Bacon.

Brooks, B. S., & Missouri Group. (1999). News reporting and writing. Boston: Bedford/St.

Martin's.

Cohen, B. (1963). *The press and foreign policy.* Princeton, NJ: Princeton University Press.

Cowen, T. (2012). *Horse slaughter prevention bills and issues.* (Report No. RS21842). Washington, D.C.: Congressional Research Service.

Creswell J. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Boston: Pearson.

Dearing, J. & Rogers, E. (1996). *Agenda-setting.* Thousand Oaks, CA: SAGE Publications.

Gale Group, & Gale Research Inc. (2009). *Gale directory of publications and broadcast media.* Detroit, MI: Gale Research Inc.

Gale Group, & Gale Research Inc. (2013). *Gale directory of publications and broadcast media.* Detroit, MI: Gale Research Inc.

Golan, G. & Wanta, W. (2001). Second-level agenda setting in the New Hampshire primary: A comparison of coverage in three newspapers and public perceptions of candidates. *Journalism and Mass Communication Quarterly*, *78*(2), 247-259.

Harrower, T. (2010). *Inside reporting: A practical guide to the craft of journalism*. New York: McGraw-Hill.

Hayakawa, L.L. & Hayakawa, A. R. (1990). *Language in thought and action.* (5th ed.). Orlando, FL: Harcourt Brace Jovanovich.

Hirst, M., & Patching, R. (2005). *Journalism ethics: Arguments and cases*. Oxford: Oxford University Press.

Iyengar, S., & Kinder, D. (2010). *News that matters: Television and American opinion*. (Updated Edition ed.). Chicago, IL: The University of Chicago Press.

Kiousis, S. (2005). Compelling arguments and attitude strength: Exploring the impact of second-level agenda setting on public opinion of presidential candidate images. *The Harvard International Journal of Press/Politics*, *10*(3), 3-26.

Kolbe, R. H. & Burnett, M. S. (1991). Content-analysis research: An examination of applications with directives for improving research reliability and objectivity. *Journal of Consumer Research,* 18(2), 243-250.

Kuykendall, K. A. (2012). *Selected newspaper coverage of the 2008 California Proposition 2: A content analysis* (Doctoral dissertation, Oklahoma State University).

Lippmann, W. (1925). *The Phantom Public.* New York: Harcourt, Brace and Company.

Lombard, M., Snyder‐Duch, J., & Bracken, C. C. (2002). Content analysis in mass communication: Assessment and reporting of intercoder reliability. *Human Communication Research*, *28*(4), 587-604.

Lowry, D. T. (1971). Agnew and the network TV news: A before/after content analysis. *Journalism Quarterly,* 48(1), 205-210.

Lowry, D. T. (1985) Establishing construct validity of the Hayakawa-Lowry news bias categories. *Journalism Quarterly*, 62(3), 573-580.

McCombs, M. (2006). A look at agenda-setting: Past, present and future. *Journalism Studies,* 6(4), 543-557.

McCombs, M., & Funk, M. (2011). Shaping the agenda of local daily newspapers: a methodology merging the agenda setting and community structure perspectives. *Mass Communication and Society*, *14*(6), 905-919.

McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *The Public Opinion Quarterly*, *36*(2), 176-187.

Mencher, M. (2001). *Melvin Mencher’s news reporting and writing*. New York, NY: McGraw-Hill.

Monahan, C. J. (2012). *Equine welfare concerns: Horse slaughter, wild and unwanted horses*. New York: Nova Science Publishers.

Oklahoma Meat Inspection Act. Okla. Session Law § 2-5-9 (2013)

PewResearch Center. (2009). *Public evaluations of the news media: 1985-2009.* Retrieved from http://www.people-press.org/files/legacy-pdf/543.pdf.

Potter, W. J., & Levine‐Donnerstein, D. (1999). Rethinking validity and reliability in content analysis. *Journal of Applied Communications Research,* 27(1999), 258-284.

Sitton, S. (2000). 1998 Newspaper Coverage of Oklahoma Swine Production Issues: A Content Analysis. Unpublished doctoral dissertation, Oklahoma State University, Stillwater, OK.

Stovall, J. (2005). *Journalism: Who, what, when, where, why and how.* Boston, MA: Pearson/Allyn & Bacon.

United States Government Accountability Office. (2011). *Action needed to address unintended consequences from cessation of domestic slaughter* (GAO-11-228). Retrieved from http://www.gao.gov/new.items/d11228.pdf.

Whitaker, B. K. & Dyer, J. E. (2000). Identifying sources of bias in agricultural news reporting. *Journal of Agricultural Education*, *41*(4), 125-133.

**Examining the Adoption and Use of The Agricultural Experience Tracker in Oklahoma School-Based Agricultural Education Programs**

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**Abstract**

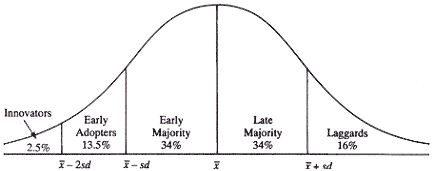
*The purpose of this study was to describe the level of adoption and use of The Agricultural Experience Tracker (the AET) by school-based agricultural education (SBAE) programs in Oklahoma. In alignment with Rogers’ (2003) model for adopter categorization, all SBAE programs in Oklahoma (N = 357) were categorized by innovativeness regarding adoption and use of the AET. Using an archival research approach, innovativeness scores were derived from data pertaining to each Oklahoma SBAE programs’ utilization of selected features of the AET in 2015. As indicated by the findings, even though nearly three-fourths of all SBAE students in Oklahoma had active accounts on the AET, only one-fourth had SAE records on the AET. Of all five adopter categories, the laggards (n = 56) utilized each selected feature of the AET to the lowest extent. In contrast, the innovators (n = 4) were found to have the greatest percentage of students with profiles on the AET, as well as the most logins, journal hours, and journal entries. However, the SBAE programs comprising this category had relatively low percentages of students with active accounts on the AET and students with SAE records on the AET.*

**Introduction and Theoretical Framework**

Notwithstanding the seemingly universal belief that Supervised Agricultural Experience (SAE) is a vital component of the total, school-based agricultural education (SBAE) program (Wilson & Moore, 2007), a trend of declining SAE participation has been reported for the last several decades (Dyer & Osborne, 1995; Moore, 1979; Osborne, 1988; Retallick & Martin, 2005; Steele, 1997). Although research has yielded several different deterrents to SAE, challenges associated with record keeping have surfaced in noticeable quantities (Foster, 1986; Layfield & Dobbins, 2002; Miller & Scheid, 1984; Pfister, 1983; Wilson & Moore, 2007).

Perhaps in an effort to address the aforementioned challenges, several electronic, record keeping innovations have entered the marketplace (Ermis & Dillingham, 2002; EZ Records, 2017; FFA Record Book Pro, 2016; The Agricultural Experience Tracker, 2017). One web-based, record keeping system, The Agricultural Experience Tracker (the AET), appears to have successfully begun its diffusion within the SBAE profession (The Agricultural Experience Tracker, 2017; National FFA Organization, 2013). In recognition of the innovation’s increasing prevalence, the Agricultural Education Division of the Oklahoma Department of Career and Technology Education (CareerTech) made an authority innovation-decision to adopt the AET as Oklahoma’s official, SAE record keeping medium (J. Staats, personal communication, December 1, 2015). However, as an innovation, the AET has been narrowly researched, and no literature regarding its diffusion or adoption presently exists. Therefore, to address this paucity of research, this study was framed by Rogers’ (2003) diffusion of innovations theory.

To better recognize and predict the characteristics of those who choose to adopt an innovation and those who do not, Rogers (2003) proposed a model of adopter categorization (see Figure 1). Specifically, Rogers’ (2003) five adopter categories are “(1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards” (p. 22). Rogers (2003) characterized the *innovators* as being “venturesome” (p. 282) and open to new ideas and experiences. Described as the category holding the greatest magnitude of *opinion leadership*, *early adopters* generally hold the respect of their peers (Rogers, 2003). Though generally lacking in the area of opinion leadership, those in the *early majority* serve as a major tie for communication between the earlier and later adopters (Rogers, 2003), and are described as being very deliberate decision-makers (Rogers, 2003). Similar to the early majority, the *late majority* also accounts for approximately one-third of all potential adopters in a social system (Rogers, 2003). Members of the late majority are often skeptical about adopting a new innovation until they succumb to peer or economic pressures (Rogers, 2003). The *laggards*, the last members of any social system to adopt a new innovation, hold tightly to traditions and are suspicious of change (Rogers, 2003).



*Figure 1.* Rogers’ (2003) Model of Adopter Categorization.

**Purpose of the Study**

The purpose of this study was to describe the level of adoption and use of the AET by SBAE programs in Oklahoma. This study was guided by two research questions:

1. To what extent did SBAE programs in Oklahoma utilize selected features of the AET in 2015?
2. To what extent did SBAE programs in Oklahoma from each adopter category utilize selected features of the AET in 2015?

**Methods**

The target population of this study included all SBAE programs in Oklahoma (*N* = 357). Of these programs, 292 were single-teacher departments, 55 were two-teacher departments, nine were three-teacher departments, and one was a four-teacher department (Oklahoma Department of Career and Technology Education, 2016). Provided the size of the population (*N* = 357), the researchers opted to employ a census approach (Gay et al., 2009).

In accordance with Rogers’ (2003) model, it was decided that each SBAE program in Oklahoma would be categorized by innovativeness regarding adoption and use of the AET. As defined by Rogers (2003), innovativeness is “the degree to which an individual (or other unit of adoption) is relatively earlier in adopting new ideas than other members of a system” (p. 267). However, because adoption of the AET was mandated among the entire social system, the innovation was essentially adopted by every SBAE program in Oklahoma at the same time. As such, for the purpose of this study, *innovativeness* was operationalized as the degree to which each SBAE program in Oklahoma utilized selected features of the AET in 2015. To accomplish this, the researchers employed an archival research approach (Privitera, 2017).

A de-identified dataset including 215 unique variables indicative of each Oklahoma SBAE program’s use of the AET in 2015 was provided by the AET. To determine which metrics would be most indicative of SBAE program innovativeness, the researchers consulted a panel of experts comprised of agricultural education faculty from Oklahoma State University and Texas A&M University. In total, 19 metrics were selected to be used for categorization. To standardize the values associated with each of these metrics, *z* scores were calculated (Gay et al., 2009). After every SBAE program received a *z* score for each metric, a composite mean of the *z* scores was reported as the program’s scaled innovativeness score. All programs were then ranked in descending order and placed into the proposed adopter categories according to Rogers’ (2003) specified percentages (see Table 1).

Table 1

*Total SBAE Programs in Oklahoma in Each of Rogers’ (2003) Adopter Categories*

|  |  |  |  |
| --- | --- | --- | --- |
| Adopter Category | % | *n* | x̅ innovativeness |
| Innovators | 2.50 | 9 | 26.85 |
| Early Adopters | 13.50 | 48 | 12.18 |
| Early Majority | 34.00 | 122 | 2.55 |
| Late Majority | 34.00 | 122 | – 4.08 |
| Laggards | 16.00 | 56 | –10.09 |

**Findings**

Research question one was intended to describe the extent to which all SBAE programs in Oklahoma (*N* = 357) utilized selected features of the AET in 2015. The following means and standard deviations were found for each metric: percentage of students with active accounts on the AET (*M* = 71.65; *SD* = 24.44); percentage of students with profiles on the AET (*M* = 36.94; *SD* = 49.25); percentage of students with SAE records on the AET (*M* = 25.51; *SD* = 25.12); student logins per student (*M* = 3.52; *SD* = 4.05); student logins per teacher (*M* = 205.45; *SD* = 266.03); teacher logins per teacher (*M* = 51.08; *SD* = 48.62); percentage of unique student logins (*M* = 74.45; *SD* = 48.32); journal hours per student (*M* = 25.00; *SD* = 40.01); journal entries per student (*M* = 2.82; *SD* = 4.53); journal entries per student login (*M* = 1.38; *SD* = 4.73); percentage of students with journal entries (*M* = 39.86; *SD* = 38.86); course-related journal entries per student with journal entries (*M* = 0.56; *SD* = 1.79); SAE-related journal entries per student with journal entries (*M* = 1.82; *SD* = 8.14); FFA-related journal entries per student with journal entries (*M* = 1.95; *SD* = 2.37); non-FFA-related journal entries per student with journal entries (*M* = 0.08; *SD* = 0.30); FFA office-related journal entries per student with journal entries

Table 2

*Oklahoma SBAE Programs’ Utilization of Selected Features of the AET in 2015 by Adopter Category (N = 357)*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Innovators  (*n* = 9) | | Early Adopters  (*n* = 48) | | Early Majority  (*n* = 122) | | Late Majority  (*n* = 122) | | Laggards  (*n* = 56) | |
|  | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Students with active accounts (%) | 68.47 | 23.72 | 84.20 | 20.88 | 78.36 | 19.04 | 72.02 | 19.53 | 45.95 | 29.40 |
| Students with profiles on the AET (%) | 79.51 | 45.48 | 63.80 | 53.90 | 47.15 | 51.38 | 21.69 | 39.92 | 18.02 | 39.56 |
| Students with SAE records (%) | 30.80 | 26.27 | 47.11 | 25.00 | 31.88 | 25.05 | 19.80 | 20.97 | 4.69 | 9.95 |
| Student logins per student | 12.59 | 11.49 | 8.67 | 4.38 | 4.04 | 2.43 | 1.78 | 1.22 | 0.33 | 0.49 |
| Student logins per teacher | 858.61 | 848.75 | 465.33 | 267.64 | 239.33 | 201.47 | 100.49 | 73.13 | 32.58 | 69.80 |
| Teacher logins per teacher | 123.44 | 107.80 | 95.02 | 75.47 | 62.16 | 35.52 | 33.20 | 20.82 | 16.59 | 16.80 |
| Unique student logins (%) | 94.00 | 74.21 | 111.46 | 38.66 | 92.04 | 40.86 | 67.37 | 39.28 | 17.25 | 24.49 |
| Journal hours per student | 121.66 | 144.52 | 65.60 | 39.27 | 28.77 | 26.74 | 9.29 | 11.30 | 0.71 | 2.24 |
| Journal entries per student | 16.16 | 14.50 | 8.74 | 4.58 | 2.73 | 1.74 | 0.88 | 0.83 | 0.04 | 0.09 |
| Journal entries per student login | 6.17 | 12.15 | 3.34 | 9.61 | 1.15 | 2.40 | 1.07 | 3.20 | 0.09 | 0.23 |
| Students with journal entries (%) | 81.65 | 59.78 | 85.77 | 33.41 | 50.86 | 34.94 | 24.91 | 23.91 | 2.41 | 6.35 |
| Course-related journal entries\* | 6.79 | 7.39 | 1.32 | 2.07 | 0.32 | 0.67 | 0.20 | 0.44 | 0.19 | 0.65 |
| SAE-related journal entries\* | 21.76 | 46.52 | 3.09 | 4.53 | 1.45 | 3.06 | 1.00 | 1.48 | 0.11 | 0.29 |
| FFA-related journal entries\* | 2.80 | 2.79 | 3.27 | 2.80 | 2.63 | 2.66 | 1.46 | 1.67 | 0.29 | 0.79 |
| Non-FFA-related journal entries\* | 0.45 | 0.93 | 0.24 | 0.50 | 0.09 | 0.26 | 0.02 | 0.11 | 0.00 | 0.00 |
| FFA office-related journal entries\* | 1.62 | 3.16 | 0.22 | 0.33 | 0.16 | 0.30 | 0.07 | 0.18 | 0.03 | 0.10 |
| CDE-related journal entries\* | 1.79 | 3.27 | 1.54 | 1.38 | 1.43 | 1.33 | 0.76 | 0.89 | 0.10 | 0.28 |
| Committee-related journal entries\* | 0.08 | 0.22 | 0.04 | 0.13 | 0.02 | 0.07 | 0.00 | 0.01 | 0.00 | 0.00 |
| School/community-related journal entries\* | 1.27 | 1.54 | 1.29 | 1.33 | 1.00 | 1.11 | 0.39 | 0.54 | 0.07 | 0.22 |

*Note.* \*Indicates the number of journal entries per student with journal entries.

(*M* = 0.15; *SD* = 0.58); CDE-related journal entries per student with journal entries (*M* = 1.02; *SD* = 1.28); committee-related journal entries per student with journal entries (*M* = 0.02; *SD* = 0.07); and school and community-related journal entries per student with journal entries (*M* = 0.69; *SD* = 1.00).

Research question two sought to describe the extent to which the Oklahoma SBAE programs comprising each adopter category utilized selected features of the AET in 2015. Of all five adopter categories, the innovators (*n* = 9) were found to have the largest mean percentage of students with profiles on the AET (*M* = 79.51; *SD* = 45.48), as well as the most student logins per student (*M* = 12.59; *SD* = 11.49), student logins per teacher (*M* = 858.61; *SD* = 848.47), teacher logins per teacher (*M* = 123.44; *SD* = 107.80), journal hours per student (*M* = 121.66; *SD* = 144.52), journal entries per student (*M* = 16.16; *SD* = 14.50), and journal entries per student login (*M* = 6.17; *SD* = 12.15; see Table 2). However, the innovators had the second lowest mean percentage of students with active accounts on the AET (*M* = 68.47; *SD* = 23.72), and the third lowest mean percentage of students with SAE records on the AET (*M* = 30.80; *SD* = 26.27).

In contrast, for each of the 19 metrics, the laggards (*n* = 56) presented the lowest composite means of the five adopter categories. Less than one-half of all students enrolled in SBAE programs in this adopter category were found to have active accounts on the AET (*M* = 45.95; *SD* = 29.40; see Table 2). In addition, less than 5% of these students had SAE records on the AET (*M* = 4.69; *SD* = 9.95), and less than 3% had journal entries on the AET (*M* = 2.41; *SD* = 6.35). Compared to those categorized as the innovators, these SBAE programs were found to have approximately 107 fewer teacher logins per teacher (*M* = 16.59; *SD* = 16.80), and 12 fewer student logins per student (*M* = 0.33; *SD* = 0.49).

**Conclusions, Recommendations, and Implications**

Record keeping has been recognized as an essential skill associated with the success of SAE programs (Boone, 2010; Camp et al., 2000; Davis & Williams, 1979; Jenkins & Kitchell, 2009). However, as revealed by this study, only one-fourth of all students enrolled in SBAE programs in Oklahoma had SAE records on the AET in 2015. As such, it may be implied that the remaining 75% of students in these programs were either maintaining records in another fashion, neglecting the practice of record keeping altogether, or lacking SAE programs. Moreover, despite utilizing the AET to the greatest extent, the SBAE programs categorized as the innovators had one of the lowest percentages of individual student users. Perhaps the intense utilization of the AET among these programs can be attributed to a greater placement of emphasis on student recognition. But where does that leave those students less motivated by FFA degrees and awards?

It is to be determined whether the low percentage of SBAE students with SAE records on the AET is more indicative of a limited degree of utilization of the AET, or of a limited degree of SAE participation. Because both SAE participation and utilization of the AET have been mandated in Oklahoma, additional research is recommended to address the apparent incongruence between policy and practice. A series of replications in other states is also recommended. Further investigation of this innovation’s diffusion is needed in both mandated and voluntary use contexts. In addition to allowing for comparisons to be made among different social systems, these replicated studies may also allow for the identification of opinion leaders in each state (Rogers, 2003).

**References**

Boone, H. N. (2010, July/August). Looking back to move forward: Supervised experience programs in the 21st century. *The Agricultural Education Magazine, 83*(1), 2. Retrieved from http://www.naae.org/profdevelopment/magazine/archive\_issues/Volume83/2010\_0 7-08.pdf

Camp, W. G., Clarke, A., & Fallon, M. (2000). Revisiting supervised agricultural experience. *Journal of Agricultural Education*, *41*(3), 13-22. doi:10.5032/jae.2000.03013

Davis, D. L., & Williams, D. L. (1979). Importance of supervised occupational experience program records in developing selected abilities. *Journal of Agricultural Education*, *20*(3), 19-24. doi:10.5032/jaatea.1979.03019

Dyer, J. E., & Osborne, E. W. (1995). Participation in supervised agricultural experience programs: A synthesis of research. *Journal of Agricultural Education, 36*(1), 6-14. doi:10.5032/jae.1995.01006

Ermis, L. & Dillingham, J. (2002). MyAgRecord: An online career portfolio management tool for high school students conducting supervised agricultural experience programs. *2002 Association of Career and Technical Education Conference. Las Vegas, NV.* Retrieved from http://files.eric.ed.gov/fulltext/ED475158.pdf

EZ Records. (2017). *About EZ Records*. Author. Retrieved from http://ezrecords.aces.illinois.edu/about\_EZRecords.html

FFA Record Book Pro. (2016). *History of FFA record book pro*. Author. Retrieved from http://www.ffarecordbook.com/History.html

Foster, R. M. (1986). Factors limiting vocational agriculture student participation in supervised occupational experience programs in Nebraska. *Journal of the American Association of Teacher Educators in Agriculture, 27*(4), 45. doi:10.5032/jaatea.1986.04045

Gay, L. R., Mills, G. E., & Airasian, P. (2009). *Educational research: Competencies for analysis and applications* (9th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Jenkins, C., & Kitchel, T. (2009). Identifying quality indicators of SAE and FFA: A delphi approach. *Journal of Agricultural Education, 50*(3), 33-42. doi:10.5032/jae.2009.03033

Layfield, K. D., & Dobbins, T. R. (2003). Inservice needs and perceived competencies of South Carolina agricultural educators. *Journal of Agricultural Education, 43*(4), 46-55. doi:10.5032/jae.2002.04046

Miller, W. W., & Scheid, C. L. (1984). Problems of beginning teachers of vocational agriculture in Iowa. *Journal of the American Association of Teacher Educators in Agriculture*, *25*(4), 2-7. doi:10.5032/jaatea.1984.04002

Moore, G. E. (1979, April). Back to the basics in teaching agriculture – The project plan. *The Agricultural Education Magazine, 51*(10), 219-220. Retrieved from http://www.naae.org/ profdevelopment/magazine/archive\_issues/Volume51/v51i10.pdf

National FFA Organization. (2013). *National FFA partners with the agricultural experience tracker* [Press release]. Retrieved from https://pulse.ffa.org/index.php/2013/05/02 /national-ffa-partners-with-the-agricultural-experience-tracker/

Oklahoma Department of Career and Technology Education. (2016). *Agricultural Education Teacher and Staff Directory*. Stillwater, OK: Oklahoma Department of Career and Technology Education.

Osborne, E. W. (1988). SOE programs in Illinois--Teacher philosophies and program characteristics. *The Journal of the American Association of Teacher Educators in Agriculture*, *29*(3), 35-42. doi:10.5032/jaatea.1988.03035

Pfister, J. A. (1983). *An evaluation of the student teaching program in agricultural education at the Ohio state university regarding student teaching experiences and assignments and the performance of university supervisors and cooperating teachers* (Doctoral dissertation). Retrieved from ProQuest. (8311789)

Privitera, G. J. (2017). *Research methods for the behavioral sciences* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Retallick, M. S., & Martin, R. A. (2005). Economic impact of supervised agricultural experience in Iowa: A trend study. *Journal of Agricultural Education, 46*(1), 44-54. doi:10.5032/jae.2005.01044

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: The Free Press.

Steele, R. (1997). Analysis of the continuing decline in use of supervised agricultural experience (SAE) in New York state. *Journal of Agricultural Education, 38*(2), 49-58. doi: 10.5032/jae.1997.02049

The Agricultural Experience Tracker. (2017). *Agricultural education online recordkeeping system*. Author. Retrieved from https://www.theaet.com

Wilson, E., & Moore, G. (2007). Exploring the paradox of supervised agricultural experience programs in agricultural education. *Journal of Agricultural Education, 48*(4), 82-92. doi:10.5032/jae.2007.04082

**The Role of News Sources in Shaping Risk Perceptions of Agricultural Use of Pesticides**

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**Abstract**

*This study conducts a secondary analysis of the 2016 General Social Survey Ballot 2 data (Sample N=859) to investigate how the US public form their risk perceptions of agricultural use of pesticides. Results show that females, those who are pessimistic about scientific advances and concerned about environmental quality tend to perceive pesticides to be more hazardous. In addition, people who rely on television as primary sources of science news are less likely to think pesticide is dangerous compared with those who primarily use online-only news. Although the Internet allows its users to selectively expose to information that aligns with their generally optimistic attitudes toward science and hence attenuates their risk perceptions, the same function does not apply to printed media and television. Implications on risk communications are discussed.*

**Introduction**

Pesticides have been extensively applied in agriculture and urban settings to control weeds, insects and other pests. The use of pesticides has resulted in a range of benefits, including increased crop production and decreased insect-borne disease (Aktar, Sengupta, & Chowdhury, 2009). Nonetheless, the agricultural use of pesticides also raises persistent concerns about possible adverse effects on the environment, including water quality and biodiversity (Crosbyl, 1973). Claiming the detrimental effects of pesticides on birds, the book *Silent Spring* raised concerns over the environmental fate of pesticides. Surveys of groundwater and raw drinking water in the US detected a high level of pesticide concentration exceeding the maximal accepted standards in many other industrialized countries (USGS, 2014). Recent researches have further detected pesticides in high-altitude regions, demonstrating sufficient persistence to carry them in the atmosphere (Fenner, Canonica, Wackett, & Elsner, 2013).

For decades, discussions among scientists and the public have focused on the real, projected, and perceived risks that pesticides pose to human health and the environment (Damalas, 2009). People without direct experiences with agriculture have to rely on external information sources, such as mass media, to assess the safety of pesticides (Wachinger, Renn, Begg, & Kuhlicke, 2013). Previous studies have shown that individuals tend to selectively expose to media content and use their own frames of reference to create perceptions of reality (Kunda, 1990). Most people use media coverage to form opinions that align with their preexisting attitudes (Slater & Rasinski, 2005). Although agricultural use of pesticides presents a chronic environmental risk that rarely receives intense media attention, active news users may rely on media’s presentation of similar hazards to infer the degree of risks associated with pesticide use in farming.

**Theoretical Frameworks**

Mass media serve as a potential constructor, transmitter and amplifier of risks. Mass media generally place a priority on spectacular and sensational events (Freudenburg, Coleman, Gonzales, & Helgeland, 1996). Reporting about natural disasters, such as earthquakes, hurricanes, droughts or floods, is shown to be consistently preferred by news organizations over chronic hazards, such as exposure to asbestos dust and pesticide-dependent farming. According to the *social amplification of risk* framework, mass media can amplify environmental risks and enlarge the extent to which particular risky events, such as natural disasters, can be imagined (Kasperson et al., 1988). For example, repeated news stories of Japan’s 2011 Fukushima Daiichi nuclear accident mobilized the US public’s latent concerns about the safety of nuclear power 3 plants and enhanced their recollection of previous accidents, such as those at Chernobyl and Three Mile Islands (Friedman, 2011).

Nonetheless, different media platforms are shown to cover risks in different ways and can exert distinct effects on audiences’ risk perceptions. Printed media, including online versions of the same outlets, often cover emerging technologies through the lens of health-related risks (e.g., Dudo, Dunwoody, & Scheufele, 2011). Newspapers and magazines also tend to provide in-depth information to contextualize the covered risks (Allan, Adam, & Carter, 2000). In contrast, television news positions ordinary people to symbolize or simply stand for ordinary feelings and response to the consequences of environmental risks (Allan et al., 2000). Television coverage does, however, routinely help visualize “a deep-seated cultural sensibility towards the environment widely felt to be under threat from advancing industrialism and despoliation” (Cottle, 2000, p. 32). While online media, such as blogs and online-only magazines, have increased the amount of environment coverage, much content contains emotionally charged materials and concentrates on mobilizing collective actions (Krimsky, 2007). In addition, news consumption via social media, such as Facebook and Twitter, has been interwoven with social group interactions (Brossard, 2013). On these platforms, individuals’ interpretation of risks will tend to be integrated into larger frames of values shared by their in-group peers and to become resistant to new, conflicting information (Brossard, 2013).

Additionally, various personal factors such as experience, values, and attitudes influence individuals’ judgement about the seriousness and acceptability of risks (Wachinger et al., 2013). Previous researches have shown that increased concerns over pesticide use correspond to the emergence of a more general concern about environmental quality and the distrust of governmental regulations (Damalas, 2009). What’s more, scientific optimism, an attitudinal construct representing respect for the intentions of scientists and a sense that science and technology provide useful results for society, has been shown to correlate with individuals’ risk perceptions of technologies (Nisbet & Markowitz, 2016). Science optimists who hold a strong belief in the promise of science and technology are generally less likely to have concerns about negative impacts (Nisbet & Markowitz, 2016). These values may direct individuals to selectively expose to news stories congruent to their beliefs and hence either amplify or attenuate the effects of such stories on risk perception.

**Purpose and Objectives**

Using the 2016 General Social Survey (GSS), this study investigated how Americans form their risk perceptions of agricultural uses of pesticides. In particular, we examined the effects of personal factors (e.g., age, gender, education, scientific optimism and environmental concerns) and informational factors, including individuals’ primary sources of science news. The overall purpose is to understand the dynamics of public opinion formation regarding pesticide risks. Three specific objectives guide the study:

1. To examine the dynamics underlying the formation of risk perception of pesticides;

2. To investigate the main effects of different science news sources (i.e. printed, broadcast and online-only media) on risk perception of pesticides;

3. To understand how people’ selectively exposure to attitudinally congruent content on different media platforms may influence risk perceptions.

**Methods**

**Data**

We used the 2016 GSS Ballot 2 dataset (N = 859). Data were collected between February and April, 2016 using face-to-face interviews. The median length of interviews was one and a half hours. The Ballot 2 cross-section asked respondents about their attitudes toward a variety of scientific and environmental issues. The response rate was 70%.

**Dependent Variable**

**Risk perception of agricultural use of pesticides**. The dependent variable was measured by a single item asking “do you think that pesticides and chemicals used in farming are []?” on a 5-point scale (1 = “extremely dangerous for the environment,” 5 = “not dangerous at all for the environment;” *M* = 3.83, *SD* = .96).

**Independent Variables**

**Primary sources of science news**. Respondents reported their primary sources of science news by answering the question “which source do you get most of your information about science and technology from?” The question was accompanied with nine options, ranging from newspapers, magazines to TV, radio and the Internet, family/friends etc. For those who chose newspapers and magazines, they were further asked to indicate whether they mostly used online or printed newspaper and magazines. People who chose the Internet also reported the specific sources, such as search engines, blogs, Wikipedia etc. We compiled respondents’ answers to these questions and created a categorical variable measuring their primary sources of science news: 33.8% used printed media, including newspapers and magazines, 31.1% used TV and 35.2% used the Internet, excluding the online versions of newspapers and magazines.

**Scientific optimism.** This variable was measured by five items asking respondents to indicate their agreement or disagreement with the following statements: “Because of science and technology, there will be more opportunities for the next generation;” “Even if it brings no immediate benefits, scientific research that advances the frontiers of knowledge is necessary and should be supported by the government;” “Scientific researchers are dedicated people who work for the good of humanity;” “Most scientists want to work on things that will life better for the average person;” “Scientists are helping to solve challenging problems;” on a four-point scale (1 = “strongly agree,” 4 = “strongly disagree”). The five items were then averaged to form an index measuring respondents’ optimistic attitudes toward science (Cronbach’s alpha = .75, *M* = 3.18, *SD* = .43).

**Environmental concerns.** Four items on respondents’ general concerns about environmental issues and governmental spending were used to form an index for this variable (Cronbach’s alpha = .70, *M* = 2.84, *SD* = .61). First, respondents reported how interested they are in issues about environmental pollution (1 = “very interested,” 3 = “not at all interested.”) Respondents were then asked whether “we’re spending too much money on it, too little money, or about the right amount on improving and protecting the environment” and whether they “would like to see more or less government spending in the environment.” In addition, respondents indicated whether they “think it should or should not be the government’s responsibility to impose strict laws to make industry do less damage to the environment.”

**Political leaning.** Two items on party identification and political ideology were standardize and combined to measure one’s political leaning (Pearson’s r = .49, *M* = 0, *SD* = .87). Party identification was measured on a seven-point scale (1 = “strong Democrat,” 4 = “Independent,” 7 = “strong Republican). Political ideology was measured by a seven-point scale (1 = “extremely liberal,” 4 = “moderate,” 7 = “extremely conservative”).

**Demographics.** Collected demographics included gender (44.5% males), age (M = 49, SD = 17.7), education (62.6% High School or less, 7.6% some college, 29.8% college and more). A dummy variable was used to indicate whether respondents had ever taken any college-level science courses (41.4% yes). Respondents also reported the extent to which respondents consider themselves as a religious person (1 = “very religious,” 4 = “not religious at all”) (*M* = 2.49, *SD* = 1.01).

**Analytical Framework**

A hierarchical ordinary least squares (OLS) regression model was fitted to investigate the effects of demographics, predispositions, and science news sources on risk perceptions of pesticides. The independent variables were entered based on their assumed causal order. To examine the effect of selective exposure, we included a series of interaction terms capturing how the relationship between scientific optimism/environmental concerns and risk perception varies for active users of printed news, TV news, and online-only news.

**Results**

Overall, the model accounts for 14.3% of the variance in the dependent variable. Females are more concerned about pesticide risks than males ( = .17, p = 0). Scientific optimism is natively related to ( = -.13, p = .02) while environmental concern is positively related to ( = .31, p = 0) the dependent variable. In other words, people who are less optimistic about scientific advances and those who are more concerned about environmental quality tend to perceive more risks associated with agricultural pesticide use. In addition, people who rely on online-only media as their primary sources of science news perceive pesticides to be riskier than those primarily use television news (see Figure 1). The mean difference between printed media and television as well as that between online-only media and printed media are not significant.



Figure 1. Primary sources of science news and risk perception of pesticide uses.

In addition, the relationship between scientific optimism and pesticide risk perception varies for people who rely on different media platforms as the primary sources of science news. Specifically, while scientific optimism is positively related to risk perception for printed news users, it is negatively related to the dependent variable for online-only news users (see Figure 2). In other words, the negative relationship between scientific optimism and risk perception detected earlier only exists for active users of online news.



Figure 2. Interactive effects of scientific optimism and primary sources of science news on risk perception of pesticides.

**Conclusions**

Mass media have played a critical role in constructing and transmitting risks in society. Especially for chronic environmental risks that many people have seldom experienced, mass media have provided essential informational shortcuts to form opinions and perceptions. With respect to the agricultural use of pesticides, science news on the Internet has instilled a higher level of risk perception in audience members than TV science news, which might be due to the different ways in which environmental risks are covered on both types of media. For instance, while online-only outlets, such as blogs and digital magazines, often feature emotionally charged contents that focus on motivating collective actions, television tends to highlight laypersons’ perspectives on potential or actual hazards. In addition, our results show that active users of online science news are likely to select information that aligns with their preexisting attitudes, such as scientific optimism, and hence to attenuate their risk perception of pesticide uses. However, such selective tendency does not apply to those who rely on printed media and television as their primary sources of science information. This finding has furthered our understanding of the different roles of printed, broadcast and online-only media in communicating chronic environmental risks involved in pesticide use. Although previous studies have characterized mass media as an amplifier of environmental risk, this function might be varying as the whole media landscape has become increasingly fragmented. Future studies should develop a more coherent framework explaining the role of mass media in communicating risks under different circumstances and develop risk communication strategies that tailor to individuals’ news use behaviors.

**References**

Aktar, M. W., Sengupta, D., & Chowdhury, A. (2009). Impact of pesticides use in agriculture: Their benefits and hazards. *Interdisciplinary Toxicology*, *2*(1), 1–12. http://doi.org/10.2478/v10102-009-0001-7

Allan, S., Adam, B., & Carter, C. (2000). *Environmental Risks and the Media*. Routledge.

Brossard, D. (2013). New media landscapes and the science information consumer. *Proceedings of the National Academy of Sciences of the United States of America*, *110 Suppl*, 14096–101. http://doi.org/10.1073/pnas.1212744110

Cottle, S. (2000). TV news, lay voices and the visualization of environmental news. In S. Allan, B. Adam, & C. Carter (Eds.), *Environmental Risks and the Media* (pp. 29–44). Routledge.

Crosbyl, D. G. (1973). The fate of pesticides in the environment. *Annual Review of Plant Physiology*, (24), 467–492.

Damalas, C. (2009). Understanding benefits and risks of pesticide use. *Scientific Research and Essay*, *4*(10), 945–949.

Dudo, A., Dunwoody, S., & Scheufele, D. A. (2011). The emergence of nano news: Tracking thematic trends and changes in U.S. newspaper coverage of nanotechnology. *Journalism & Mass Communication Quarterly*, *88*(1), 55–75.

Fenner, K., Canonica, S., Wackett, L. P., & Elsner, M. (2013). Evaluating pesticide degradation in the environment: Blind spots and emerging opportunities. *Science*, *341*(6147), 752–758. http://doi.org/10.1126/science.1236281

Freudenburg, W. R., Coleman, C.-L., Gonzales, J., & Helgeland, C. (1996). Media coverage of hazard events: Analyzing the assumptions. *Risk Analysis*, *16*(1), 31–42. http://doi.org/10.1111/j.1539-6924.1996.tb01434.x

Friedman, S. M. (2011). Three Mile Island, Chernobyl, and Fukushima: An analysis of traditional and new media coverage of nuclear accidents and radiation. *Bulletin of the Atomic Scientists*, *67*(5), 55–65. http://doi.org/10.1177/0096340211421587

Kasperson, R., Renn, O., Slovic, P., Brown, H., Emel, J., Goble, R.,… Ratick, S. (1988). The social amplification of risk-a conceptual framework. *Society for Risk Analysis*, *8*(2), 177–187.

Krimsky, S. (2007). Risk communication in the internet age: The rise of disorganized skepticism. *Environmental Hazards*, *7*(2), 157–164. http://doi.org/10.1016/j.envhaz.2007.05.006

Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, *108*(3), 480–498. http://doi.org/10.1037/0033-2909.108.3.480

Nisbet, M. C., & Markowitz, E. M. (2016). *Americans’ attitudes about science and technology: The social context for public communication*.

Slater, M. D., & Rasinski, K. A. (2005). Media Exposure and Attention as Mediating Variables Influencing Social Risk Judgments. *Journal of Communication*, *55*(4), 810–827. http://doi.org/10.1111/j.1460-2466.2005.tb03024.x

USGS. (2014). *Pesticide trends in major rivers of the United States, scientific investigations report 2014 – 5135*. http://doi.org/10.3133/sir20145135

Wachinger, G., Renn, O., Begg, C., & Kuhlicke, C. (2013). The risk perception paradox-implications for governance and communication of natural hazards. *Risk Analysis*, *33*(6), 1049–1065. http://doi.org/10.1111/j.1539-6924.2012.01942.x

**Exploring Analytical Approaches for Understanding Students’ Motivations to Study Abroad**

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**Abstract**

*In this study, researchers developed and validated a 16-item instrument (Study Abroad Motivation Instrument; SAMI) to assess students’ perceptions of relative cost. The scale is based on the Expectancy-Value-Cost (EVC) model, which focuses on the component of cost in Eccles’ et al.’s general expectancy-value theory of achievement motivation (EVT). The scale was administered to 219 students. The items were subjected to principal axis factoring to assess dimensionality of the data. Four factors were extracted explaining 74% of the variance: outside effort cost (four items), emotional cost (three items), task effort cost (five items), and loss of valued alternatives cost (four items). Each of the factors were found to be reliable (α ≥ .70). A simple logistic regression analysis predicted overall motivation to study abroad for the students in the sample, using sub-domains of relative cost as predictor variables. A test of the full model against a constant only model was statistically significant, indicating the predictor as a set reliably distinguished between motivated and unmotivated students. The Wald criterion demonstrated that only outside effort cost made a significant contribution to prediction. Prediction success overall was 73.5% (56.8% for unmotivated and 83.3% for motivated), further evidencing validity of the scale.*

**Introduction**

Study abroad programs are popular options for providing students with experiences that facilitate notions of intercultural understanding, global competence, and opportunities to explore complex issues of identity, power, privilege, and culture (Doerr, 2013). This phenomenon includes students studying in the agricultural and related sciences and preparing for careers likely to involve intercultural and international interactions. However, conceptualizing intercultural/global competency is complicated (Deardorff, 2011; Doerr, 2013), and not all students have the means or desire to study abroad. To this end, recent motivation research has focused on the forgotten *relative cost* component of Eccles’ et al. (1983) general expectancy-value theory of achievement motivation (EVT).

Retrospective appraisals of past failures, which include notions of intercultural understanding, global competence, and international experiences, are most likely influenced or related to the relative costs (outside effort cost, loss of valued alternatives cost, emotional cost, and task effort cost) of future participation in short-term study abroad courses or experiences (STSACE). Although other studies have investigated students’ real-time and retrospective motivations for participating in STSACEs, few have studied how perceptions of relative cost, including recent advances in motivation research, influences why students choose to participate. Therefore, to better understand students’ conceptualizations of relative cost, we believe the need exists to develop and validate a motivation instrument based on the Expectancy-Value-Cost (EVC) model. We present validity evidence for a scale used to understand perceived costs of agricultural students for enrolling in STSACEs prior to graduating.

**Theoretical Framework**

The Expectancy-Value-Cost (EVC) model has emerged as a sound theoretical framework focused on the relative cost component proposed in Expectancy-Value-Theory [EVT] (Barron & Hulleman, 2015). According to the EVC model, cost is theoretically distinct and should be differentiated from other components within the EVT model, such as *expectancies for success* and *subjective task-values* (Flake, Barron, Hulleman, McCoach, & Welsh, 2015). Previous research into relative cost found strong associations between lower-order cost constructs and agricultural students’ motivations to study abroad prior to being graduated. Raczkoski, Robinson, Edwards, and Baker (2016) concluded that relative cost influences college students’ motivations for enrolling in STSACEs prior to graduating. We propose the following model depicting the lower-order cost constructs and their relationships to relative cost and students’ motivations to study abroad (see Figure 1).

*Figure 1*. Conceptual model for the EVC model and students’ motivations to study abroad.

**Objectives**

This study’s purpose was to validate an instrument used to assess Oklahoma State University agricultural students’ conceptualizations of relative cost in the context of STSACEs. Four objectives were used to guide this inquiry:

1. Examine the fit of a four-factor EVC model in the context of STSACEs;
2. Estimate the lower order factor reliabilities and evaluate their adequacy (i.e., α > .70);
3. Calculate the correlations between the four latent EVC sub-factors, relative cost, and overall motivation to study abroad; and
4. Determine the association between relative cost and overall motivation to study abroad.

**Methods/Procedures**

For this study, 16 items were presented in random order, online using Qualtrics Survey Software, with a 5-point summated scale: 1 = *Completely disagree*, 3 = *Neither agree nor disagree*, and 5 = *Completely agree*. Cost items were negatively worded on the questionnaire and reverse coded for analysis. The sample included 219 students, 70.3% female (0.9% did not indicate gender) with an average age of 21.5 (*SD* = 5.4, 6.4% did not indicate age). Participants reported themselves to be White (73.5%), Native American/Alaskan Native (12.8%), International (9.1%), Black (5.5%), Hispanic (5.0%), and Asian American (2.3%).

This investigation began with an exploratory factor analysis (EFA) for the 16 items using principal axis factoring (PAF). PAF was used because the data violated the assumption of multivariate normality based on the Shapiro-Wilk test (*p* < .05). All items in the correlation matrix were moderately correlated (.10 > *r* > .90). The determinant for the correlation matrix was 7.853E-006, which indicated no multicollinearity and EFA of the dataset was feasible. The Kaiser-Meyer-Olkin Test of Sampling Adequacy (KMO) was .916, indicating the sample was large enough for EFA. Bartlett’s Test of Sphericity tested the null hypothesis that the correlation matrix was an identity matrix (*p* < .0001). To gain a clearer understanding of the underlying factor structure, a Promax rotation was used because in social sciences we can generally expect correlation among factors (Costello & Osborne, 2005).

The factor loadings presented in the pattern matrix were used to determine which items to retain or remove from subsequent analyses. We considered factors with fewer than three factor loadings (≤ .50) to be weak or unstable. The sample size used in this study exceeded the recommend item ratio of 10:1 for an instrument with 16 items. We established internal reliability using post-hoc Cronbach’s alpha coefficients, and Pearson’s correlations to estimate relationships between the variables, based on conventions proposed by Davis (1971). Items were closely examined both conceptually and theoretically to determine their suitability and interpretability for inclusion within the underlying factor structure (Beavers et al., 2013; Fabrigar et al., 1999). Researchers used logistic regression to determine the association between overall motivation to study abroad and sub-domains of relative cost. Two predictor values were tested, i.e. students will be motivated to study abroad, or they will not be motivated to study abroad. First, the logistic regression predicted group membership. Second, the logistic regression provided the relationship among relative cost variables, including outside effort cost, loss of valued alternatives cost, task effort cost, and emotional cost.

**Results/Findings**

Sixteen cost items were subjected to principal axis factoring to assess dimensionality of the data. Four factors were extracted explaining 74% of the variance. This was decided based on the extraction criteria used. Factors were obliquely rotated using Promax rotation: outside effort cost (51.7%), emotional and task effort cost (11.4%), emotional cost (6.0%), and loss of valued alternatives cost (5.3%). *Outside effort cost* consisted of four items, which represented negative appraisals of the amount of time and effort put forth for tasks other than STSACEs. For example, students not having enough time to study abroad because of other activities, other demands on time, too many responsibilities, and other commitments. *Task effort cost* and *emotional cost* consisted of five items, two of which represented if students perceived STSACEs would be too exhausting and too frustrating and three items addressed the belief that studying abroad would be too much work, demand too much energy, and demand too much time. *Emotional cost* consisted of three items, which included negative appraisals of a psychological state resulting from exerting effort for STSACEs. For instance, students experiencing a psychological state characterized by worrying too much, being too anxious, and feeling too stressed about studying abroad. *Loss of valued alternatives cost* consisted of four items, which included negative appraisals of giving up other valued activities, missing out on too many things, sacrificing too much, and spending less time on other valued activities because of their participation in a STSACE (see Table 1).

Table 1

*Pattern Matrix from Hypothesized EFA Solution*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item | Outside Effort Cost |  | Task  Effort Cost |  | Emotional Cost |  | LOVA |
|  |  |  |  |  |  |  |  |
| OE3 | 1.010 |  |  |  |  |  |  |
| OE1 | .839 |  |  |  |  |  |  |
| OE2 | .692 |  |  |  |  |  |  |
| OE4 | .669 |  |  |  |  |  |  |
| EM5 |  |  | .863 |  |  |  |  |
| TE3 |  |  | .838 |  |  |  |  |
| EM1 |  |  | .629 |  |  |  |  |
| TE2 |  |  | .545 |  |  |  |  |
| TE1 |  |  | .494 |  |  |  |  |
| EM4 |  |  |  |  | .910 |  |  |
| EM2 |  |  |  |  | .796 |  |  |
| EM3 |  |  |  |  | .588 |  |  |
| L1 |  |  |  |  |  |  | .840 |
| L2 |  |  |  |  |  |  | .780 |
| L3 |  |  |  |  |  |  | .578 |
| L4 |  |  |  |  |  |  | .482 |
|  |  |  |  |  |  |  |  |

*Note*. Factor loadings < .32 were suppressed. L = Loss of Valued Alternatives; OE = Outside Effort Cost; EM = Emotional Cost; TE = Task Effort Cost. Principal Axis Factoring w/Promax Rotation and 74% variance explained. Scale: 1 = *Strongly disagree*;3 = *Neither agree nor disagree*;5 = *Strongly agree*.

Reliability coefficients were computed using Cronbach’s alpha scores (*N ­*= 219). The four factors had reliability coefficients greater than .70 (Nunnally, 1978). Reliability estimates for each factor were: outside effort cost = .89 (four items); emotional and task effort cost = .86 (five items); emotional cost = .85 (three items); and loss of valued alternatives cost = .86 (four items). In addition, the final cost scale was used to create an observed mean score for all 16 items. The sub-dimensions, i.e., task effort cost, outside effort cost, loss of valued alternatives and emotional cost, were used to calculate an observed sub-scale mean for each item, and an observed mean score was calculated for student’s overall motivation to study abroad, e.g., I will be motivated to enroll in a credit-bearing, short-term study abroad course or experience prior to graduation. The correlation coefficient revealed the relationships among relative cost, sub-dimensions of cost, and overall motivation to study abroad (see Table 2).

Table 2

*Correlation Coefficients among Cost, Sub-Dimensions of Cost, and Overall Motivation to Study Abroad*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-factor |  | 1 |  | 2 |  | 3 |  | 4 |  | 5 |  | 6 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cost |  | - |  |  |  |  |  |  |  |  |  |  |
| Outside Effort Cost |  | .853\* |  | - |  |  |  |  |  |  |  |  |
| Task Effort Costa |  | .869\* |  | .595\* |  | - |  |  |  |  |  |  |
| Emotional Cost |  | .710\* |  | .448\* |  | .646\* |  | - |  |  |  |  |
| LOVAb |  | .880\* |  | .708\* |  | .687\* |  | .558\* |  | - |  |  |
| Overall motivation |  | .510\* |  | .504\* |  | .381\* |  | .320\* |  | .452\* |  | - |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Note.* Magnitude: .01 ≥ *r* ≥ .09 = Negligible, .10 ≥ *r* ≥ .29 = Low, .30 ≥ *r* ≥ .49 = Moderate, .50 ≥ *r* ≥ .69 = Substantial, *r* ≥ .70 = Very Strong (Davis, 1971). \**p* < .01; \*\**p* < .05. *N* = 219. aTask Effort Cost = includes three emotional cost items. bLOVA = Loss of Valued Alternatives | | | | | | | | | | | | |

A logistic regression analysis was conducted to predict overall motivation to study abroad for 219 agriculture students, using sub-domains of relative cost as predictors. A test of the full model against a constant only model was statistically significant, indicating the predictor as a set reliably distinguished between unmotivated and motivated students (chi-square = 67.23, *p* < .001 with *df* = 4. Nagelkerke’s of .361 indicated a moderately strong relationship between prediction and grouping. Prediction success overall was 73.5% (56.8% for unmotivated and 83.3% for motivated). The Wald criterion demonstrated that *outside effort cost* made a significant contribution to prediction (*p* = .000). Task effort cost and emotional cost, loss of valued alternatives cost, and emotional cost were not significant predictors. Exp (B) values indicated that when outside effort cost is raised by one unit (agreeableness) the odds ratio is 2.34 times as large and, therefore, students were 2.34 times more likely to be motivated to study abroad.

**Conclusions/Recommendations/Implications**

There were four conclusions from the results of this study. First, four factors explained 74% of the variance in agricultural students’ motivations to study abroad. Second, reliability of the scale was established (α > .70). Third, sub-constructs of cost were moderately and substantially correlated to students overall motivation to study abroad. Finally, *outside effort cost* is useful for predicting the probability of whether a student is sufficiently motivated to study abroad, which previously has never been included in other motivation scales. Students’ results on this scale can be used by course instructors, including agricultural education, and coordinators/directors of international programs as a tool when planning, promoting, and recruiting students for STSACEs. The tool can help create programs and shape advising efforts in two ways: 1) develop targeted interventions to help students overcome perceived cost barriers so more students study abroad and 2) to identify agricultural students who want to study abroad early in their college career (for example, in freshman orientation), so they can connect with faculty and begin preparing for a STSACE. Future studies are recommended to determine how various student demographics/characteristics (ethnicity, age, financial status, major/college, etc.) may be related to scores on the scale, which will further help us understand the perceived costs related to STSACEs.

**References**

Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research & Evaluation*, *18*(6), 1–13. Retrieved from http://www.pareonline.net/getvn.asp?v=18&n=6

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation, 10*, 1–9. Retrieved from http://pareonline.net/getvn.asp

Deardorff, D.K. (2011). Assessing intercultural competence. In J.D. Penn (Ed.), *Assessing complex general education student learning outcomes*,65–79. San Francisco: Jossey-Bass.

Doerr, N.M. (2013). Do ‘global citizens’ need the parochial cultural other? Discourse of immersion in study abroad and learning-by-doing. *Compare: A Journal of Comparative and International Education, 43*(2), 224–243. doi:10.1080/03057925.2012.701852

Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., & Meece, J. (1983). Expectancies, values and academic behaviors. In J. T. Spence (Ed.), *Achievement and Achievement Motives*, 75–146. San Francisco, CA: W. H. Freeman.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272. doi:10.1037/1082-989X.4.3.272

Flake, J. K., Barron, K. E., Hulleman, C., McCoach, B. D., & Welsh, M. E. (2015). Measuring cost: The forgotten component of expectancy-value theory. *Contemporary Educational Psychology*, *41*, 232–244. doi:10.1016/j.cedpsych.2015.03.002

Raczkoski, B. M., Robinson, J. S., Edwards, M. C., & Baker, M. A. (2016). Agricultural students’ affective perceptions of cost, expectancy, and value in the context of short-term study abroad courses: Applying expectancy-value-cost models. *2017 AAAE Southern Region Research Conference Proceedings*, 332–347. Retrieved from http://aaaeonline.org/resources/Documents/Southern%20Region/2017%20AAAE%20Southern%20Region%20Conference%20Proceedings.pdf

**Does It Take a Village? – An Examination of the Experiential Roles Played by Educators in Supporting Agriscience Fair Participants in Oklahoma**

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**Abstract**

*This survey design study sought to describe what collaboration exists as students prepare an agriscience fair project in Oklahoma, and to determine what experiential educator roles are played by various collaborators. A census approach was utilized drawing from a population of 201 secondary based agricultural education students that participated in the Oklahoma FFA Agriscience Fair, of which 93% response was achieved. The Kolb Eduator Role Profile (KERP), grounded in Kolb’s (2015) Experiential Learning Theory (ELT), framed this study. It was concluded that agrscience fair participants look to an average of 3.65 collaborators to fill the educator roles, the agricultural educator plays the largest role, and a number of outside collaborators such as parents, industry professionals and core teachers also serve key educator roles. It is recommended that secondary educators continue to support projects such as the agriscience fair to enhance all four roles of experiential learning and look to non-traditional educators to support student development.*

**Introduction**

The call by legislators, administrators, and industry stakeholders to integrate academic curriculum in to career and technical education, or CTE, is clear (Washburn & Myers, 2010). Research indicates that integration is not only possible, but is desirable, as an integrated curriculum develops student understanding of content by providing various disciplines as conceptual contexts (Conroy & Walker, 2000). Agricultural education and academic content are naturally connected as indicated by Stubbs and Myers, “Agriculture provides meaningful context for hands-on, object-based, and other experiential learning that connects traditional academic subjects” (2016).

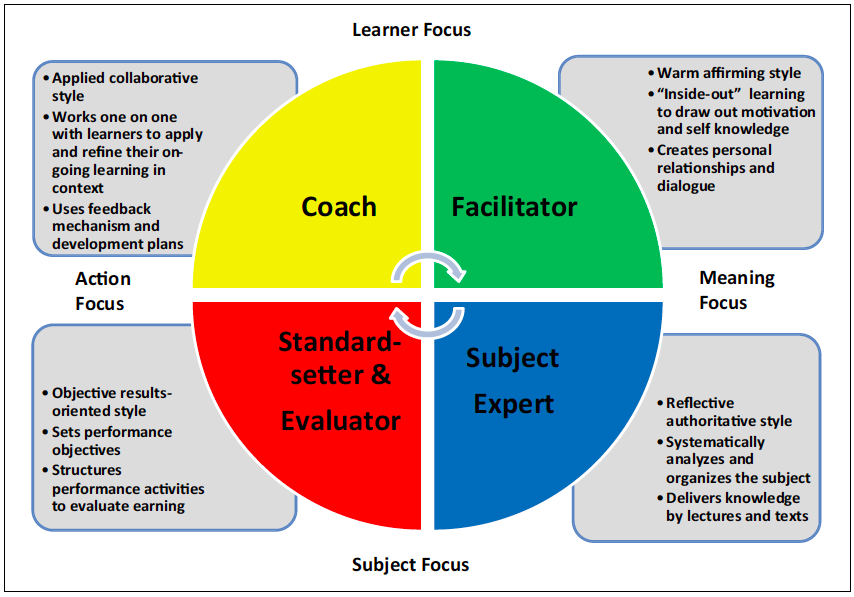
Research shows that barriers to science, technology, engineering, and math (STEM) integration are many (Myers & Washburn, 2008; Thompson & Balschweid, 1998; Myers, Thoron, & Thompson, 2009; Roberts & Ball, 2009; Warnick & Thompson, 2007). The most significant barriers to content integration are commonly thought to be lack of time, materials, and funding (Myers & Washburn, 2008; Thompson & Balschweid, 1998). However, one less intuitive barrier to integration is teacher confidence and preparedness in successfully delivering an integrated curriculum (Smith, Rayfield, & McKim, 2015; Warnick & Thompson, 2007; Conroy & Walker, 2000). Though the need for STEM and Language Arts integration into agriculture education is clear, Conroy and Walker (2000) found that agriculture educators may simply lack the academic background to be able to teach core subjects to the depth students need. Furthermore, Baker and Twenter (2016) found that agricultural educators in Oklahoma have a strong preference for the coaching role and little preference for the role of expert.

One of the most common solutions to overcoming these barriers is collaboration (Roberts & Ball, 2009; Warnick & Thompson, 2007; Parr, Edwards, & Leising, 2009; NRCCTE, 2010; Thompson & Balschweid, 1998). Collaboration between agriculture educators and core content teachers, community members, and industry representatives occurs, but is not found to be extensive or continuous (Osborne & Dyer, 1998), even though a lack of confidence in teaching academic content in agricultural education decreases after collaborative efforts (NRCCTE, 2010). Seeking opportunities for collaborative relationships with academic educators and community members are recommended to focus on materials and resources (Myers & Washburn, 2008) and better balanced delivery of the four essential experiential roles to be played (Baker & Twenter, 2016). Collaborative efforts to build agriculture and academic teacher efficacy in content integration and base of technical knowledge are effective, especially when encouraged by administration (Parr, Edwards, & Leising, 2009; Warnick & Thompson, 2009). Many recommendations have been made specific to agriculture educators, namely that agriculture teachers should work to build relationships with other teachers and those in their community. Initiation of a collaborative relationship is apparent and necessary to build a connection for a purpose (Carraway, Ulmer, Burris, & Irlbeck, 2016).

Independent projects and the project-based method of teaching have returned with the increased focus on learner-centered education (Smith & Rayfield, 2016). Using project based learning strategies, teachers may answer the call of heightened integration of core concepts into agriculture education as project based learning may serve as “an application of concepts in agriculture education courses, and as the vehicle through which people learn” (Smith & Rayfield, 2016). One manifestation of project-based learning that has long been adopted for the science classroom is the science fair. Schools and teachers may integrate the competitive core of the science fair into the classroom to encourage learning and engage students with real-world STEM issues (Dionne, et al., 2011). Science fairs motivate student learning through student interest and recognition, and as one study shares, “the contextualization, the activities that promote challenging, exciting scientific contents, the process of social construction of the knowledge in science class, as well as the inquiry-based learning may serve as motivators and tools for better science teaching” (Dionne, et al., 2011). Much of the responsibility for the accumulation of resources for the student lies in the dedication and willingness of the teacher sponsor to facilitate student engagement and relationships with the community (Gifford & Wiygul, 1992). The mission of the National FFA Agriscience Fair is to “recognize student researchers studying the application of agricultural scientific principles and emerging technologies in agricultural enterprises” (National FFA, 2016). An effective project incorporates skills that link career readiness and academic preparation together such as data analysis and reporting, identifying research objectives, and understanding the scientific process. Keys to success include the investigation of a relevant issue, teacher supervision, and collaboration between “student researchers, teachers, and specialists in the field of study” (National FFA, 2016).

**Conceptual and Theoretical Framework**

Experiential Learning Theory (Kolb, 2015) describes learning as “a dynamic view of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction (p.50). This four mode learning cycle grounded in student experience provides a theoretical frame for this study. The Kolb Educator Role Profile (Kolb, Kolb, Passarelli, & Sharma, 2014; KERP) is an extension of the ELT and makes transparent the role of educators in assisting learners in completing experiential cycles leading to development. Figure 1 visually depicts the four roles and provides brief elements of each. The conceptual framework of the KERP is the primary interest of this study.



*Figure 1.* Educator Role Profile. Adapted from “On Becoming an Experiential Educator: The Educator Role Profile” by A. Kolb, D. Kolb, A Passarelli, and G. Sharma, 2014, *Simulation and Gaming, 45*(2), p. 220. Copyright 2014 by SAGE Publications.

**Purpose and Objectives**

The purpose of this study is to describe what collaboration exists as students prepare an agriscience fair project in Oklahoma, and to determine what experiential educator roles are played by various collaborators. Three research questions guided this study:

1. How many collaborators support each student participating in the Oklahoma Agriscience Fair?
2. What was the extent of collaboration by each educator or stakeholder?
3. What experiential educator roles do collaborators and educators play?

**Methodology**

This descriptive, survey design, study utilized a population of 201 secondary based agricultural education students participating in the Oklahoma FFA Agriscience Fair. A census approach was utilized due to the small population size as recommended by Krejcie and Morgan (1970). Of the population, 186 students responded consistently for a response rate of 93% of the population. The instrument was researcher developed and was embedded in an evaluative questionnaire that is utilized for program purposes. Students were asked three questions related to the research questions. Unique responses related to collaborator type were allowed and then coded to allow a broad range of collaborators to be identified. Face and content validity was established through a panel of experts including secondary students and those associated with the agriscience fair. Data was collected on the day of the Oklahoma FFA Agriscience Fair directly following each students judging session at an optional feedback station. Internal Review Board approval was received to de-identify the archival evaluative data. Data was found to be normal through a visual analysis of normality curves and P-P plots (Field, 2009). Simple descriptive statistics were used to describe the population congruent with censuse conventions (Creswell, 2008).

**Results/Findings**

Table 1

*Summary of Mean Student Reported Percentages of Assistance Played by Various Collaborators in Support of an Agriscience Student Project.*

|  |  |  |
| --- | --- | --- |
| Collaborator | *M\** | *SD* |
| Agricultural Educator | 47.68 | *27.42* |
| Parent and/or Guardian | *17.65* | *21.02* |
| Science Teacher | *12.42* | *21.65* |
| Agriculture Industry Professional | *5.02* | *11.06* |
| English Teacher | *4.22* | *10.66* |
| Peer/Classmate/Friend | *3.57* | *10.54* |
| Professor at Local University | *3.45* | *12.01* |
| Sibling | *.98* | *5.13* |
| Agriscientist | *.83* | *5.40* |
| Grandparent | *.38* | *2.7* |

\*Note: Each mean represents the percentage of assistance provided by each collaborator.

Table 2

*Summery of Frequencies and Percentages of Collaborators Serving Each of the Four Experiential Educator Roles*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Facilitator | | Expert | | Evaluator | | Coach | |
| Collaborator | *f* | *%* | *f* | *%* | *f* | *%* | *f* | *%* |
| Agricultural Educator | 133 | 78.2 | 90 | 51.1 | 99 | 63.9 | 109 | 70.3 |
| Parent and/or Guardian | 17 | 10.0 | 14 | 8.0 | 16 | 10.3 | 28 | 18.1 |
| Core Teacher | 4 | 2.4 | 11 | 6.3 | 16 | 8.0 | 6 | 3.9 |
| Agriculture Industry Professional | 6 | 3.5 | 30 | 17.0 | 14 | 9.0 | 2 | 1.3 |
| Peer/Classmate/Friend | 4 | 2.4 | 1 | 0.5 | 5 | 3.2 | 3 | 1.9 |
| Professor at Local University | 3 | 1.8 | 11 | 6.3 | 2 | 1.3 | 2 | 1.3 |
| Self (Student) | 0 | 0.0 | 2 | 1.1 | 0 | 0.0 | 0 | 0.0 |
| Sibling | 0 | 0.0 | 1 | .5 | 0 | 0.0 | 0 | 0.0 |
| Agriscientist | 2 | 1.2 | 12 | 6.8 | 3 | 1.9 | 5 | 3.2 |
| Other Elective Teacher | 0 | 0.0 | 2 | 1.1 | 0 | 0.0 | 0 | 0.0 |
| Grandparent | 1 | 0.6 | 2 | 1.1 | 0 | 0.0 | 0 | 0.0 |

Addressing the first research question, the average number of collaborators assisting each agriscience fair student, including the agricultural educator, was 3.65 (*SD = 3.35).* Research question two is addressed in Table 1, where students reported that ten unique collaborators assisted them, and of those the agricultural educator, parent, and science teachers played the largest roles in assisting and guiding their agriscience fair experience.

When students were asked to identify the primary collaborator associated with each experiential educator role, they identified the agricultural educator as the primary collaborator in all four roles. A large percentage of students noted an industry professional as the primary expert. Parents and core teachers were critical to the evaluative role. Findings are presented in Table 2.

**Conclusions/Recommendations/Implications**

The Oklahoma FFA Agriscience Fair is a learning experience that brings a number of collaborators to the table in order to complete the full experiential learning cycle. It has been noted that building purposeful partnerships is essential to properly supporting students in experiential learning (Carraway & Ulmer, 2016). The agriscience fair, an iteration of an independent project as suggested by Smith and Rayfield (2016), seems to be effectively pulling in a myriad of partners. Furthermore, students are recognizing that those partnership serve specific roles necessary for deep learning. It appears most often students are seeking experts and evaluators to assist in developing a high quality project. Perhaps this village building could be more purposefully developed as partners are created to serve very specific experiential educator roles. Research exploring other experiences in agricultural education would help understand if this phenomena is unique to the agriscience fair.

Collaboration extends far beyond core teachers within the students school district. Though much of the literature focuses on content integration and core teacher collaboration, a myriad of unexpected partners arose in this study. Parents, grandparents, industry professionals, other extracurricular teachers, professors, and friends of the students were also involved. The social construction of STEM knowledge through independent science exploration, as described by Dionne, et al. (2011), seems to be catalyzing the organic building of an educator village. Though this is encouraging, I do wonder if this strategy is serving only those desiring to win this simulated competition. Is this type of independent village building occurring throughout the program. This study did focus only on those attending this competitive event at the state level. How can this collaborative culture be cultivated in regular day-to-day classroom settings?

Finally, students relied heavily on their agricultural educator to serve all four roles, but they do seek out specific mentors to fill certain experiential educator roles. Agricultural educators and parents play predominant facilitator and coach roles. What does this mean for those without parental support and/or guidance? The expert and evaluator roles also involved agricultural educators and parents, but included agriculture industry professionals and core teachers as key educators. Gifford and Wiygul (1992) suggest that the agricultural educator must facilitate these partnerships. Have we prepared pre-service teachers to build and facilitate this type of mentorship? Research assessing pre-service and in-service teacher confidence in this area is warranted.

**References**

Baker, M. A., & Twenter, J. P. (2016). An exploratory examination of the Kolb experiential educator role profile. *Proceedings of the American Association for Agricultural Education Annual National Research Conference, USA, 43,* 177-191. Retrieved from http://aaaeonline.org/resources/Documents/National/2016AAAE%20Proceedings%20Final.pdf

Carraway, C., Ulmer, J., Burris, S., & Irlbeck, E. (2016). Exploring science teachers’ perceptions of the Curriculum for Agricultural Science Education. *Proceedings of the American Association for Agricultural Education Annual National Research Conference, USA, 43,* 223-237. Retrieved from http://aaaeonline.org/resources/Documents/National/2016AAAE%20Proceedings%20Final.pdf

Conroy, C. A., & Walker, N. J. (2000). An examination of integration of academic and vocational subject matter in the aquaculture classroom. *Journal of Agricultural Education, 41*(2), 54-64. doi:10.5032/jae.2000.02054

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Boston, MA: Pearson Education, Inc.

Dionne, L., Reis, G., Trudel, L., Guillet, G., Kleine, L., & Hancianu, C. (2012). Students’ sources of motivation for participating in science fairs: An exploratory study within the Canada-wide science fair 2008. *International Journal of Science and Mathematics Education, 10*(3)*,* 669-693. doi:10.1007/s10763-011-9318-8

Field, A. (2009). *Discovering statistics using SPSS (3rd ed.)*. Thousand Oaks, CA: Sage Publications, Inc.

Gifford, V. D., & Wiygul, S. M. (1992). The effect of the use of outside facilities and resources on success in secondary school science fairs. *School Science and Mathematics, 92*(3), 116-119. doi:10.1111/j.1949-8594.1992.tb12155.x

Kolb, A. Y., Kolb, D. A., Passarelli, A., & Sharma, G. (2014). On becoming an experiential educator: The educator role profile. *Simulation & Gaming, 45*(2), 204-234. doi:10.1177/1046878114534383

Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development.* Upper Saddle River, NJ: Pearson Education, Inc.

Krejcie, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*, 607 – 610.

Myers, B. E., Thoron, A. C., & Thompson, G. W. (2009). Perceptions of the National Agriscience Teacher Ambassador Academy toward integrating science into school-based agricultural education curriculum. *Journal of Agricultural Education, 50*(4), 120-133. Retrieved from http://files.eric.ed.gov/fulltext/EJ871230.pdf

Myers, B. E., & Washburn, S. G. (2008). Integrating science in the agriculture curriculum: Agriculture teacher perceptions of the opportunities, barriers, and impact on student enrollment. *Journal of Agricultural Education, 49*(2), 27-37. Retrieved from http://files.eric.ed.gov/fulltext/EJ839880.pdf

National FFA Organization. (2016). *Agriscience fair program 2017-2021.* Retrieved from https://www.ffa.org/SiteCollectionDocuments/asf\_2017\_2021\_agriscience\_fair\_handbook.pdf

NRCCTE Curriculum Integration Workgroup. (2010, March). *Capitalizing on context: Curriculum integration in career and technical education.* Louisville, KY: National Research Center for Career and Technical Education, University of Louisville. Retrieved from http://www.nrccte.org/resources/publications/capitalizing-context-curriculum-integration-career-and-technical-education-0

Osborne, E. W., & Dyer, J. E. (1998). Attitudes of Illinois high school science teachers toward educational programs in agriculture. *Journal of Agricultural Education, 39*(1), 8-16. doi:10.5032/jae.1998.01008

Parr, B. A., Edwards, M. C., & Leising, J. G. (2009) Selected effects of a curriculum integration intervention on the mathematics performance of secondary students enrolled in an agricultural power and technology course: An experimental study. *Journal of Agricultural Education, 50*(1), 57-69. doi:10.5032/jae.2009.01057

Roberts, T. G., & Ball, A. L. (2009). Secondary agricultural science as content and context for teaching. *Journal of Agricultural Education, 50*(1), 81-91. doi:10.5032/jae.2009.01081

Smith, K. L., & Rayfield, J. (2016). An early historical examination of the educational intent of supervised agricultural experiences (SAEs) and project-based learning in agricultural education. *Journal of Agricultural Education, 57*(2), 146-160. doi:10.5032/jae.2016.02146

Smith, K. L., Rayfield, J., & McKim, B. R. (2015). Effective practices in STEM integration: Describing teacher perceptions and instructional method use. *Journal of Agricultural Education, 56*(4), 182-201. doi:10.5032/jae.2015.04183

Stubbs, E. A., & Myers, B. E. (2016). Part of what we do: Teacher perceptions of STEM integration. *Journal of Agricultural Education, 57*(3), 87-100. doi:10.5032/jae.2016.030897

Thompson, G. W., & Balschweid, M. A. (1998, December). *Agriculture teachers’ perceptions of integrating science in Oregon agricultural science and technology programs.* Paper presented at the National Agricultural Education Research Meeting, New Orleans, Louisiana.

Warnick, B. K., & Thompson, G. W. (2007). Barriers, support, and collaboration: A comparison of science and agriculture teachers’ perceptions regarding integration of science into the agricultural education curriculum. *Journal of Agricultural Education, 48*(1), 75-85. doi:10.5032/jae.2007.01075

Washburn, S. G., & Myers, B. E. (2010). Agriculture teacher perceptions of preparation to integrate science and their current use of inquiry based learning. *Journal of Agricultural Education, 51*(1), 88-98. doi:10.5032/jae.2010.01088

**STEM Knowledge, Learning Disabilities and Experiential Learning: Influences of Sequencing Instruction**

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**Abstract**

*Career and technical education (CTE) courses, including agricultural education courses, are home to a disproportionately large number of students with learning disabilities (LD). Agricultural education has been sought as a potential solution to teaching abstract STEM concepts through experiential learning methods. Abstract concepts are noted in the literature as particularly difficult for students with learning disabilities to grasp. This study was designed to describe the changes in pretest and posttest scores on STEM content tests for students when accounting for their preference for grasping information through experiential learning theory and their learning disability classification. When instruction was sequenced to match student learning preference, change scores for students with learning disabilities were increased. When instruction was opposite student preference, students with learning disabilities had lower change scores than those without an LD classification Understanding the impact of differentiating instruction for STEM concepts when instructing students with learning disabilities in agricultural education courses could be aided by incorporating components related to individual sequencing of instruction to match student preference for grasping information through. Examining students through ELT may provide a platform for mitigating the effects of learning disabilities on student achievement.*

**Introduction / Theoretical Framework**

The ability to learn is a factor of student learning referred to in almost all models examining student achievement (Bender, 2007). As all students are individuals, each has an individual aptitude and capacity for bringing in, storing, and retaining information (Sousa, 2011). Accounting for individual learning ability in education is essential within an examination of how students learn. The very definition of learning disability (LD) lends itself to the importance of using learning disability status as a factor in understanding student achievement. Bender (2008) defined a learning disability as “a condition giving rise to difficulties in acquiring knowledge and skills to the level expected of those of the same age, especially when not associated with a physical handicap” (p. 18). Although there are large differences in the types of learning disabilities classified by federal legislation, researchers have found that collectively, students classified with a LD have lower test performance and GPA than those without learning disabilities, even when the accommodations of an IEP are in place (Hampton & Mason, 2003).

One of the most common manifestations of learning disabilities is difficulty converting abstract knowledge into applied knowledge (Bender, 2007). This is an important factor for STEM education, as many of the concepts are incredibly abstract when presented without context (Stone, 2011).

In STEM fields, there are known differences in the performance of students with learning disabilities on STEM assessments (Boaler, 1998; Kieran, 1992; Woodward & Montague, 2002). This examination has led researchers to conclude that there may be a large advantage to allowing students with learning disabilities to approach abstract concepts, like those in STEM education, through applied means (Furner & Kumar, 2007; Stone, 2011). Researchers have explained the importance of examining performance of students with learning disabilities within research studies. Bender (2008) outlined the importance of ensuring educational researchers are mindful of the ways in which students with learning disabilities learn content and perform on assessments. Bender (2007) also shared the critical need to provide LD students with differentiated instruction that allows them to experience education in the teaching strategy most closely aligning with their capacity for learning. Cognitive sequencing is a way to differentiate instruction and provide assistance for students with learning disabilities, especially related to presenting information using the cognitive sequence students prefer to grasp information in first (Woodward & Montague, 2002).

CTE courses are home to a disproportionate number of students with learning disabilities (Wagner, Newman, & Javitz, 2015). In a national study of more than 9,000 public high school students with learning disabilities, 96.0% had taken at least one CTE course during their high school tenure (Wagner, et. al., 2015). To further demonstrate the broad-scale involvement of LD students in CTE courses, the study revealed that CTE courses accounted for nearly one-fifth (19.7%) of all high school credits earned by LD students (Wagner, et. al., 2015). By comparison, CTE courses only accounted for 12.8% of the total credits earned by all high school students combined (Wagner, et. al., 2015).The most accessible factor for classifying LD students is the presence of an IEP on file with the school (Bender, 2008). It is important to note that learning disabilities are varied, and that each level and type of LD has a different potential effect on student academic performance. The presence or absence of LD classification is not a perfect indicator of student academic ability, however, it can be useful in classifying students who typically need supplemental educational assistance, and therefore, have learning differences from their peers (Bender, 2007).

The foundational theory used to frame this study was Kolb’s (1984, 2015) experiential learning theory. Kolb’s model, is a “dynamic view of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction” (Kolb, 2015, pp. 50-51). This model shows the cyclical process of learning as a relationship between the four modes of active experimentation (AE), concrete experience (CE), reflective observation (RO) and abstract conceptualization (AC) as shown in Figure 1 (Kolb, 1984, 2015). This study was developed using experiential learning theory to examine student preferences for grasping information and to purposefully sequence information as it was presented to students.

**Purpose and Objectives**

The purpose of this portion of a larger study was to examine learning disability classification status as a variable related to preference for grasping information through experiential learning theory. To accomplish this purpose, the following objectives were used to frame the examination:

1. Describe the pretest and posttest scores for students with and without learning disability classification.
2. Describe the change in pretest and posttest scores for students with and without learning disability classification when information is presented in a sequence matching student learning preference.

**Methods**

This study was conducted as a quasi-experimental cross-over examination of the factors related to student learning on STEM content assessments in agricultural education. The crossover design was chosen based on the ability of this design to provide an examination of the effects of two separate treatments on each participant, in an effort to decrease threats to external validity (Shadish, Cook, & Campbell, 2002). The dependent variables in this study were the change scores from pretest to posttest on two researcher-developed assessments for science-infused units of instruction. Independent variables of interest for this portion of the study included learning disability classification and preference for grasping information through either apprehension (CE) or comprehension (AC).

This study included participation from students enrolled in a freshman level introduction to agriculture course at three Texas high schools (*N* = 105). A total of *n* = 103 students completed the consent and assent process. Two separate week-long units of instruction were created, one in water science and one in soil science. Each of the content area units were created with two cognitive sequences, one with lesson plans presenting each new concept through a concrete experience and moving to abstract conceptualization, and another complementary unit with lesson plans presenting each new concept first through abstract conceptualization and then progressing to a concrete experience activity. Each test unit (site) received both content areas, and sites were randomized as to which content area and cognitive sequence they would receive first. Identical pre and post-test assessments were given to students for each content area, regardless of the cognitive sequence of instruction. A group of experts in agricultural education, experiential learning theory, and curriculum planning assisted in the preparation and development of the treatment curricula. Instructors at each school were trained in the utilization of the curriculum models provided and signed agreements of compliance to verify their instruction of the units exactly as presented in the trainings.

Unit assessments were developed to directly assess each of the unit objectives with exam questions at multiple levels of cognition. Reliability coefficients (*KR-20*) were 0.75 for the water science pretest and 0.78 for the water science posttest. For the soil science tests, the resulting reliability coefficients (*KR20*) were 0.81 for the pretest and 0.86 for the posttest. Reliability coefficients derived from a *KR-20* analysis for teacher-made tests are considered to be acceptable at a level of 0.65 or higher (Frisbie, 1988), thus the reliability of both unit assessments were deemed acceptable for the intended purpose of this study. To determine the learning style preference for respondents in regard to grasping information, *KLSI v. 3.1* instrument was used. Validity of the KLSI v. 3.1 has been widely established for use in the field of education (Kolb & Kolb, 2005). Validity was determined to be acceptable for the purposes of this study. Previous measures of reliability for the four learning modes included in the KLSI range from α = 0.77 to α = 0.84 (Kolb & Kolb, 2005). As such, the reliability was determined to be suitable for use in this study.

To collect the information related to learning disability classification, teachers provided a verification of student LD based on the presence of an IEP requiring instructional modifications. In one site, LD classification was not readily available to teachers. We contacted school district personnel who were able to provide the data directly. Resulting data were analyzed using IBM SPSS © version 23.

**Findings**

The majority of all students (*n =* 75) had a preference for grasping through apprehension. Student preferences for learning based on apprehension or comprehension were similar for those with and without learning disability classification. Preferences for grasping information are shown in Table 1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1  *Student Preferences for Grasping Through Apprehension (CE) or Comprehension (AC)* | | | | | |
| LD Classification | *f* | Apprehension Preference | | Comprehension Preference | |
| *f* | % | *f* | % |
| LD | 30 | 22 | 73.3 | 8 | 26.7 |
| No LD | 73 | 53 | 72.6 | 20 | 27.4 |
| Total | 103 | 75 | 72.8 | 28 | 27.2 |

Students with learning disabilities had lower scores on the pretest for both the water science and soil science units than those students without a learning disability. Pretest scores are shown in Table 2.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 1  *Mean Pretest Scores for Water Science and Soil Science Units by Learning Disability Classification* | | | |
| LD Classification | *n* | Water Science Unit *M*(*SD*) | Soil Science Unit *M*(*SD*) |
| LD | 30 | 17.*70(16.44)* | 16.16(*14.58)* |
| No LD | 73 | 23.*00(18.95)* | 19.61*(14.61)* |
| Total | 103 | 21.46*(18.42)* | 19.04*(16.27)* |

Changes in score from pretest to posttest were examined related to student learning disability classification and student preference for grasping information. Students with learning disabilities showed larger changes in scores when the information was presented in the sequence matching their learning preference. Results for change scores when information was presented in a sequence matching preference are shown in Table 2. Results for change scores when information was presented in a sequence opposite preference are shown in Table 3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 2  *Change Scores for Water Science Unit Based on Sequence of Unit, Match to Learning Preference, and Learning Disability classification* | | | | |
| LD Classification | Sequence of Unit | | | |
| *n* | Matched to Preference *M*(*SD*) | *n* | Opposite of Preference *M*(*SD*) |
| LD | 13 | 63.38*(17.31)* | 17 | 24.94*(19.95)* |
| No LD | 20 | 63.65*(21.19)* | 53 | 36.92*(17.46)* |
| Total | 33 | 63.55*(19.75)* | 80 | 31.44*(18.11)* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3  *Change Scores for Soil Science Unit Based on Sequence of Unit, Match to Learning Preference, and Learning Disability classification* | | | | |
| LD Classification | Sequence of Unit | | | |
| *n* | Matched to Preference *M*(*SD*) | *n* | Opposite of Preference *M*(*SD*) |
| LD | 17 | 55.53*(18.54)* | 13 | 28.00*(18.19)* |
| No LD | 53 | 60.32*(17.68)* | 20 | 34.65*(14.20)* |
| Total | 80 | 59.16*(18.01)* | 33 | 32.03*(16.32)* |

**Conclusions/Implications**

All students showed increases in change scores when the information was delivered in the sequence matching their learning preferences. Changes were more prominent for students with learning disabilities when sequences were opposite their preference for grasping information. Sequencing instruction based on individual student preferences for grasping information has close ties to the literature related to differentiated instruction. Tomlinson (2001) points out the importance of tailoring educational practices to meet the needs of each student. The findings of this study give an example of just how critical differentiated instruction is when dealing with STEM concepts in agricultural education classes.

More students with learning disabilities had a preference for grasping information through apprehension than comprehension. These students likely benefit from enrollment in an agricultural education course that focuses on providing concrete experiences for grasping abstract concepts. By this token, it is promising that agricultural education has increased proportions of students with learning disabilities who are able to experience the experiential learning cycle more completely. Of course, students can only fully realize the benefits found from cognitive sequencing through ELT in agricultural education if agricultural educators have the skills required to teach using a full ELT model. We recommend teacher educators ensure both preservice and in-service teachers are instructed on the proper integration and use of all four components of the ELT cycle through preservice instruction and professional development training.

Because all of the students in this study were enrolled in general education courses, it is likely that the students with learning disabilities in this study required only minor modifications to instruction. It is a limitation to this study that individuals with learning disabilities could not be identified based on their specific accommodation plans. Students with preferences for grasping through both apprehension and comprehension exist in an agricultural education classroom, so which of the cognitive sequences is better suited for development of curriculum materials? Perhaps rather than looking at the sequence as an either or concept, the answer would be to include both sequences within units in order to ensure the needs of all students are met. This small change to educational methods may have broad-reaching effects, not only for students without learning disabilities, but for all students in agricultural education classrooms.

**References**

Bender, W. N. (Ed.). (2007). *Differentiating instruction for students with learning disabilities: Best teaching practices for general and special educators*. Thousand Oaks, CA: Corwin Press.

Bender, W. N. (2008). *Learning disabilities: Characteristics, identification, and teaching strategies*. Boston, MA: Allyn & Bacon.

Boaler, J. (1998). Open and closed mathematics: Student experiences and understandings. *Journal for Research in Mathematics Education, 29*(1), 41-62. doi: 10.2307/749717

Frisbie, D. A. (1988). Reliability of scores from teacher‐made tests. *Educational Measurement: Issues and Practice*, *7*(1), 25-35.

Furner, J. M., & Kumar, D. D. (2007). The mathematics and science integration argument: A stand for teacher education. *Eurasia Journal of Mathematics, Science & Technology Education*, *3*(3).

Hampton, N. Z., & Mason, E. (2003). Learning disabilities, gender, sources of efficacy, self-efficacy beliefs, and academic achievement in high school students. *Journal of School Psychology*, *41*(2), 101-112

Kieran, C. (1992), The learning and teaching of school algebra. In D. A. Grouws (Ed.), *The handbook of research on mathematics teaching and learning* (pp. 390-419). New York, NY: Macmillan.

Kolb D. (1984). *Experiential learning as the science of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (2nd Ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Kolb, A. Y., & Kolb, D. A. (2005). *The Kolb Learning Style Inventory version 3.1 2005 technical specifications.* Philadelphia, PA: HayGroup. Retrieved from http://learningfromexperience.com/media/2010/08/tech\_spec\_lsi.pdf

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin Company.

Sousa, D. A. (2011). *How the brain learns*. Thousand Oaks, CA: Corwin Press.

Stone III, J. R. (2011, May). *Delivering STEM education through career and technical education schools and programs.* Paper presented at the National Research Council Workshop on Successful STEM Education in K-12 Schools. Retrieved from http://www7.nationalacademies.org/bose/STEM\_Schools\_Workshop\_Paper\_Stone.pdf.

Wagner, M. M., Newman, L. A., & Javitz, H. S. (2015). The benefits of high school Career and Technical Education (CTE) for youth with learning disabilities. *Journal of Learning Disabilities*, 1-13. doi: 10.1177/0022219415574774

Woodward, J. & Montague, M. (2002). Meeting the challenge of mathematics reform for students with LD. *Journal of Special Education, 36*(2), 89-101.

**Why Agriculture Teachers Intend to Leave Teaching: Towards a Model of Agriculture Teacher Turnover Intentions**

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**Abstract**

*Agricultural Education is facing a shortage of qualified agriculture teachers. One potential reason for the shortage is teacher turnover. The purpose of this study was to determine the factors that influence agriculture teacher turnover intentions and to refine existing models of agriculture teacher turnover intentions. The population for this study consisted of approximately 11,000 secondary agriculture teachers in the United States during the 2014-2015 school year. Exploratory Factor Analysis was conducted and five factors of agriculture teacher turnover intentions emerged: work-family conflict, compensation, personal or family, workplace conditions, and advancement. Recommendations and A new model of agriculture teacher turnover intentions are discussed.*

**Introduction and Need for the Study**

The shortage of agriculture teachers in this country is a problem that has drawn substantial attention of policymakers, researchers, and administrators over the past few decades (Foster, Lawver, & Smith, 2014; Kantrovich, 2010). One potential reason for the shortage of agriculture teachers is turnover – teachers leaving the profession before retirement. Little empirical evidence exists nationally that answers the question, “what factors influence agriculture teachers’ likelihood of teacher turnover?” The purpose of this study was to examine that question. The cost of teacher turnover impacts schools and school systems in a variety of ways. By exploring the factors related to teacher turnover, researchers, policymakers, and agricultural education professionals at local, state, and national levels will be able to identify teachers most at risk for turnover and develop initiatives that ameliorate the conditions that influence agriculture teachers’ decisions to exit the profession early.

**Theoretical Framework and Literature Review**

The theory of teacher attrition (Grissmer & Kirby, 1987; Kirby & Grissmer, 1993), which is based on the human capital theory, has been used extensively in educational research to help explain why teachers leave their career early. The theory of teacher attrition posits teachers make systematic evaluations of the monetary and non-monetary benefits from different occupations, and based upon those evaluations, teachers make decisions to either leave or remain in teaching depending on which options result in the greatest returns.

The literature explaining teacher turnover is expansive. However, in agricultural education the empirical literature exploring the significant factors related to a teachers’ intention to leave or remain in the profession is somewhat sparse and lacks national generalizability. Most studies in agricultural education have only focused on regional populations of agriculture teachers. Furthermore, many studies have examined antecedents of teacher turnover with job satisfaction rather than turnover intentions or actual turnover. Literature in agricultural education has found lack of administrative support (Boone & Boone, 2007; Walker, Garton, and Kitchel, 2004), excessive workload (Chaney, 2007), low salary (Boone & Boone, 2007), student discipline issues (Boone & Boone, 2007; Mundt & Connors, 1999; McKim & Velez, 2015; Myers et al., 2005), teacher self-efficacy (Blackburn & Robinson, 2008; McKim & Velez, 2015; Swan, 2005; Wheeler & Knobloch, 2006), and work-family conflict (Crutchfield, Ritz, & Burris, 2013; Foster, 2001; Murray, Flowers, Croom, & Wilson, 2011; Sorensen & McKim, 2014; Sorensen, McKim, & Velez, 2016) as factors influencing teacher turnover intentions. Turnover intentions seem to also be influenced in part by career stage and gender (Foster, 2001; Kelsey, 2006; Murray et al., 2011; Myers, Dyer, & Washburn, 2005; Osborne, 1992)

Researchers have recently conceptualized a model of teacher turnover in agricultural education in which factors from various sources of educational literature were identified in relation to job satisfaction and teacher turnover (Tippens, Ricketts, Morgan, Navarro, & Flanders, 2013). These factors included; a) family and personal factors (e.g. other job opportunities, children and family responsibilities), b) compensation (e.g. salary), c) employment factors (e.g. teacher experience), and d) working conditions (e.g. administrative support, school environment, and student behavior). Although this model has served as a framework from which to examine the issues of teacher turnover in recent years, questions remain about its predictive power and reliability in predicting agriculture teacher turnover across the United States. Much of the proposed model (Tippens et al., 2013) was based on literature outside of agricultural education and was also developed based on regional or state-wide studies of agricultural educators. A more comprehensive model of agriculture teacher turnover intentions that is empirically tested with agriculture teachers and has a scope that encompasses the national population of school based agricultural educators in the United States would be of great benefit to the profession.

**Purpose & Objectives**

The purpose of this study was to determine the factors that influence agriculture teacher turnover intentions and to refine existing models of agriculture teacher turnover intentions. This research aligns with the National Research Agenda priority area three which calls a sufficient scientific ad professional workforce that addresses the challenges of the 21st century, specifically calling for research into the practices supporting the success of agricultural educators “at all stages of their career” (Stripling & Ricketts, 2016, p. 31). The following research objectives guided this study: 1) describe and rank the variables associated with the likelihood of early career exit; 2) conduct exploratory factor analysis to categorize variables into factors influencing teacher turnover intentions; and 3) compare factors of early career exit by gender and career phase.

**Methods**

The population for this study consisted of approximately 11,000 secondary agriculture teachers in the United States during the 2014-2015 school year. A simple random sample from the entire population of secondary agriculture teachers in the United States was utilized. A sample frame of 778 agriculture teachers was obtained from the National FFA Organization and consisted only of names and email addresses. The instrument was sent to all potential respondents using the tailored design method (Dillman, 2007). A total of 234 usable surveys were collected yielding a response rate of 30.08% (*n* = 234). Early and late-respondents were compared in an effort to check for response bias, and no significant differences were found among them.

Factors for which agriculture teachers were likely to leave teaching before retirement (objective 1) were measured by asking participants “I would likely leave my current job as an agriculture teacher…” followed by a list of twenty factors. These factors were derived from literature on teacher turnover and from the teacher questionnaire of the SASS (Chaney, 2007; Foster, 2001; Ingersoll, 2001; Macdonald, 1999; Tippens et al., 2013) and modified for this study. Participants rated items on a 6-point scale (from 1 = *strongly disagree* to 6 = *strongly agree*). These results were analyzed and reported using means and standard deviations and reported in rank order. In order to categorize variables into factors associated with the likelihood of career exit among agriculture teachers (objective 2), a maximum likelihood exploratory factory analysis with oblimin rotation and Kaiser normalization was conducted. Each item was grouped into a factor based on factor loadings. A reliability analysis on each of the new factors was conducted and then the new factors were computed into new variables for analysis. Means and standard deviations were then reported for the new factors. Factors were then compared by gender and career phase to determine if any significant differences existed (objective 3).

**Findings**

Demographic information was collected from respondents (*n* = 234). Of the responding teachers, 40.17% were female, 59.83% were male. Respondents ranged from 22 to 69 years old with the mean age being 40.26. Objective one sought to describe and rank the variables associated with the likelihood of career exit. Overall, agriculture teachers reported the highest likelihood of leaving their teaching position; 1) for a more desirable job opportunity (*M*=3.90, SD= 1.49), 2) for an opportunity to move up in their career (*M*=3.72, SD= 1.57), and 3) because of family reasons (*M*=3.67, SD=1.44). The reasons agriculture teachers indicated as the least likelihood of leaving their teaching position consisted of; 1) to change teaching subject areas (*M*=2.11, SD= 1.34), 2) to move into an administrative position (*M*=2.44, SD= 1.52), and 3) to obtain more education (*M*=2.45, SD= 1.28).

Objective two sought to categorize variables of career exit into factors through exploratory factor analysis. The analysis grouped the reasons for early career exit into five factors, and loadings of less than .40. Only factors with Eigenvalues greater than 1 and items with factor loadings greater than .40 were retained in the final factor structure (Tabachnick & Fidell, 1996). Factor 1, labeled “work-family conflict,” contained three items (*it is not compatible with raising a family*, *because of the excessive workload*, and *for parenthood responsibilities/rearing children*) (Eigenvalue= 7.41, Variance=37.03%); Factor 2, labeled “compensation,” contained three items (*because of poor benefits and incentives*, *due to lack of compensation for the amount of work done*, and *because of poor salary*) (Eigenvalue =1.74, Variance= 8.70%); Factor 3, labeled “personal or family,” contained two items (*because of family reasons* and *because of personal reasons such as health*) (Eigenvalue=1.44, Variance=7.19%); Factor 4, labeled “workplace conditions,” contained four items (*because of poor working environment*, *because of dissatisfaction with the job*, *because of poor administrative support*, and *because of student reasons*) (Eigenvalue =1.38, Variance= 6.91%); and Factor 5, labeled “advancement,” contained three items (*to move into an administrative position*, *for an opportunity to move up in career*, and *obtain more education*) (Eigenvalue= 1.05, Variance= 5.23%). These five factors explained 65% of the variance in likelihood to leave the agriculture teaching profession. Items that did not load into factors were, *for more desirable job opportunity*, *for early retirement, to accommodate spouse/partner’s career*, *to be a teacher in a better school or community*,and *to change teaching subject areas*.

Research objective three sought to compare factors related to turnover intentions by gender and career phase. Overall, agriculture teachers in this study perceived the highest likelihood of early career exit for personal and family reasons (*M* = 3.43, *SD* = 1.31) and compensation reasons (*M* = 3.38, *SD* = 1.43), and lowest likelihood of early career exit for work-family conflict (*M* = 2.68, *SD* = 1.08) and advancement (*M* = 2.85, *SD* = 1.13). Females were significantly more likely than males to leave teaching because of work-family conflict (see Table 1). For the other four factors related to turnover intentions, there were no statistically significant differences found across gender. Teachers’ sex was found to have a small-medium effect (Cohen, 1988) on work-family conflict related to turnover intentions (*d* = .47).

Table 1

*Comparison of Factors Related to Turnover Intentions by Gender (n = 234)*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Female  (*n* = 94) | |  | Male  (*n* = 140) | |  | *t* |  | *p* |  | Cohen’s *d* |
|  | *M* | *SD* |  | *M* | *SD* |  |  |  |
| Work-family conflict | 3.65 | 1.25 |  | 3.07 | 1.18 |  | 3.51 |  | .001 |  | 0.47 |
| Compensation | 3.31 | 1.32 |  | 3.43 | 1.53 |  | -0.63 |  | .530 |  | 0.08 |
| Personal or family | 3.47 | 1.22 |  | 3.38 | 1.39 |  | 0.50 |  | .619 |  | 0.07 |
| Workplace conditions | 3.00 | 1.11 |  | 3.07 | 1.23 |  | 0.41 |  | .679 |  | -0.06 |
| Advancement | 2.90 | 1.13 |  | 2.82 | 1.15 |  | 0.53 |  | .596 |  | 0.07 |

*Note.* Factors based on a six-point scale which ranged from 1 = “Strongly Disagree” to 6 = “Strongly Agree” with larger means indicating a higher likelihood of turnover than smaller means.

Pre-tenure teachers reported the highest likelihood of turnover due to work-family conflict, compensation, personal of family, and workplace conditions than the other career phase groups (see Table 2). Career stage was found to have a medium (Cohen, 1988) effect on work-family conflict (*η* = .34), as a factor of turnover intentions. Late-career teachers were also significantly less likely to leave teaching than pre-tenure and early-career teachers for better compensation, and workplace conditions. Additionally, late-career teachers were significantly less likely than all other career phase teachers to leave teaching early for advancement purposes. Career stage was found to have a medium effect on advancement (*η* = .27), as a factor of turnover intentions. Career phase had small (Cohen, 1988) effect on the factors of compensation, personal or family, and workplace conditions.

Table 2

*Comparison of Factors Related to Turnover Intentions by Career Phase*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Pre-Tenure  (*n* = 37) |  | Early-Career (*n* = 64) |  | Mid-Career (*n* = 62) |  | Late-Career (*n* = 58) | *F* |  | *p* |  | Eta (*η)* effect size |
|  | *M*  *(SD)* |  | *M*  *(SD)* |  | *M*  *(SD)* |  | *M*  *(SD)* |  |  |
| Work-family conflict | 3.86a  (1.31) |  | 3.59ab  (1.22) |  | 3.31b (1.11) |  | 2.69c  (1.08) | 9.30 |  | .000 |  | .34 |
| Compensation | 3.63a (1.38) |  | 3.60a  (1.32) |  | 3.39ac  (1.47) |  | 2.94c  (1.49) | 2.70 |  | .046 |  | .19 |
| Personal or family | 3.56 (1.29) |  | 3.53  (1.29) |  | 3.41  (1.21) |  | 3.26  (1.46) | 0.56 |  | .644 |  | .09 |
| Workplace conditions | 3.26a (1.26) |  | 3.14a  (1.08) |  | 3.08ac  (1.13) |  | 2.70c  (1.20) | 2.31 |  | .078 |  | .18 |
| Advancement | 3.05a (1.11) |  | 3.15a  (1.25) |  | 2.88a  (1.04) |  | 2.36b  (0.91) | 5.75 |  | .001 |  | .27 |

*Note.* Factors based on a six-point scale ranging from 1=“Strongly Disagree” to 6=“Strongly Agree” with larger means indicating a higher likelihood of turnover. Means with different letter superscripts in each row are significant at *p*<.05 based on Scheffe’s post-hoc tests for equal variances.

C**onclusions and Recommendations**

The findings indicate novice teachers are those with the highest intentions for turnover, which is supported by the theory of teacher attrition (Grissmer & Kirby, 1987; Kirby & Grissmer, 1993). According to the theory of teacher attrition, new teachers, have not invested much in their career, and therefore the benefits of changing careers may be greater than remaining in the profession. Our findings indicate male and female agriculture teachers are similar regarding the factors related to turnover intentions. However, females were significantly more likely than males to leave teaching because of work-family conflict. Studies in agricultural education have suggested that because of traditional gender roles, females do indeed struggle to balance work and family roles and must often have to make the difficult decisions related to work and family responsibilities (Foster, 2001; Murray et al., 2011).

Our findings suggest five major factors influence agriculture teacher turnover intentions: that explain 65% of the variance in turnover intention. We propose these five factors as the basis of a model for agriculture teacher turnover intentions. Our findings are similar to the model proposed by Tippens and colleagues (2013) with the exception of employment factors. The five factors, which explained 65% of the variance in turnover intention, suggests a reasonably strong model for agriculture teacher turnover intentions. Although agriculture teachers have repeatedly reported high job satisfaction, perhaps job dissatisfaction does in fact account for a portion of the other 35% of variance as suggested by some agricultural education research (Sorensen & McKim, 2014). We recommend more research be conducted examining how the five factors of teacher turnover intentions we found in this study are related to job satisfaction or other factors not explored in this study. We also recommend studies replicate our research in an effort to validate this model of agriculture teacher turnover intentions. Finally, we recommend instrument development based on these findings (e.g., the five factors of turnover intentions).

**References**

Blackburn, J. J., & Robinson, J. S. (2008). Assessing teacher self-efficacy and job satisfaction of early career agriculture teachers in Kentucky. *Journal of Agricultural Education, 49*(3), 1-11. doi: 10.5032/jae.2008.03001

Boone, H. N., & Boone, D. A. (2007). Problems faced by high school agricultural education teachers. *Journal of Agricultural Education*, *48*(2), 36-45. doi:10.5032/jae.2009.01021

Chaney, C. A. (2007). *Work-life variables influencing attrition among beginning agriscience teachers of Texas* (Doctoral dissertation). Retrieved from http://repositories.tdl.org/

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nded). Hillsdale, NJ: Erlbaum.

Crutchfield, N., Ritz, R., & Burris, S. (2013). Why agricultural educators remain in the classroom. *Journal of Agricultural Education*, *54*(2), 1-14. doi:10.5032/jae.2013.02001

Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). Hoboken, NJ: John Wiley & Sons, Inc.

Foster, B. B. (2001). Choices: A dilemma of women agricultural education teachers. *Journal of Agricultural Education*, *42*(3), 1-10. doi:10.5032/jae.2001.03001

Foster, D. D., Lawver, R. G., Smith, A. R., (2014).  *National agricultural education supply & demand study: 2014 executive summary.* A report from the American Association for Agricultural Education. Retrieved from http://aaaeonline.org/Resources/Documents/NSDSummary\_3\_1\_2015\_Final.pdf.

Grissmer, D. W., & Kirby, S. N. (1987). Teacher attrition: The uphill climb to staff the nation’s schools. Santa Monica, CA: RAND. Retrieved from http://www.rand.org/content/dam/rand/pubs/reports/2007/R3512.pdf

Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*, 449-534.

Kantrovich, A. J. (2010). *A national study of the supply and demand for teachers of agricultural education from 2007-2009.* American Association for Agricultural Education.Retrieved fromhttp://www.naae.org/links/resources/docs/2010-supply-Demand-study-report.pdf

Kelsey, K. D. (2006). Teacher attrition among women in secondary agricultural education. *Journal of Agricultural Education, 47*(3), 117-129. doi: 10.5032/jae.2006.03117

Kirby, S. N., and Grissmer, D. W. (June, 1993). *Teacher attrition: Theory, evidence, and suggested policy options.* Paper presented at the World Bank/Harvard Institute for International Development Seminar on “Policies Affecting Learning Outcomes through Impacts on Teachers”, Cambridge, MA: RAND. Retrieved from http://www.rand.org/content/dam/rand/pubs/papers/2009/P7827.pdf

Macdonald, D. (1999). Teacher attrition: A review of literature. *Teaching and teacher education*, *15*(8), 835-848.

Mundt, J. P., & Connors, J. J. (1999). Problems and challenges associated with the first years of teaching agriculture: A framework for preservice and inservice education. *Journal of Agricultural Education*, *40*(1), 38-48. doi:10.5032/jae.1999.01038

McKim, A. J., & Velez, J. J. (2015). Exploring the relationship between self-efficacy and career commitment among early career agriculture teachers. *Journal of Agricultural Education*, *56*(1), 127-140. doi: 10.5032/jae.2015.01127

Murray, K., Flowers, J., Croom, B., & Wilson, B. (2011). The agricultural teacher’s struggle for balance between career and family. *Journal of Agricultural Education*, *52*(2), 107-117. doi: 10.5032/jae.2011.02107

Myers, B. E., Dyer, J. E., & Washburn, S. G. (2005). Problems facing beginning agriculture teachers. *Journal of Agricultural Education*, *46*(3), 47-55. doi:10.5032/jae.2005.03047

Osborne, E. (1992). A profession that eats its young. *Agricultural Education Magazine*, *64*(12), 3-4.

Sorensen, T. J., & McKim, A. J. (2014). Perceived work-life balance ability, job satisfaction, and professional commitment among agriculture teachers. *Journal of Agricultural Education*, *55*(4), 116-132. doi: 10.5032/jae.2014.04116

Sorensen, T. J., McKim, A. J., & Velez, J. J. (2016). Why agriculture teachers leave: A national examination of turnover intentions and work-family conflict. *Journal of Agricultural Education, 57*(4), 186-201. Doi: 10.5032/jae.2016.04186

Stripling, C. T. & Ricketts, J. C. (2016). Research priority 3: Sufficient scientific and professional workforce that addresses the challenges of the 21st century. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020* (pp. 29-35).Gainesville, FL: Department of Agricultural Education and Communication.

Swan, B. G. (2005). *The relationship between the 2004 Ohio State University Agricultural Education student teachers’ learning style, teacher heart, and teacher sense of efficacy.* (Unpublished doctoral dissertation). The Ohio State University, Columbus.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York, NY: HarperCollins.

Tippens, A., Ricketts, J. C., Morgan, A. C., Navarro, M., & Flanders, F. B. (2013). Factors related to teachers’ intention to leave the classroom early. *Journal of Agricultural Education*, *54*(4), 58-72. doi: 10.5032/jae.2013.04058

Walker, W. D., Garton, B. L., & Kitchel, T. J. (2004). Job satisfaction and retention of secondary agriculture teachers. *Journal of Agricultural Education*, *45*(2), 28-38. doi:10.5032/jae.2004.02028

Wheeler, J., & Knobloch, N. A. (2006). Relationship of teacher and program variables to beginning agriculture teachers’ sense of efficacy. *Proceedings of the National Agricultural Education Research Conference, Charlotte, NC, 33, 590-600.*

**A Qualitative Evaluation of Early Career Agriculture Teachers’ Perceptions of Professional Development through California’s New Professionals Institute**

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**Abstract**

*The purpose of this study was to describe the perceptions of early career agriculture teachers who participated in the 2016 New Professionals Institute [NPI]. The sample was purposively selected (n=9) for maximum variation from teachers in their first, second, or third year of teaching in California in attendance at the 2016 NPI. Semi-structured interviews were conducted using questions adapted from Guskey’s professional development evaluation model. Constant comparative analysis was conducted to create themes and provide rich descriptions of attendee attitudes. The three themes explored were Participant Reaction, Participant Learning, and Organizational Support. Participant Reaction was supported through adequate facilities, teacher choice, high quality presenters, length of workshop time, and opportunity for collaboration. Participant Learning revealed organizational strategies, usable material, and programmatic-related material to be of value. Exploration of Organizational Support exposed logistical challenges as well as collegial support being barriers to implementation while upper school administration is very supportive. Information gleaned from the study will aid in the continued planning and implementation of the NPI.*

**Introduction/Theoretical Framework**

Retaining highly qualified high school agriculture teachers is a national issue and one that challenges California in particular. Smith, Lawver, and Foster (2017) indicated 721 of United States [US] secondary agriculture teachers, did not return to the high school agriculture classroom for the 2016-2017 school year. The literature reveals opportunities for mentoring and induction programs which bridge pre-service teaching experiences with first year teaching experiences can increase teacher effectiveness and retention, regardless of subject area, grade level, or country (Eberhard, Reinhardt-Mondragon, & Stottlemyer; Odell & Ferraro, 1992; 2000, Moore & Swan, 2008).

In 1996, California introduced the New Professionals Institute [NPI], a Professional Development [PD] event designed for first, second, and third year agriculture teachers. One hundred % of California first, second, and third year secondary agriculture teachers are invited to the two-day event, held each Fall. The goal of the event is to provide specific PD for new teachers in regard to curriculum creation and delivery, program management strategies, Supervised Agricultural Experience [SAE] project supervision, and FFA advisor responsibilities. The NPI also allows for collaboration and interaction with contemporaries, more experienced agriculture teachers, state agricultural education leadership, and industry professionals. The NPI is one of California’s main efforts focused at the PD of new teachers in the profession.

PD is defined as “those processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators that they might, in turn, improve the learning of students” (Guskey, 2000, p. 16) and a “dynamic and highly personal endeavor” (Guskey & Huberman, 1995, p. 7). The process of PD is (a) intentional, (b) ongoing, and (c) systematic, while not seeking to find flaw, but to build upon strength (Guskey, 2000). The literature reveals a history of negativity surrounding PD in regard to its purpose and effectiveness (Díaz-Maggioli, 2004; Fuller, 1969), as well as a need to focus PD programs on the career phase of the teacher (Guskey, 1986; Huberman, 1989; Katz, 1972). PD is critical to the enhancement of our teachers, our students, and our educational system.

Based on the work of Kirkpatrick (1979), Guskey (2000) described a model for evaluating PD to encompass factors specific to education. Level 1-*Participants’ Reactions* is the most simple and common measurement used in PD evaluation. Quantitative rating scales as well as open-ended prompts allow for participant feedback. Level 2-*Participants’ Learning* reflects the knowledge, skills, and attitudes of the participants after their PD experience. Measuring this level requires prior creation of specific criteria and/or indicators which can be used to assess learning. Level 3-*Organization Support and Change* is centered on the function of the organizational characteristics present to facilitate a successful implementation of knowledge, skills, and attitudes acquired via PD. This may involve in depth analysis of district and site policies, goals, and objectives. Guskey (2000) defines two remaining levels (Level 4-*Participants’ Use of Knowledge and Skills* and Level 5-*Student Learning Outcomes)*, but they are not the focus of this evaluation.

**Purpose(s)/Objective(s)**

The purpose of this study was to qualitatively examine the perceptions of California agriculture teachers concerning their experiences at the NPI and the impact of those experiences on their PD, utilizing three of the five levels described by Guskey (2000). To achieve this purpose, the following objectives acted as guidelines:

1. Describe participants’ reactions to the overall program.
2. Describe what participants took away as learned knowledge or skills.
3. Describe organizational and administrative support of the PD event.

**Method/Procedures**

This qualitative study is rooted in constructivism as “realities are apprehendable in the form of multiple, intangible mental constructions, socially and experientially based” (Guba & Lincoln, 1994, p. 110). The population was comprised of attendees at the 2016 NPI. The researcher used purposive sampling to “represent a type in relation to key criteria” (Richie & Lewis, 2003, p. 113). Transferability was enforced using maximum variation to represent the heterogeneity of the participants, providing a range of variation (Patton, 2005) in gender and geographic region of teaching assignment. Participants selected consisted of first (n=3), second (n=3), and third (n=3) year California agriculture teachers whom attended the 2016 NPI. There were nine participants representing four different geographical agricultural education regions; six female and three male.

Participants engaged in semi-structured, 20-30 minute telephone interviews. Interpersonal approach supports constructivism by promoting interaction between investigator and respondents (Guba & Lincoln, 1994). The interviewer audio recorded each interview, as well as took handwritten notes. The semi-structured interview questions were created based on Guskey’s (2000) framework. The audio recordings of the interviews were later transcribed. Transcriptions were compared to the audio recordings and notes taken by the researcher. After all interviews, participants were given pseudonyms to protect confidentiality, and items were compared, across Guskey’s (2000) levels, to identify common themes within levels for theoretical triangulation.

Items were coded using constant comparative analysis. This aids in “generating a theory which is integrated, consistent, plausible, close to the data, and in a form which is clear enough to be readily, if only partially, operationalized for testing in quantitative research” (Glaser, 1965, pp. 437-438). Themes were developed within categories, of applicability based on items of interest, repetition, and other penetrating statements witnessed within the transcripts which, were reviewed three times. Revisiting and reconsideration of the data is indicative of constant comparative analysis which leads to increased credibility and transferability (Glaser, 1965).

Trustworthiness includes credibility, transferability, dependability and confirmability (Lincoln & Guba, 2007). Researcher familiarity with the prospective study group confirmed credibility and confirmability as did the use of member checks and the triangulation of notes, audio recordings, and observation. The coding of themes allowed for the discovery of “sufficient descriptive data” supporting transferability (Lincoln & Guba, 1985, p. 289). An audit trail and researcher journal were used for confirmation and dependability.

**Results/Findings**

*Participants’ Reactions-*The first objective of this study was to describe participants’ reactions to the overall program. Those in attendance at the 2016 NPI were positive about their experiences and offered little in terms of room to improve. The site of the conference was adequate, and perhaps summarized best by Sara, a second-year teacher “I enjoyed the Picadilly Inn. I think it’s a nice facility. The food was delicious…they provided a great dinner and I think the breakfast was great too. The bathroom was close by…it was a good facility.”

The attendees were excited to have choice in the workshops they could attend. “I have been lucky to get into the areas where I have interests in [sic]…I think the subjects are pretty cool to choose from,” said second year attendee Matt. Third year attendee Mary noted, “I liked that we were able to pick and choose the workshops this time around.” Sara reiterated this: “I mean you get to choose. The best part is that you get to pick and choose where to go.”

The quality of the presenters was perceived as high. “They’re obviously excited to be there. They were prepared,” claimed third year teacher Tom. He continued to recognize the willingness of the presenters to aid the newer teachers in their professional development. “They were welcoming to any kind of questions…they were also willing to give us information…” Mandy, a first year teacher stated, “…they sat and talked to you afterwards. They gave you all their information…and they were there to help you no matter what…”

The format in which the NPI is offered provides opportunity for teacher collaboration across university affiliation and years of experience. This component proves to be a highlight of the experience for most attendees. “I enjoyed…spending time with other new teachers and listening to them explain what’s been going on…” remarked Jennifer. Lisa said, “…the biggest part of New Professionals for me is being able to see those that I went through student teaching induction with and all of my young teacher friends.” This collaboration extends across content areas, as stated by Tom, “I enjoyed the chance to meet and interact with other young teachers and then also the thing I definitely enjoyed was meeting educators in my specialization.”

Attendees did have suggestions for how to improve the overall conference through the adjustment of session length and offerings. First year teacher Gerald said, “I wish the sessions were a little longer and more in depth.” Matt added, in regard to the workshops, they were “…cut short because they’re sharing so much information and by the time the workshop is over we don’t have the time to ask the in depth questions.”

*Participants’ Learning-*The second objective of this investigation addresses the learning of the participants during this time period. The attendees recognize the value of the all the material presented. “…I don’t like to waste professional development…I still have all of my notes…I put them all in this binder, and so whenever I need to look back at it, it’s there,” said Matt. Sara emphasized the relevance of all material: “They all kind of apply in some way.”

Organizational skills appeared to be of great value to participants. Gerald said, “I am not a very organized person…his technique really helped me with my folder management to get…better organized.” This theme bridged the first and third year teachers as well. Jennifer reflected, “The most valuable information that I got in the three years that I…attended I think was the information I got…the first year about how to organize your room, how to set up your files, how to make it so when you left…that you had your sub folders all set up and in order.”

Participant learning activities deemed valuable were program and classroom management focused. In regard to student time cards and welding coupons, agriculture mechanics teacher Mandy stated, “…it was great because he simplified everything and made it easier to teach instead of [being] overwhelmed as a new teacher.” Matt and Mary perceived the session on advisory committee meetings being very beneficial to their programs. Mary said, “…one of the most helpful workshops I’ve been to in a long time because we were trying to revamp our advisory committee.” Creating school culture was also identified as a more programmatic impact of the NPI. Mandy reacted to the presentation by saying, “…being open to having new students in your program that you never thought you would have in your program. And opening up new ideas and new doors so that more kids would want to be a part of your program.”

Another emerging theme across the material teachers learned is that of applicability. Content that could be immediately applied by the teachers was of high value and has, in some cases, already been utilized by the teacher in their local program. Jennifer said, after attending the agricultural mechanics workshop, it “helped me go back to my school and put together an ag mechanics team.” Matt claimed, “the relationship between the advisory committee and our department is better” while Mary said, “…we had a couple of good, successful advisory committee meetings so, that was a really good workshop.”

*Organization Support and Change-*Support teachers received is addressed in the third objective, where three themes emerged. First is the logistical complications of implementing ideas. Tom claimed, in regards to service learning projects, “the school and district just are not used to these ideas and so it’s really the red tape and all the paperwork…and people who feel like it’s their job to get too involved with things.” Mary identified “…simply not having enough time to prepare the idea that I wanted to put into place…”

Another barrier which emerged as a theme was support among other members of the agriculture program. Lisa alleged, “…you want to try and implement those new things but getting [teaching partners] on board with you or to let you give it a shot and try it within the chapter, that can be a little challenging.” Mary also mentioned the idea of her age being a barrier when dealing with older members of the department: “I’m kind of younger so, some of the ideas got kind of shot down by older members of the department for one reason or another.”

The dedicated support of school administration was a common remark, and composed the third theme. “I have an extremely supportive administration. They are willing to send me to any type of professional development,” said Katie. Tom felt similarly saying, “…the administration is very positive towards professional development.” This support also extends into programmatic development as Mandy suggested by saying, “…anything that we want to do as a program, or send our students to as a program, or send us to learn more, he is more than willing to help and get us to where we need to go so that we can become better teachers as well.”

**Conclusions/Recommendations/Implications**

*Participants’ Reactions* to the NPI proved positive. Guskey (2000) said this level is used to assess “if those educators who took part in the program or activity liked it, if they judged the experience to be worthwhile, and if they considered their time to be well spent” (p. 115). Attendees felt their time spent was relevant, information was useful, and they enjoyed peer collaboration. The information gained greatly impacted *Participants’ Learning.* Authentic PD should not only make the participants feel good, but they should be enhanced in both knowledge and skill as educators (Guskey, 2000). Descriptions provided by participants elude content learned has already been used within different contexts; whether curricular or programmatic. Management oriented skills are needed, particularly for the first-year teachers. The differing levels of *Organization Support and Change* can be seen among attendees. Administrative support is strong, while support of fellow agriculture teachers may not be. This collegial support is necessary for the development of teachers. “Those involved in change need to know their efforts are valued and honored by colleagues, and that ample opportunities for collaboration and sharing will be provided” (Guskey, 2000, p. 157).

The current format of the NPI is effective and relevant in the development of our young agriculture teachers as professionals. Continued implementation of the NPI is necessary to retain knowledgeable, skilled, and relevant teachers who are passionate about their careers at an early phase. The NPI may also serve as the platform for promoting collegial support among early career teachers so that they may progress through their own careers as successful mentors of future agriculture teachers.

**References**

Díaz-Maggioli, G. (2004). *Teacher-centered Professional Development*. Alexandria, VA: Association for Supervision and Curriculum Development.

Eberhard, J., Reinhardt-Mondragon, P., & Stottlemyer, B. (2000). Strategies for new teacher retention: Creating a climate of authentic professional development for teachers with three or less years of experience. *The South Texas Research and Development Center.* Retrieved from Eric database. (ED450116)

Fuller, F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal, 6*(2), 207-226. doi:10.3102/00028312006002207

Glaser, B. (1965). The constant comparative method of qualitative analysis. *Social Problems,* *12*(4), 436-445. doi:10.2307/798843

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, *2,* (105-117).

Guskey, T. R. (1986). Staff development and the process of teacher change. *Educational Researcher, 15*(5), 5-12. doi:10.3102/0013189X015005005

Guskey, T. R. (2000). *Evaluating professional development.* Thousand Oaks, CA: Corwin Press.

Guskey, T. R., & Huberman, M. (1995). *Professional development in education: New paradigms and practices.* New York, NY: Teachers College Press.

Huberman, M. (1989). The professional life cycle of teachers. *Teachers College Record, 91*(1), 31-57. Retrieved from Eric database. (EJ398425)

Katz, L. G. (1972). Development stages of preschool teachers. *Elementary School Journal, 73*(1), 50-54. doi:10.1086/460731

Kirkpatrick, D. L. (1979). Techniques for evaluating training programs. *Training and Development Journal, 33*(6), 78-92.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.

Lincoln, Y. S., & Guba, E. G. (2007). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Evaluation, 114*, 15-25. doi:10.1002/ev.223

Moore, L. L., & Swan, B. G. (2008). Developing best practices of teacher induction. *Journal of Agricultural Education, 49*(4), 60-71. doi:10.5032/jae.2008.04060

Odell, S. J., & Ferraro, D. P. (1992). Teacher mentoring and teacher retention. *Journal of Teacher Education, 43*(3), 200-204. doi:10.1177/0022487192043003006

Patton, M. Q. (2005). *Qualitative research*. John Wiley & Sons, Ltd.

Richie, J., & Lewis, J. (2003). *Qualitative research practice: A guide for social science students and researchers.* London: Sage Publications.

Smith, A. R., Lawver, R. G., & Foster, D. D. (2017). National agricultural education supply and demand study, 2016 executive summary. Retrieved from: http://aaaeonline.org /Resources/Documents/NS D2016Summary.pdf

**How Do College Students Learn about Food Systems? A Descriptive Analysis**

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**Abstract**

*There is a paucity of research specific to the agriculture literacy of adult learners (Kovar & Ball, 2013; Mars & Ball, 2016). In the current study, we analyze how one particular population of adult learners, college students, gain knowledge of food systems within formal, non-formal, and/or informal learning settings. Accordingly, we ask here, “How do college students learn about food systems?” Data were collected using a convenience sample of undergraduate students at a large research-intensive university who responded to an authentic questionnaire developed specifically for this study. Findings indicate that there is little variation between the three learning settings with respect to food system knowledge. This indicates that purposeful educational interventions specific to food system knowledge are lacking. Implications of the findings are discussed and recommendations for the development and refinement of formal and non-formal food systems curricula that account for the diverse needs, backgrounds, and experiences of undergraduate college students are provided.*

**Introduction**

Agricultural issues (e.g., food safety, food security) are among the most pressing challenges that confront contemporary society (DiBenedetto, Lamm, Lamm, & Myers, 2016). There remains a need for greater understanding of how individuals, and especially those of college-age, acquire relevant and trustworthy agricultural knowledge (Kover & Ball, 2013). In some cases, the public is exposed to agricultural information non-formally through publicly available media (Bowen, Stephens, Childers, Avery, & Stripling, 2013), while in other cases agricultural topics are integrated into formal curricula; especially at the K-12 levels (Powell, Agnew, & Trexler, 2008). Individuals can develop an understanding of agriculture more informally through routine interactions and experiences had within their families, their workplaces, and the organizations in which they belong (Foreman & Retallick, 2012). In this study, we aimed to develop a stronger understanding of how undergraduate students at a large, research-intensive university acquire agricultural knowledge, and more specifically that of which pertains to food systems, through formal, non-formal, and/or informal channels.

The agriculture literacy movement works to develop within learners a comprehensive understanding of agriculture through the delivery of curricula that captures a range of interconnected information, knowledge, and attitudes (Vallera & Bodzin, 2016). Curricula and instructional initiatives designed to foster agricultural literacy have become increasingly embedded within formal coursework, especially that which is based in the science, technology, engineering, and mathematics (STEM) disciplines in the K-12 setting (Anderson, Velez, & Thompson, 2014; Frick, Birkenholz, Gardner, & Machtmes, 1995). Concurrently, youth development organizations, such as FFA and 4-H, have taken an active role in introducing students to various agricultural topics through a range of instructional models (Powell et al., 2008). While an important component of improving agriculture literacy levels around the nation, it excludes a large portion of the population, namely those who are not enrolled in K-12 education. Unfortunately, the extensiveness of the agricultural literacy movement has been primarily confined to school-based settings and has thus failed to reach adult learners (including those in post-secondary education) (Kovar & Ball, 2013). The focus of this study is how college students acquire information specific to one primary component of agriculture: food systems.

**Theoretical Framework**

In a study of agricultural epistemologies, Mars and Ball (2016) illustrated how adult learners (including college students) develop an awareness and understanding of food systems through formal, non-formal, and/or informal learning. Here, we examined the implications of each of the three learning settings on college student acquisition of food system knowledge. Food systems span the entire process of food production and consumption beginning with planting and harvesting and ending with disposal (Chase & Grubinger, 2014). Food systems are highly complex and interwoven across local, regional, national, and global environments and economies (Born & Purcell, 2006). More specifically, we sought to better understand how college students develop food system knowledge within and at the various intersections of the three learning settings.

The knowledge gained by students through conventional classroom instruction is reflective of the formal setting (Etling, 1993). Formal learning occurs in graded educational systems (primary, secondary, post-seondary) that involve students engaging in classes that are guided by structured curricula and mandated assessments (Coombs, 1973). In the context of agricultural education, those who fall under the formal setting will have completed elementary, secondary, and/or collegiate courses that either center on agriculture or include agricultural topics as a curricular component. Here, formal coursework is examined as a potential origin of college student awareness and understanding of food production and consumption.

Non-formal learning occurs through the intentional facilitation of learning outside of formal learning environments (Kleis, 1973). Knowledge of food systems acquired through semi-structured education is representative of non-formal learning. For example, non-formal learning of agriculture is understood to occur through 4-H groups and Cooperative Extension programs.

Informal learning occurs through unplanned and unstructured interactions and intimate experiences (Ettling, 1993). Any knowledge of food systems that is gained through cultural traditions, family practices, community activities, social networking, and/or self-education is reflective of informal learning. Examples of informal learning settings relevant to food systems include community and family activities involving food production and/or consumption.

According to Chase and Grubinger (2014), a food system is composed of the following seven components: production, processing, packaging, distribution, marketing, consumption, and disposal of food. These seven components, which were defined utilizing various sources of literature, provided the framework for the questionnaire developed specifically for this study.

Kramer and Sias (2014) identified five different sources of knowledge within the context of interpersonal communication models. The sources include: family, education, peers, previous organization experiences, and media. We used these five sources to determine where and how study participants learned about each food system component. Moreover, the knowledge sources were categorized according to the formal, non-formal, or informal learning settings. Education was considered to be representative of formal learning, while previous organization experience was associated with non-formal learning. Family, peers, and media were each associated with informal learning.

**Purpose and Objectives**

Mars and Ball (2016) called for research that examines agriculture literacy as a lifelong learning process. Consistent with this call, the purpose of this study was to examine how students at a research-intensive university came to know what they know about food systems via formal, non-formal, and/or informal learning settings. The following research question guided the study: “How do college students learn about food systems?” The following four research objectives guided the study: (1) describe the demographic characteristics of the university students who attended the campus farmers’ market, (2) describe the preceding students’ perceived food system knowledge, (3) describe which sources were most influential in contributing to the preceding students’ food system knowledge, and (4) describe the differences in results between the ‘field’ demographic. These four objectives individually and collectively align with Priority Number 4 (Meaningful, Engaged Learning in All Environments) of the AAAE National Research Agenda (Roberts, Harder, & Brashears, 2016).

**Methods**

Utilizing quantitative methods, our study was designed to examine the sources of food system knowledge (FSK) of students who were shopping at a large research-intensive university campus farmers’ market. The campus farmers’ market was chosen because students attending would be more likely to have an interest in agriculture and it allowed for access to a diverse group of students. The target population for this study was undergraduate students. Participants were selected using a convenience sampling method (Farrokhi & Mahmoudi-Hamidabad, 2012). More specifically, students shopping at the campus farmers’ market who self-identified as undergraduate students at that specific university were asked to voluntarily participate in the study, which involved completing a questionnaire.

The questionnaire was designed to gain an understanding of the origins of the participants’ FSK. It was composed of five items specific to demographic information, knowledge of the seven food system components (Chase & Grubinger, 2014), and the five sources of FSK (family, education, peers, previous organization experiences, media) (Kramer & Sias, 2014). More specifically, each aspect of the food system was accompanied by five sub-categories that were intended to measure where the participants’ gained knowledge of each particular component of the food system. A description of each component of the food system (Chase & Grubinger, 2014) was included in the questionnaire. The definitions were included to decrease confusion concerning the meaning of each component. After reading each component description, each participant would individually determine how much each of the five knowledge sources as articulated by Kramer and Sias (2014) had contributed to their understanding of each food system component. A five-point Likert scale was used to measure each item.

Measurement error was addressed by following the protocols for establishing validity and reliability (Rogelberg, 2008). Content and face validity were established using a panel of five experts who were selected based on their expertise within various disciplines of agriculture. Reliability estimates of the measures were established through a pilot-test of undergraduate students (*n* = 20) at a research-intensive university who approximated the subjects. Acceptable reliability estimates were determined a priori to be .70 or higher, which is consistent with social science standards (Nunnally, 1967). The calculated test-retest reliability estimates (i.e., coefficient of stability) for items were found to be .75 or higher.

Data were collected during the spring 2017 semester. Ultimately, the sample included 50 student participants (*n*= 50). The use of a non-probabilistic sample technique eliminated any potential concern over frame or selection error (Baker et al., 2013). The sampling technique used prevented any generalization of the results beyond the participants.

Exploratory research design allowed for the identification and description of the various characteristics of college student FSK and knowledge acquisition as indicated in the proffered research objectives (Creswell, 2014). Data were summarized using measures of central tendencies and measures of variability appropriate for the scale of measurement (Pearson & Tukey, 1965). Demographic variables of the participants were captured along with the participant’s origin of knowledge on different food system components. In addition to this, each of the five sub-categories was ranked to indicate the degree to which each sub-category had contributed to participant knowledge of each food system component.

**Findings**

The first objective was to identify the demographic variables of the college students who completed the questionnaire. Of the participants, 28% *(n= 14)* identified as male, 68% *(n= 34)* identified as female, 2% *(n= 1)* identified as non-binary/third gender, and the remaining 2% *(n= 1)* self-described as ‘she’. The distribution of race across the sample was as follows: Caucasian 54% *(n= 27)*, Hispanic or Latino 26% *(n= 13)*, African American 8% *(n= 4)*, Asian/Pacific Islander 6% *(n= 3)*, Other 4% *(n= 2)*, and Native American or American Indian 2% (*n*= 1). Of the participants, 10% *(n= 5)* were freshmen, 18% *(n= 9)* were sophomores, 24% *(n= 12)* were juniors, and 48% *(n= 24)* were seniors. The final demographic variable that we captured through the questionnaire was the college (i.e., disciplinary field) in which each student was pursuing a primary degree (i.e., major). The distribution of college representation was as follows: College of Public Health 22% *(n= 11)*, College of Social and Behavioral Sciences 14% *(n= 7)*, College of Agriculture and Life Sciences 12% *(n= 6)*, College of Education 12% *(n= 6)*, College of Science 12% *(n= 6)*, College of Engineering 10% *(n= 5)*, College of Medicine 10% *(n= 5)*, College of Architecture, Planning & Landscape Architecture 6% *(n= 3)*, and the College of Fine Arts 2% *(n= 1)*.

The values offered in objectives two through four are presented according to the Likert-type scale. The Likert scale was designed as follows: 1= Contributed Nothing, 2= Contributed Slightly, 3= Contributed Some, 4= Contributed More, 5= Contributed Significantly. The second objective was to describe students’ perceived FSK. In other words, this objective described the amount of knowledge that students possessed concerning each component of the food system. The highest means across the seven components of the food system were associated with consumption and production. In fact, these are the only two components of the food system that fall above an average of 3. Conversely, the lowest means across the seven components of the food system were packaging and distribution, which were tied (*M* = 2.66).

The third objective was to describe the levels of influence each knowledge source (Kramer & Sias, 2014) had on the students’ perceived FSK. The highest means in terms of knowledge sources were education (*M* = 3.31) and media (*M* = 3.24). Conversely, the lowest source of knowledge among the components of the food system was peers (*M* = 2.57).

The fourth objective was to describe the differences in results between the disciplinary fields represented within the sample as reflected by the college in which each student was pursuing their primary degree of study. These data revealed the average influence of knowledge sources of those students pursuing degree programs in the College of Agriculture and Life Sciences (CALS) and those pursing degree programs outside of CALS (i.e., non-CALS). On average, CALS students had higher knowledge source averages in education (*M* = 3.55), previous organization experience (*M* = 3.21), and family (*M* = 3.00). Non-CALS students had higher knowledge source averages in media (*M* = 3.44) and peers (*M* = 2.62).

**Discussion, Implications, and Recommendations**

The findings suggested that, in general, college students know little about food systems beyond basic principles of production and consumption. This insight is consistent with the lack of attention given to adult learners in general by agricultural literacy practitioners and scholars (Kovar & Ball, 2013).

Incomplete knowledge of food systems presents a challenge for improvement within the higher education system. The opportunity to integrate FSK into various academic fields presents itself in the form of designing curricula to align with specific academic interests. Designing curricula could include integrating food system concepts with the content that currently composes existing curricula. While opportunities to design curricula to include FSK exist throughout the university, this concept could also be readily applied in existing agriculture-specific courses. For instance, the incorporation of information relevant to the ‘marketing’ component of food systems could be integrated into business and/or fine arts courses with the objective being to understand the creativity and strategy behind food advertisements and public awareness campaigns.

Strategies for further introducing college students to FSK via non-formal learning channels should also be considered. Additionally, new ways to engage college students in Cooperative Extension activities could also prove effective in expanding student FSK. This engagement could be promoted through more direct, campus-based marketing of Extension activities and events and the inclusion of service learning projects involving student participation in such activities and events in formal coursework.

Student FSK can also be further enhanced through more purposeful informal learning strategies. This curriculum should not be developed to change perspectives on food systems, or agriculture more generally. Instead, the purpose should be to provide a holistic, objective view of agriculture. For example, the initiation of targeted social media campaigns that have the goal of objectively informing the college student demographic about food consumption and production. Additionally, the variations associated with existing informal sources of FSK should be carefully considered during the development and implementation of the aforesaid recommendations specific to formal and non-formal learning approaches.

Finally, Kramer and Sias’s (2014) five knowledge sources are not exhaustive and thus do not encompass all vital types of food-related information outlets. In particular, the five knowledge sources do not account for face-to-face settings in which food producers and consumers directly interact (Brown & Miller, 2008). Farmers’ markets, which have been considered informal learning settings in which FSK is developed and shared (Mars & Ball, 2016), would not fall directly under any of the knowledge sources that Kramer and Sias (2014) provide. It is important to be mindful of this with regards to future research in this area.

Lastly, our study illuminates important opportunities for future research specific to agriculture literacy of college students, which remains a relatively overlooked phenomenon (Kovar & Ball, 2013; Mars & Ball, 2016). Studies that explore similar questions/objectives to those we have examined here using qualitative methodologies are encouraged. Furthermore, more detailed examinations of variations in the agricultural knowledge and perspectives held by college students according to disciplinary backgrounds, life experiences, geographical location (i.e., rural vs. suburban vs. urban), and organizational affiliations is encouraged. Finally, our study has focused on a specific aspect of agricultural literacy: food systems. Similar research that expands the scope of agricultural literacy to include additional dimensions (e.g., fiber production and consumption, public policy and regulation) is warranted.

**References**

Anderson, S., Velez, J., & Thompson, G. (2014). An analysis of K-12 teachers’ conceptions of agriculture prior to and during engagement in an agricultural literacy program. *Journal of Agricultural Education*, *55*(3), 132-146. doi:10.5032/jae.2014.03132

Baker, R., Brick, J. M., Bates, N. A., Battaglia, M., Couper, M. P., Dever, J. A., Gile, K. J., Tourangeau, R. *Non-Probability Sampling.* Retrieved April 17, 2017, from http://www.aapor.org/Education-Resources/Reports/Non-Probability-Sampling.aspx

Born, B. & Purcell, M. (2006). Avoiding the local trap: Scale and food systems in planning research. *Journal of Planning Education and Research, 26*(2), 195-207. doi:10.1177/0739456x06291389

Bowen, R. D., Stephens, C. A., Childers, C. C., Avery, E. J., & Stripling, C.T. (2013). Diffusion of social media among county 4-H programs in Tennessee. *Journal of Agricultural Education, 54*(3), 84-99. doi: 10.5032/jae.2013.03084

Brown, C. & Miller, S. (2008). The impacts of local markets: A review of research on farmers markets and community supported agriculture (CSA). *American Journal of Agricultural Economics, 90*(5), 1298-1302. doi:10.1111/j.1467-8276.2008.01220.x

Chase, L., & Grubinger, V. (2014). *Food, farms, and community: Exploring food systems.* Retrieved from https://books.google.com/books/about/Food\_Farms\_and\_Community. html?id=7diPBQAAQBAJ&printsec=frontcover&source=kp\_read\_button&hl=en#v=onepage&q&f=false

Coombs, P. (1973). *New paths to learning for rural children and youth.* New York, NY: International Council for Educational Development.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches.* Los Angeles, CA: Sage.

DiBenedetto, C. A., Lamm, K. W., Lamm A. J., & Myers, B. E. (2016). Examining undergraduate student attitude towards interdisciplinary education. *Journal of Agricultural Education*, *57*(1), 167-178. doi: 10.5032/jae.2016.01167

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

76. doi:10.5032/jae.1993.04072

Farrokhi, F., & Mahmoudi-Hamidabad, A. (2012). Rethinking convenience sampling: Defining quality criteria. *Theory and Practice in Language Studies*, *2*(4), 784-792. doi:10.4304/tpls.2.4.

Foreman, E. A., Retallick, M. S. (2012). Undergraduate involvement in extracurricular activities and leadership development in College of Agriculture and Life Sciences students. *Journal of Agricultural Education, 53*(3), 111-123. doi:10.5032/jae.2012.03111

Frick, M. J., Birkenholz, R. J., Gardner, H., & Machtmes, K. (1995). Rural and urban inner-city high school student knowledge and perception of agriculture. *Journal of Agricultural Education,* *36*(4), 1-9. doi:10.5032/jae.1995.04001

Kleis, R. J. (1973). *Non-formal education: The definitional problem*. East Lancing, MI: Michigan State University.

Kovar, K. A., & Ball, A. (2013). Two decades of agricultural literacy research: A synthesis of the literature. *Journal of Agricultural Education*, *54*(1), 167-178. doi:10.5032/jae.2013.01167

Kramer, M. W., & Sias, P. M. (2014). Interpersonal communication in formal organizations. In C. R. Berger (Ed.) *Interpersonal Communications,* Gruyter: Berlin.467-492.

Mars, M. M., & Ball, A. L. (2016). Ways of knowing, sharing, and translating agricultural knowledge and perspectives: Alternative epistemologies across non-formal and informal settings. *Journal of Agricultural Education*, *57*(1), 56-72. doi:10.5032/jae.2016.01056

Nunnally, J. (1967) *Psychometric methods*. New York, NY: McGraw-Hill Book Co.

Pearson, E. S., & Tukey, J. W. (1965). Approximate means and standard deviations based on distances between percentage points of frequency curves. *Biometrika,* *52*(3/4), 533. doi:10.2307/2333703

Powell, D., Agnew, D., & Trexler, C. (2008). Agricultural literacy: Clarifying a vision for practical application. *Journal of Agricultural Education*, *49*(1), 85-98. doi:10.5032/jae.2008.01085

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

Rogelberg, S. G. (2008). *Handbook of research methods in industrial and organizational psychology.* Malden, MA: Wiley Interscience

Vallera, F., & Bodzin, A. (2016). Knowledge, skills, or attitudes/beliefs: The contexts of agricultural literacy in upper-elementary science curricula. *Journal of Agricultural Education, 57(*4), 101-117. doi:10.5032/jae.2016.04101

**Perceptions of American Agriculture Before and After   
Viewing the Film *Farmland***

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**Abstract**

*Agricultural knowledge gaps have formed between the nation’s agricultural producers and consumers. Lack of agricultural knowledge and experience, coupled with the presence of unrealistic and negative visual imagery presented through mass media, has generated false representations of the food and fiber industry. This research focused on the impact of entertainment media on consumers’ attitudes of the U.S. agricultural production industry using the documentary film Farmland. The film-makers’ intent was to employ digital storytelling to provide viewers a transparent portrayal of the next generation of U.S. farmers and ranchers. This study applied a survey research method design to gather information about those who attended the viewing. Semantic differential scales were used to assess attitudes before and after the viewing. Results from the study led to the conclusion the film has a positive impact on viewers’ attitudes about agriculture. As such, those interested in influencing attitudes about agriculture should consider using entertainment media to communicate messages about production agriculture.*

**Introduction**

As farm-to-plate knowledge gaps expand and American consumers have reduced firsthand experience with the food and fiber industry, their agricultural literacy knowledge has shifted from firsthand accounts to reliance upon media representations (Specht & Rutherford, 2013). Misrepresentations of the agricultural industry, joined with the general public’s lack of agricultural knowledge, has led consumers to develop negative misunderstandings of America’s modern agricultural production industry (Holt & Cartmell, 2013). The American Association for Agricultural Education noted:

As our global population grows to a projected 9 billion people by 2050, the non-agriculture population has little to no understanding of the complexities involved with sustaining a viable agriculture system. The potential negative impact of an uninformed population on the United States and global agriculture and food systems is great. (Doerfert, 2011, p. 8)

Perceptions and attitudes of the U.S. agricultural industry, especially for young adults, are influenced by family, mass media, and other secondary and tertiary sources due to extreme producer-to-consumer disconnect (Duncan & Broyles, 2006). Transparent communication has been recommended as an effective strategy to bridge the agricultural knowledge divide and create meaningful communication with those in the Millennial generation (Rumble & Irani, 2014.) Agriculturalists, therefore, must work to improve transparent communication and understanding between producers and consumers (Rumble & Irani, 2014).

Entertainment media, new media including advertisements, video clips, documentary films, and reality television, have the ability to impact viewers’ perceptions and attitudes of the food and fiber industry (Holt & Cartmell, 2013; Ruth, Lundy, & Park, 2005; Specht & Beam, 2015). According to Whaley and Tucker (2004), mass media information presented through television visual imagery replaces other sources of information, reinforcing the idea the real world is similar to the world portrayed via television programming. As a result, misrepresentations of the agricultural industry through new media sources such as entertainment, advertisements, and social media, joined with the general public’s lack of agricultural knowledge, has led consumers to develop negative misunderstandings of America’s modern agricultural production industry (Holt & Cartmell, 2013).

In the 19th season of ABC’s popular dating reality show *The Bachelor,* Chris Soules, an Iowa crop and hog farmer, set on a mission to find his future wife. Researchers Specht and Beam (2015) conducted a study to determine if the show impacted audiences’ perceptions and stereotypes of the U.S. agricultural industry. Findings revealed content displayed on the reality television series did create both positive and negative stereotypes of the industry (Specht & Beam, 2015). Additionally, the study highlighted the impact entertainment media has on influencing viewers’ beliefs, attitudes, and behaviors toward agriculture (Adoni & Mane, 1984; Specht & Beam, 2015).

*Farmland*, a 2014 documentary film produced by director James Mole, first appeared in select theaters in 2014 and is readily available to viewers via Netflix. Funded by the United States Farmers and Ranchers Alliance, the film sought to engage the U.S. consumer audience in a conversation and food dialogue centered around modern production agriculture (Moll, 2014). Depicting the “next generation in farming,” the film took viewers’ on a first-hand journey into the lives of six young U.S. farmers and ranchers. Partnering with Discovery Education, the U.S. Farmers and Ranchers Alliance sought to increase the transparency and expand education of the modern U.S. agricultural production industry (Moll, 2014).

Agenda-setting theory is used to describe the media’s ability to set an agenda by increasing the prominence of certain events in viewers’ minds through repeated exposure of the event or increasing the salience of certain events through lack of exposure within the media (McCombs & Shaw, 1993). First developed by Lippman (1922), agenda-setting theory seeks to outline how prominent elements within the media become the important sources of information in our minds.

**Purpose and Objectives**

As the American consumer base becomes further separated from firsthand exposure to production agriculture, the agrarian information divide between producers and consumers continues to expand (Specht et al., 2014). With less than 2% of the United States population directly engaged in the agricultural production industry, the general public has become more powerfully entrusted in mass media as its source for credible information on agricultural issues (Holt & Cartmell, 2013).

Agricultural communicators must be cognizant of and seek to understand the effect entertainment media has on consumers’ perceptions of the agricultural industry (Holt & Cartmell, 2013). Research is needed to further understand how the use of positive agricultural symbolism in film media can impact viewer attitudes of the American food and fiber industry (Holt & Cartmell, 2013). This study seeks to understand if viewers’ perceptions and attitudes of the agricultural production industry are impacted after watching *Farmland*.

The purpose of this study was to determine the immediate effect the film *Farmland* had on viewers’ attitudes about the agricultural industry. Four research objectives guided the researchers on this study:

1. Determine selected characteristics of attendees at a showing of *Farmland*.
2. Describe attendees’ attitudes about agriculture prior to viewing *Farmland*.
3. Describe attendees’ attitudes about agriculture after viewing *Farmland*.
4. Determine if viewing *Farmland* has an impact on attendees’ attitudes about agriculture.

**Procedures**

The population for this study consisted of individuals who attended a viewing of the film *Farmland* on March 29, 2017, on the Oklahoma State University (OSU) campus. The *Farmland* film was offered as a free viewing through the OSU Cineculture Club and co-sponsored by the College of Agricultural Sciences and Natural Resources (CASNR) Student Council in conjunction with its Ag Week. Advertisements were posted throughout the public areas of the university campus, and a social media campaign was used by the sponsoring organizations to entice individuals to attend the viewing. Following the viewing, a questionnaire was administered to the attendees. Of the 70 questionnaires returned, three were found to be incomplete and were removed from the data set, leaving 67 useable responses.

The questionnaire required participants to assess, retrospectively, their attitudes of agriculture prior to viewing of the film and then to assess their attitudes after viewing the film. Per Townsend and Wilton (2003), this then-now approach has proven effective in evaluating social attitudinal data. The instrument was adapted from several existing instruments, including Frick, Birkenholz, and Machtmes, 1995; Holt and Cartmell, 2013; and Anderson-McCoon, Cartmell, and Terry, 2016. The questionnaire consisted of seven demographic questions designed to gather data on attendee’ sex, race, ethnicity, undergraduate major, primary residency, 4-H and FFA experience, and production agriculture experience. Film attendees also were asked if they are/were enrolled in a college-level agricultural class.

To quantify and measure the attitudes of film attendees before and after the viewing of *Farmland*, the survey contained two tables displaying semantic differential scales (Osgood, Suci & Tannenbaum, 1965). Semantic differential scales are a reliable way to measure objectively the semantic properties of words and concepts and objectively measure three attitudinal constructs: evaluative, potency, and activity (Isaac & Michael, 1982). To ensure appropriateness and relevancy to study objectives, only bipolar word pairings related to the evaluative construct were selected and used from the list provided in Osgood et al. (1965).

To ensure reliability of both the instrument and data collection process, a pilot study was conducted in two agricultural communications courses at OSU. A reliability analysis of the pilot study was conducted on the dichotomous terms. The Cronbach’s alpha coefficient for the then table was .84 and a .88 was found for the now table. Following the *Farmland* viewing and data collection*,* a post-hoc reliability analysis was conducted on the bipolar word pairings. The Cronbach’s alpha coefficients were .90 for the then semantic differential and a .84 for the now semantic differential.

For the first objective, data analysis consisted of descriptive statistics, including frequencies and appropriate measures of central tendency. Means and standard deviations were calculated for the evaluative constructs associated with the semantic differential. A paired samples *t* test was used to measure if the change in viewer attitudes of the U.S. agricultural industry was significant. The confidence level for this study was set at α = .05, a priori.

**Findings**

More than half (61.2%, *f* = 41) of the respondents were female. Of the respondents who provided their race, 71.6% (*f* = 48) identified themselves as white, 13.4% (*f* = 9) identified themselves as African Americans, 6.0% (*f* = 4) identified themselves as Native Americans, 4.5% (*f* = 3) indicated they were Asian, and 4.5% (*f* = 3) identified themselves as Hispanic. All of the respondents were current undergraduate students at OSU, with 20.9% (*f* = 14) pursuing a degree offered by the college of agriculture. Fewer than 12.0% (*f* = 8) indicated they lived on a farm, 22.4% (*f* = 15) identified they lived in a rural area, 43.3% (*f* = 29) lived in a city/town, 14.9% (*f* = 10) lived in a suburb area, and 7.5 % (*f* = 5) reported they lived in an urban area. Respondents were asked questions in relation to their agricultural experiences. Of the 67 respondents, 11.9% (*f* = 8) had participated in 4-H, 19.4% (*f* = 13) participated in FFA, 17.9% (*f* = 12) were raised on a farming operation, 41.8% (*f* = 28) reported they had worked on a farming operation, 67.2% (*f* = 45) said they had visited a farming operation, 35.8% (*f* =24) reported they had raised livestock, and 23.9% (*f* = 16) indicated they were/are enrolled in a college level agricultural class.

The second research objective sought to describe the *Farmland* film attendees’ evaluative attitude about the U.S. agricultural industry prior to viewing the film. Eight of the 12 dichotomous pairs had a mode of 7, the most positive response possible. The overall mean for evaluative attitude before viewing the film was 5.46. These data are displayed in Table 1.

Table 1

*Calculated and Summated Means and Standard Deviations for Attitude Scales*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Calculated | |  | Summated | |
| Scales | M | SD |  | *M* | SD |
| Then Attitude | 5.46 | 0.94 |  | 65.48 | 11.26 |
| Now Attitude | 6.05 | 0.74 |  | 72.60 | 8.82 |

The third research objective was designed to evaluate and describe film attendees’ perceptions of the U.S. agricultural industry after viewing Farmland. Eleven of the 12 bipolar word pairings had a modal response of 7, the most positive response possible. The overall mean for evaluative attitude after viewing the film was 6.05. These data are displayed in Table 1.

As shown in Table 2, a paired samples *t* test was conducted to analyze differences in participants’ attitudes before and after viewing the film *Farmland*. Data from the 12 dichotomous word pairs were summed to calculate the mean score for the evaluative attitudinal constructs collected prior to and after viewing *Farmland*. The mean for attendees’ attitudes before viewing the film Farmland was 65.48 with a standard deviation of 11.26. The mean for

Table 2

*Then/Now Paired-Samples t Test Comparing Attitude Scales*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Data Set | *n* | *M* | *SD* | *t* | *p* |
| Summed Then | 67 | 65.48 | 11.26 | ----- | ----- |
| Summed Now | 67 | 72.60 | 8.82 | - 6.479 | .0001 |

df = 66; *α* = 0.05

attendees’ attitudes after viewing the film Farmland was 72.60 with a standard deviation of 8.82. Data analysis revealed a statistically significant difference between the means at the specified .05 level. Cohen’s *d* effect size was calculated to determine the practical significance of the difference as related to the relative magnitude the viewing of the film *Farmland* had on viewers’ attitudes of the agricultural industry (Thalheimer & Cook, 2002). The effect size was 0.51, which is interpreted as a medium effect size according to Thalheimer and Cook (2002).

**Conclusions, Recommendations, and Implications**

The average respondent for this study is a female Caucasian undergraduate student pursuing a non-agricultural degree at OSU. Although she has visited a farming operation, she has limited first-hand agricultural production experience. She was not raised on a farm, nor has she participated in 4-H or FFA or raised livestock. The characteristics described in this conclusion are reflective of the student population at the university. Due to the fact results cannot be generalized, the scope and scale of these conclusions are limited. We recommend this study be replicated across a variety of audiences in educational and non-educational settings.

Overall, respondents’ attitudes of the agricultural industry were positive prior to viewing the film. This conclusion may be impacted by the fact that nearly 12% of the respondents lived on a farming operation (roughly 10% more than the national average). Additionally, the previous agricultural knowledge and agricultural experiences may have impacted attitudes.

The strength of respondents’ positive attitudes about the agricultural industry were more positive after watching the film *Farmland*. As a result, we conclude viewing the film *Farmland* has a positive impact on viewers’ attitudes toward the U.S. agricultural industry. Specht and Rutherford (2013) acknowledged negative agricultural portrayals depicting highly emotional imagery, such as livestock confinement housing or the use of genetically modified crops, can quickly create false representations and stereotypes of the American food and fiber industry. Conversely, the positive advancement in attitudes as a result of the treatment of viewing *Farmland* is supported by other researchers investigating the influence of similar treatments (Anderson-McCoon et al., 2016; Holt & Cartmell, 2013). Furthermore, this conclusion aligns with Ruth et al. (2005), who stated entertainment media has the ability to effect viewers’ perceptions of the agricultural industry. As such, we support the notion agricultural communicators and educators develop programs to engage the public effectively through entertainment media. Further, in an effort to offset negative agricultural representation within mass media, researchers and professionals in the agricultural industry should continue to explore means to communicate transparently to American consumers via entertainment media.

**References**

Adoni, H., & Mane, S. (1984). Media and the social construction of reality: toward an integration of theory and research. *Communication Research, 11*(3), 323-340.

Anderson-McCoon, K., Cartmell, D., & Terry, R. (2016). Fairgoers’ attitudes toward youth livestock exhibits at the California state fair. *Journal of Applied Communications*, *100*(3), 21-31.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159.

Doerfert., D.L. (Ed.). (2011). *National research agenda: American Association of Agricultural Education’s research priority areas for 2011-2015*. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.

Duncan, D. W., & Broyles, T. W. (2006). A comparison of student knowledge and perceptions toward agriculture before and after attending a Governor’s School for Agriculture. *NACTA Journal, 50*(1), 16-21.

Frick, M. J., Birkenholz, R. J., & Machtmes, K. (1995). Rural and urban adult knowledge and perceptions of agriculture. *Journal of Agricultural Education, 36*(2), 44-53.

Holt, J., & Cartmell, D. (2013). Consumer perceptions of the U.S. agricultural industry before and after watching the film. *Food, Inc*. *Journal of Applied Communications*, *97*(3), 47-56.

Isaac, S. & Michael, W.B. (1982). The semantic differential. In Isaac, S. & Michael, W.B., *Handbook in research and evaluation* (pp. 144-148)*.* San Diego: EDITS Publishers.

Lippmann, W. (1922). *Public opinion*. New York: Harcourt, Brace and Company.

McCombs, M. E. and Shaw, D. L. (1993). The evolution of agenda-setting research: Twenty-five years in the marketplace of ideas. *Journal of Communication, 43*(2), 58-67.

Moll, J. (Director). (2014). Farmland [Motion picture]. United States: Allentown Productions.

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1965). The measurement of meaning. Urbana, IL: University of Illinois Press.

Specht, A. R., & Rutherford, T. (2013). Agriculture at eleven: Visual rhetoric and news media portrayals of agriculture. *Journal of Applied Communications*. *97*(4), 96-106.

Specht, A. R., & Beam, B. W. (2015). Prince farming takes a wife: Exploring the use of agricultural imagery and stereotypes on ABC’s *The Bachelor. Journal of Applied Communications. 99*(4), 20-33.

Rumble, J. N., & Irani, T. (2016). Opening the doors to agriculture: the effect of transparent communication on attitude. *Journal of Applied Communications,* *100*(2), 57-72.

Ruth, A. M., Lundy, L. K., & Park, T. D. (2005). Glitz, glamour, and the farm: Portrayal of agriculture as the simple life. *Journal of Applied Communications, 89*(4), 21-37.

Thalheimer, W., & Cook, S. (2002, August). *How to calculate effect sizes from published research articles: A simplified methodology.* Retrieved from http://work- learning.com/effect\_sizes.htm.

Whaley, S. R. & Tucker, M. (2004). The influence of perceived food risk and source trust on media system dependency. *Journal of Applied Communications, 88*(1), 9-27.

**Exploring Precursor Variables Related to Help-Seeking in Online Learning Environments**

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**Abstract**

*Students face numerous challenges in the online courses. The isolation that occurs in this environment impacts students’ ability to seek help. This study sought to determine the relationship between precursor variables and help-seeking in an online dual enrollment course. Relationships between the precursor variables of self-efficacy for learning and performance, goal setting, intrinsic motivation, and task value and help-seeking were statistically significant. Faculty are encouraged to be proactive with students to develop help-seeking skills. Researchers are encouraged to analyze the relationship between student interaction in online and help-seeking.*

**Introduction**

In 2015, 2.8 million post-secondary students were enrolled exclusively in online courses (U.S. Department of Education, 2016). Whether students are enrolled in synchronous, asynchronous, or hybrid courses they face myriad challenges that are unique to the online environment (McInnerney & Roberts, 2004) and to be successful, must be able to regulate their own learning (Swafford, 2017). However, due to the nature of online courses, a communicative disconnect may exist between the student and teacher as well as among other students (Slagter van Tryon & Bishop, 2009). This challenge “can interfere with a behavior that is critical to academic success, help-seeking” (Dunn, Rakes, & Rakes, 2014, p. 75). As Edgar, Retallick, and Jones (2016) suggested in the *American Association for Agricultural Education National Research Agenda: 2016-2020*, students must be engaged in meaningful learning in all environments and therefore, an investigation into this phenomenon is warranted.

Researcher proposed models of help-seeking include multiple stages and decision points that determine how learners address learning and learning difficulties (Gross & McMullen, 1983; Karabenick & Newman, 2009; Nelson-Le Gall, 1981). The models include common elements including, 1) determine whether there is a problem; 2) determine whether help is wanted/needed; 3) decide whether to seek help; 4) decide on the type of help (goal); 5) decide whom to ask; 6) solicit help; 7) obtain help; and 8) process the help received. There is no presumption these events occur in order or that learners are mindful of the steps involved (Karabenick & Dembo, 2011). Karabenick and Dembo (2011) posited the help-seeking process involves a combination of automatic and controlled cognitive processing.

As academic help-seeking is a social act, providing opportunities within the online environment may promote help-seeking. Engaging students in trainable learning behaviors, like self-regulation may influence students’ tendency to seek help (Dunn, Rakes, & Rakes, 2014). Enrollment in online dual credit programs is an opportunity to create environments where students can develop self-regulated skills, which includes help-seeking, needed for future academic success (Chumbley, Haynes, & Hainline, 2015). Students who completed dual credit courses felt better prepared for the post-secondary education (Anderson, 2010; Hughes, 2010).

**Theoretical Framework**

Self-regulated learning is an active process where students set learning goals and then work toward their goals by monitoring, regulating, and controlling their behaviors which are guided and constrained by their goals and the educational environment (Pintrich, 2000). The theoretical framework guiding this study was Zimmerman’s (1998) model of the development of self-regulated learning skills. This model includes three phases including, forethought, performance control, and self-reflection. The forethought phase includes the processes that precede learning and include analysis of the learning task and self-motivation beliefs. Students who are self-motivated prior to learning will be efficacious in their beliefs and have clearly defined individual learning expectations (Zimmerman, 1998). The performance control phase occurs during the learning process. This phase includes the processes of controlling one’s learning and self-observation, including self-experimentation. Self-reflection is the final phase. According to Zimmerman and Schunk (2001), students perform self-evaluation based upon social comparisons and adjust their performance for the next task. The forethought phase the model served as the foundation for the current study.

**Purpose and Objectives**

The purpose of this study was to explore the relationships between selected precursor variables and self-regulated learning behaviors, specifically help-seeking. The specific objectives of the study were to:

1. Describe the help-seeking behaviors among students enrolled in an online agriculture

dual enrollment course.

2. Describe the help-seeking precursor variables of self-efficacy for learning and performance, goal setting, intrinsic motivation, and task value of students enrolled in an online agriculture dual enrollment course.

3. Determine the relationships between the precursor variables and help-seeking behaviors of students enrolled in an online agriculture dual enrollment course.

**Methods**

This study was part of a larger descriptive study and included a census of all secondary students enrolled in an online/hybrid introductory horticulture dual enrollment course (N=153). Students completed all assessments (tests, quizzes, discussion posts, final projects) online and engaged in laboratory activities under the guidance of their secondary agriculture instructor. Data were collected, following procedures outlined by Dillman, Smyth, and Christian (2008) via an online survey platform embedded in a link within the course learning management system. The final response rate was 85%. The study was comprised of slightly more females (57%) than males (43%). Academically, the course included Seniors (44%), Juniors (32%), and Sophomores (24%). Students identified themselves as Native Americans (41%), Caucasian (33%), and Hispanic (26%).

Help-seeking and goal setting were measured using sub-scales of the Online Self-Regulated Learning Questionnaire (OSLQ) (Lan, Bremer, Stevens, & Mullen, 2004). The help-seeking sub-scale included four items and the goal setting sub-scale included five items in a 5-point Likert-type format with response choices ranging from *strongly disagree* (1) to *strongly agree* (5). Self-efficacy for learning and performance, intrinsic motivation, and task value were measured using sub-scales of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, 7 McKeachie, 1991). The self-efficacy sub-scale included eight items, the intrinsic motivation sub-scale included four items, and the task value sub-scale included six items. These sub-scales are in a Likert-type format with a 7-point response format with choices ranging from *not at all true of me* (1) to *very true of me* (7).

**Findings**

Objective one was to describe the help-seeking behaviors among students enrolled in an online agriculture dual enrollment course. Students had an overall help-seeking mean score of 3.36 (*SD*=.57). Table 1 illustrates students’ level of help-seeking in the online agriculture course.

Table 1

Help-Seeking of Online Dual Enrollment Students

|  |  |  |
| --- | --- | --- |
| *Item* | *Mean* | *SD* |
| If needed, I try to meet my classmates face-to-face. | 3.54 | 0.87 |
| I find someone who is knowledgeable in course content so that I can consult with him or her when I need help. | 3.50 | 0.90 |
| I share my problems with my classmates online so we know what we are struggling with and how to solve problems. | 3.33 | 0.90 |
| I am persistent in getting help from the instructor through email. | 3.15 | 0.87 |
| Scale Total: | 3.38 | 0.56 |

*Note.* 5-point scale. 1 = *Strongly Agree*, 2 = *Disagree*, 3 = *Neither Agree nor Disagree*, 4 = *Agree*, 5 = *Strongly Agree*.

Objective two sought to describe the levels of task value, self-efficacy for learning and performance, intrinsic goal orientation, and goal setting of students enrolled in an online agriculture dual enrollment course. It should be noted task value, self-efficacy for learning and performance, and intrinsic goal orientation were measured using a 7-point scale while goal setting was measured using a 5-point scale. Table 2 illustrates students’ mean scores for the precursor variables related to help seeking.

Table 2

*Mean Scores of Precursor Variables Related to Help-Seeking of Online Students*

|  |  |  |
| --- | --- | --- |
| Precursor Variable | *M* | *SD* |
| Task Value | 5.03 | 1.07 |
| Self-Efficacy for Learning and Performance | 4.95 | 1.10 |
| Intrinsic Goal Orientation | 4.87 | 1.03 |
| Goal Setting | 3.65 | 0.66 |

*Note.* Goal Setting, 5-point scale. 1 = *Strongly Agree*, 2 = *Disagree*, 3 = *Neither Agree nor Disagree*, 4 = *Agree*, 5 = *Strongly Agree*. Intrinsic Goal Orientation, Task Value, and Self-Efficacy for Learning and Performance, 7-point scales. 1 = *not at all true of me*, 7 = *very true of me*.

Objective three sought to determine the relationships between help-seeking and the precursor variables task value, self-efficacy for learning and performance, intrinsic goal orientation, and goal setting. Results of a Pearson product-moment correlation yielded substantial (Davis, 1971) associations between help-seeking and precursor variables. These data can be found in Table 3.

Table 3

Correlations among Precursor Variables and Help-Seeking of Online Students

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Self-Efficacy | Intrinsic Motivation | Goal Setting | Task Value |
| Help-Seeking | 0.68 | 0.59 | 0.54 | 0.51 |

*Note*. All correlations were significant at the 0.01 level.

**Conclusions**

Objective one sought to describe the help-seeking behaviors among students enrolled in an online agriculture dual enrollment course. Students in this study were more likely to meet classmates face-to-face or consult with knowledgeable individuals when help was needed. The students met with classmates online to share struggles and develop strategies to solve problems. However, students were least likely seek help from the instructor through email. Cunningham and Billingsley (2003) indicated as students gain experience in the online environment they develop the strategies to acquire the knowledge needed to be successful. As students in this course were secondary students, they may be more likely to seek help from trusted acquaintances rather than the university faculty member with whom they may have never met.

The focus of objective two was to describe the precursor variables related to help-seeking. As help-seeking is a strategy of self-regulated learning (Shunk & Zimmerman, 2008) students must be motivated to learn to develop and incorporate the strategies to aid in their learning. The findings suggest the students in this study were still in the developmental stages of incorporating the strategies to be successful in the online environment. As students gain experience in the online environment, their help-seeking skills will develop and their ability to navigate the challenges inherent to online learning will improve (Shunk & Zimmerman).

Objective three sought to determine the relationships between help-seeking and the selected precursor variables. All precursor variables had substantial relationships with help-seeking. Shunk and Zimmerman (2008) indicated these variables serve as a foundation for developing help-seeking skills. Help-seeking aids students in solving problems, maintain task engagement and interest, and learn (Shunk & Zimmerman, 2008).

**Implications**

In addition to aiding individual students, help-seeking has implications with the classroom environment. Help-seeking has positive effects on teachers’ sense of engagement as it indicates students are interested in their teaching (Shunk & Zimmerman, 2008). As teachers become more engaged with their students, their abilities to assess student learning become more acute and are able to modify teaching plans and methodologies to improve existing teaching strategies. Furthermore, help-seeking behaviors can contribute to a classroom of inquisitiveness, collaboration, and intellectual discourse (Shunk & Zimmerman). Due to the inherent isolationism which can exist in the online environment, promoting help-seeking behaviors can mitigate this issue and encourage students to engage with classmates to discuss and collaborate, which will lead to more knowledge in-depth content acquisition and application.

**Recommendations**

It is recommended that faculty who teach online courses be proactive with students to develop help-seeking skills. Providing students a guide to follow within the course will serve as a foundation for developing the skills needed for success in online courses. As help-seeking is a component of self-regulated learning, including guides for students to follow to improve their self-efficacy in the online environment will increase student engagement and performance (Pintrich & DeGroot, 1990). Additionally, it is recommended that faculty encourage students to provide feedback on course structure and implementation. Feedback will increase student-teacher interaction, which faculty can use to make continuous improvements to online courses.

Goal setting has been linked to self-evaluation in online learning (Chumbley, Haynes, & Hainline, 2015). It is further recommended that faculty include opportunities for students to set course goals. Establishing goals provides students a context to guide future behaviors. Using their goals as a guide, students will be able to analyze their learning which will promote engagement and collaboration with classmates and faculty to address self-identified learning needs and seek help with complex problems.

Faculty and course developers are encouraged to incorporate valuable learning tasks. Problem-based learning strategies have been shown to aid in the development of self-regulated learning skills (Iran-Nejad & Chissom, 1992). Therefore, it is recommended that this teaching method be included in online courses to provide a context where students are required to create their own knowledge, leading to further development of self-regulated learning strategies and thus, improved help-seeking skills.

Researchers are encouraged to analyze the relationship between online course discussion boards and help-seeking. Discussion boards provide an embedded platform for students to engage with peers and faculty by posing questions and comments. As this relationship is assessed, faculty can use resulting data to create more meaningful discussion platforms to engage students and ultimately promote proactive strategies for students to seek help.

**References**

Anderson, J. J. (2010). *An investigation of student perceptions of dual enrollment at a midsized*

*western community college* (Doctoral dissertation). Retrieved from ProQuest

Dissertations & Theses. (3488917)

Chumbley, S., Haynes, J. C., & Hainline, M. (2015, May). Self-regulated learning in an online agriculture course. Proceedings from *the AAAE Western Research Conference*. Corvallis, OR.

Cunningham, C. A., & Billingsley, M. (2003). *Curriculum Webs: A practical guide to weaving the Web into teaching and learning.* Boston: Allyn and Bacon.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2008). *Internet, mail, and mixed-mode surveys: The tailor design method* (3rd ed.). Hoboken, NJ: Wiley

Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice-Hall

*Developmental Review, 1*(3), 224-246.

Dissertations & Theses. (3488917)

Dunn, K. E., Rakes, G. C., & Rakes, T. A. (2014). Help-seeking at a distance: The influence of academic self-regulation, critical thinking, and age on online students’ academic help- seeking. *Distance Education, 35*, 75-89.

Edgar, D. W., Retallick, M. S., & Jones, D. (2016). Research Priority 4: Meaningful, engaged learning in all environments. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020.*

Gainesville, FL: Department of Agricultural Education and Communication.

Gross, A. E., & McMullen, P. A. (1983). Models of help-seeking process. In B. DePaulo, A. Nadler, & J. Fisher (Eds.), *New directions in helping: Vol. 2, Help-seeking*. New York: Academic Press

Hughes, K. L. (2010). Dual enrollment: Postsecondary/secondary partnerships to prepare students. *Journal of College Science Teaching,* 59(6), 12–13.

Iran-Nejad, A., Chissom, B. (1992). Contributions of active and dynamic self-regulation to learning. *Innovative Higher Education*, *17*(2), 125–136. doi: 10.1007/BF00917134

Karabenick, S. A., & Dembo, M. H. (2011). Understanding and facilitating self-regulated help seeking. *New Directions for Teaching and learning, (2011)*126, 33-43.

Karabenick, S. A., & Newman, R. S. (2009). Seeking help: generalizable self-regulatory process and social-cultural barometer. In M. Wosnitza, S. A.Karabenick, A. Efklides, & P. Nenniger (Eds.), *Contemporary motivation research: From global to local perspectives (*p. 25-48). Goettingen, Germany: Hogrefe & Huber.

Lan, W. Y., Bremer, R., Stevens, T., & Mullen, G. (2004). Self-regulated learning in the online environment. *Paper presented at the annual meeting American Educational Research Association*, San Diego, California

McInnerney, J. M., & Roberts, T. S. (2004). Online learning: Social interaction and the creation of a sense of community. *Educational Technology & Society, 7*(3), 73-81.

Nelson-Le Gall, S. (1981). Help-seeking: an understudied problem-solving skill in children.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), Handbook of self-regulation. San Diego, CA: Academic.

Pintrich, P. R., & DeGroot, E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82(*1), 33-40.

Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). A manual for the use of the motivated strategies for learning questionnaire (MSLQ). Ann Arbor, MI: The University of Michigan.

Shunk, D. H., & Zimmerman, B. J. (2008). *Motivation and self-regulated learning: Theory, research, and applications.* New York: Lawrence Erlbaum Associates

Slagter van Tryon, P. J., & Bishop, M. J. (2009). Theoretical foundations for enhancing social connectedness in online learning environments. *Distance Education, 20*(3), 291-315.

Swafford, M. (2017, May 17). *A motivating force behind self-regulated learning. Paper* presented at the American Association for Agricultural Education Conference, San Luis Obispo, CA.

U.S. Department of Education, National Center for Education Statistics. (2016). Digest of Education Statistics, 2015. Washington, D. C.: United States Department of Education.

*western community college* (Doctoral dissertation). Retrieved from ProQuest

Zimmerman, B. J. (1998). Academic studying and the development of personal skill: A self- regulatory perspective. Educational Psychologist, 33(3), 73–86. doi: .1080/00461520.1998.9653292

Zimmerman, B.J., & Schunk, D. H. (2001). Self-regulated learning and academic achievement: Theoretical perspectives(2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

**Crisis Management Preparation of Wisconsin County Fairs**

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*More than three million people attend the Wisconsin county fairs every year attributing $150 million. County fairs, like many other tourist events have inherent risk for crisis. To aid in proper crisis management, county fairs need to develop and implement a crisis management plan. A descriptive research design that collected multiple forms of data was used in the study to investigate the crisis preparation and management of Wisconsin county fairs. The quantitative data collection included interviews of county fair leaders and an evaluation of their county’s crisis management plan and related artifacts. It was found that most Wisconsin county fairs have a crisis plan of some form they utilize during fair events. The plans that the fairs have in place attempt to follow the Mitroff’s Five-Stage Model for Crisis Management but there is much work they have to do to create an all-inclusive crisis management plan for the fairs to be better prepared. Although, further research is needed on this topic, this study laid the groundwork for improving the preparation and management of county fair crisis events.*

# Introduction/Conceptual Framework

An agricultural county fair is a competition for the best agricultural and domestic products of a county, region, or state (International Association of Fairs and Expositions, n.d.). Fairs are an annual celebration for the community to come together to share and to learn agriculture (International Association of Fairs and Expositions, n.d.). The primary focus of the early modern day county fairs in the United States were to serve as a showcase of the talents of the youth of the community by providing a means of education, exhibit, and competition of the various livestock and non-livestock projects the youth are involved in (Marsden, 2010). This philosophy is still considered the backbone of today’s county fair. Approximately 150 million people each year seek out the county fair experience by attending the more than 3,200 agricultural fairs that are held throughout the United States (McIntosh, 2007).

As times have changed, so has the purpose of the county fair. Today the county fair is viewed more as a celebration of the traditions America’s agriculture past instead of an opportunity to educate farmers of modern agricultural innovations (McIntosh, 2007). This change is due to county fairs attempting to appeal to a much larger audience of fairgoers who may never visit one of the many animal displays or exhibitions (McIntosh, 2007). Counties will also use their fair to highlight the heritage of the community and its ties to agriculture, industry, and businesses that are the backbone of the community (Marsden, 2010). The pull of participatory and direct experience and learning that fair participants get continues to bring people to the county fair year after year (Marsden, 2010).

County fairs and other large social events that promote tourism and public participation have an inherent risk for crises to occur (Tarlow, 2002). A crisis can be defined as the perception of an unpredictable event that threatens important expectancies of stakeholders related to health, safety, environmental, and economic issues and can seriously impact an organization’s performance and generate negative outcomes (Coombs, 2015). If a crisis should occur at an event like a county fair, the event and organization sponsoring it is often unable to rebound from the incident as quickly as a traditional organization could since much of the attraction to the event is based on the image it has (Tarlow, 2002). A poorly handled crisis can place a poor image in the mind of a fair attendee and possibly prevent them from attending that county fair and other county fairs in the future.

To aid in crisis management, an organization should create and implement a Crisis Management Plan (CMP) or Crisis Communication Plan (Coombs, 2015). A CMP is a communication document that does not list step-by-step how to handle crisis situations but does provides information on how and whom to contact and procedures for certain policies to aid in the event of a crisis including how to document the event, how to address the media, and the contact information for those who can aid in a crisis (Coombs, 2015). One perspective of crisis management planning is the life cycle process which focuses on the idea that crisis management is an ongoing process (Coombs, 2015). Coombs (2015) stated, Mitroff’s five-phase Model for Crisis Management divides crisis management into five different stages: signal detection, probing and prevention, damage containment, recovery, and learning (Figure 1).

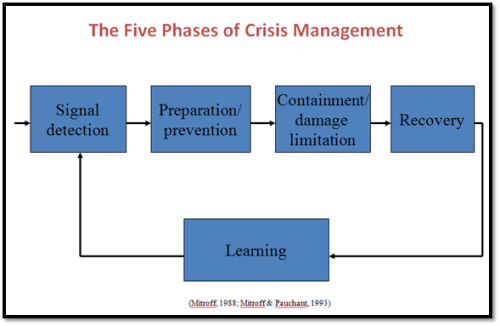


Figure 1: Mitroff's Five Phases of Crisis Management (Mitroff & Pauchant, 1990)

# Purpose

The purpose of this descriptive study was to examine the crisis preparation and the crisis management plans of Wisconsin county fairs. The following research objectives were used:

1. Evaluate the crisis management plans of Wisconsin county fairs’ according to the CrisComScore Crisis Communication Scorecard.
2. Evaluate the differences and similarities of Wisconsin county fairs implementation of crisis communication plans during a crisis.
3. Evaluate the similarities and differences between crisis events that have occurred at Wisconsin county fairs.

# Methods/Procedures

This descriptive study collected data through qualitative interviews and a quantitative evaluation tool. The population frame for this study was the 76 state-aided district and county fairs in the state of Wisconsin. This study sought to generalize the crisis management preparations of county fairs through evaluating their crisis management plans. A sample of 20 counties was selected through simple random sampling from the contact list of the Wisconsin Association of Fairs website. The final respondent pool was nine.

To collect data for objective one, the participating county fairs’ crisis management plans were analyzed utilizing the CrisComScore Crisis Communication Scorecard evaluation tool (CrisComScore, 2010) to provide a fuller description of the effectiveness of the crisis management plans through the evaluation of data (Sandelowski, 2000). The phases listed in the instrument are preparation, warning, crisis response, reconstruction, and evaluation aligning with Mitroff’s five phase model (Figure 1). Each question in each phase evaluates the crisis management plan using a six-point scale (0 – 5; 0 = *Do not know, or this indicator is not relevancy for our organization*; 5 = *This is fully a systematic part of action*). Seven of the nine responding fairs had created and utilized crisis management tools for their county fair events and allowed the researcher to evaluate their crisis management documents. To determine the internal consistency of the study’s quantitative instrument Cronbach’s alpha was utilized (Heale & Twycross, 2015). Since each of the phases used for evaluation are independent from each other in their question development, five Cronbach’s alpha were calculated to examine the reliability of each section of the instrument. The resulting section Cronbach’s alpha scores ranged from .82 -.94 creating confidence that the instrument was reliable.

The data collection method for objectives two and three were semi-structured interviews using a 10-question, researcher developed interview guide developed from Mitroff’s five stage model for crisis management (Coombs, 2015). Semi-structured interviews were specifically utilized in this study because they allow for a selected set of questions to be asked, but also allow the researcher to ask follow-up questions or modify the questions during the interview (Ary, Jacobs, Sorensen, & Walker, 2014). The semi-structured interviews for this study were conducted through face-to-face and telephone interviews. Face-to-face interviews focus on the interviewer reading the questions to the participant and recording their responses while telephone interviews have shown to compare quite favorably to personal interviews in the past 50 years (Ary, Jacobs, Sorensen, & Walker, 2014). To aid in the data analysis, the interviews were digitally recorded and field notes were taken by the researcher. The researcher also collected any artifacts that pertained to their fair’s crisis preparation and management including signs, photos, crisis communication plans, crisis management plans, emergency plans, evacuation plans etc. After each interview, the researcher transcribed the recordings verbatim to utilize when comparing the data during data analysis. During the data analysis process, all descriptive factors of the sample fairs were removed from the transcriptions and data analysis. The researcher first utilized open coding when analyzing the data to break apart and delineate concepts to stand for blocks of raw data. After these concepts were created from the open coding through the use of memos, the researcher then utilized axial coding by relating concepts found in the data to each other to determine if there are overarching themes found in the data (Corbin & Strauss, 2008). In quantitative research, it is important to consider if the data collected is valid and reliable (Ary, Jacobs, Sorensen, & Walker, 2014). The researcher considered credibility, transferability, dependability, and confirmability to ensure trustworthiness in the qualitative procedure.

# Findings

## Research Objective One

All nine participating fairs in the study had a crisis management or emergency plan in place. Of the nine participants, seven allowed the researcher to evaluate their plan using the CrisComScore Crisis Communication Scorecard. With results reflecting Mitroff’s Five-Stage Model for crisis management (signal detection, probing and prevention, damage containment, recovery, and learning; Coombs, 2015), only two of the nine county fairs were effective in the use of signal detection, probing and prevention, and damage containment for proper crisis management. For the remaining two stages (reconstruction /recovery and learning) resulting evaluation scores indicated that the county fairs either do not have this plan of their plan or did not think to add these areas in their crisis communication plans. Specifically, the analysis found fairs met the baseline for an effective plans in the areas of: (a) different means of communication are used to educate and instruct people how to be prepared for various types of risk (*M =* 3.00); (b) the responsibilities and tasks of communication experts in relation to response management in the organization and within the response network are laid out (*M =* 3.86); (c) agreements are made regarding coordination in the network of response organizations, including responsibilities for communication (*M =* 3.00); and (d) communication plans and strategies for various crisis scenarios are developed within individual organizations as well as with other participants in the response network (*M =* 3.29). The plans also included: (a) local organizations are stimulated to draw up their own crisis communication plans and exercises (*M =* 3.43); (b) the pooling of communication expertise is arranged and there is enough manpower for each communication task (*M =* 4.29); and (c) knowledge of the responsibilities of other parties’ persons to be contacted procedures and means for the exchange of information is established (*M =* 3.71). The phase one analysis also identified where the plans were the weakest. These areas are: (a) media coverage of risk information is stimulated throughout the year (*M =* 1.14); (b) training for communication expertise and skills is offered for communication offers and response managers (*M =* 1.43); (c) crisis exercises emphasizing communication are conducted regularly (*M =* 1.43); (d) studies are arranged to analyze risk perception and the information needs of public groups (*M =* 1.57); and (e) media coverage on risk is followed and analyzed (*M =* 1.57).

## Research Objective Two

The during face-to-face and telephone interviews results illustrated a variance in the confidence levels of crisis preparation for the county fairs as well as management techniques. When asked what objects, processes, or tools do they utilize to *help prepare the staff* for a possible crisis event, staff trainings, public announcements over a fair wide public announcement system, crisis plan documents, two-way radios, use of emergency response team members (Police, Sheriff’s department, EMS, and Fire station), and the use of signs were all used to aid county fair staff members before a crisis. When asked participants what objects, processes or tools they have in place *visible to fair attendees at all times*, signs range from informational materials to promote people to wash their hands after being by the animals to prevent E. coli, directions to a safer shelter during sever weather, or to evacuate the fair grounds. As for those objects, processes or tools they have in place that are *not visible* to fair attendees at all times but become visible during an emergency (e.g. flashing warning lights, volunteers to help with crowd management, the resulting categories that were formed were the emergence of emergency management team members (police, sheriff’s department, fire, and EMS/first aid), PA system prepared announcements, and back-up emergency utilities such as flash lights and generators.

## Research Objective Three

When asked *what types of crises* their fair had faced, the list of crisis included: protests, animal escape, food related illness, animal disease, mechanical break downs, power outage, crime, missing people, natural crisis, facility failures, attendee health issue requiring EMS response, and ethical violations (bribes of judges, illegal switching of animals, drug use in animals) with animal escape, missing peoples, and natural crisis such as a flood or tornado, and attendee health issues requiring EMS being the most common between the fairs. Seven of the nine fairs named the *most challenging crisis* they have faced as severe weather which can come at a moment’s notice and cause quick planning to take place by the fair staff. As for the *most common crisis*, a lost child (also called this crisis a “lost parent” because most of the cases it is the child who is coming to the office) followed by severe weather, medical assistance, and parking issues.

# Conclusions

Overall, the study found that Wisconsin county fairs need to implement better crisis management plans overall. While the researcher found that the participants had some form of crisis plan, it was found that five of the seven plans that were evaluated were implementing emergency response documents not crisis management documents and that a majority of the plans that the county fairs were utilizing were not up to the standard of what proper crisis management must possess. While evaluating the questions focusing on similarities and differences of actions of crisis management that county fairs make during crises, it was found that most county fairs have a similar interpretation of how prepared they are for a crisis of any kinds. County fairs also showed their similarities when it came to the tools and ways county fairs prepare their staff for a crisis through staff trainings they put on. Most of the fairs stated that informational/educational signs were the most used way to inform their public during a crisis. The fairs agreed again on what aspects for crisis management are brought out during a crisis that would normally not be seen. Seven of the county fairs participants stated that the emergency management teams would take over in the incident of a large crisis and would normally not be visible until a crisis occurs illustrating the county fair relies heavily on outside resources to aid in the crisis management. It also shows when the participants think of a crisis they tend to think of incidents that are large enough to need the emergency response team.

The research found that the most challenging crises the participants believe they face were severe weather. For a Wisconsin county fair, severe weather comes in the form of sever heat, extreme rains, hail, and tornadoes. In some situations of severe weather, the devastation can be so great that the damage is caused by the event can be too great to overcome in a single day. Knowing this it is important for county fairs to plan for severe weather events that are common during the summer months. The results revealed the most common crisis most participating fairs have faced is lost children/parents. Some fairs even stated that this crisis occurs at least once a day during the duration of their fair week. A lost child proves to be an outside stakeholder being the child and or the parent’s threatening the fair event by causing a search for the child or parent. This takes man power and time that take those resources away from other aspects of the events that they would otherwise be at. This crisis also shows threat to the organization if the lost child was due to kidnapping that is a direct example of how an outside entity is affecting the image and effectiveness of the organization through a criminal act. It was also interesting to find that the most challenging crisis of severe weather was not high on the list of most common crises that take place at the county fairs. It was also found that the most common crisis of a lost child was not considered to be very high on the list of challenging crises that fairs have faced. These findings bring out an idea that do fairs find crisis that they do not see it very often such as severe weather challenging because they do not occur very often. That being said, do they find a lost child crisis to be unchallenging because it is so common.

# Recommendations/Discussion

In Wisconsin and arguably every other state, each fair should create and be prepared to fully implement a crisis management plan to use during their events and use Mitroff’s five-phase model for crisis management to develop this plan. Plans using this model will be better prepared for every stage in crisis management and will also aid in the reputation management of the county fair. This plan should also include information on how to handle media in crisis management plans and have a spokesperson designated and trained on how to handle the media to aid in the proper representation of the situation and the organization during a crisis. When creating a crisis management plan, county fairs should also include plans for what they consider to be the most challenging and common crises that they face to ensure that the fair can be prepared for the crisis. The Wisconsin Fair Association should consider crisis management training for all counties—potentially held during their annual meeting. Recommendations for future research include a risk assessment of county fairs to aid in the development of what risks county fairs realistically face as well as a detailed analysis of past fair-based crisis events. These assessments can be a great resource to start forming objectives of study on the topic of fair crisis management.

**References**

Ary, D., Jacobs, L. C., Sorensen, C. K., & Walker, D. A. (2014). *Introduction to research in education* (9th ed.). Belmont, CA: Wadsworth Cengage Learning.

Coombs. W. T. (2015). *Ongoing crisis communication planning, managing, and responding*. Thousand Oaks, CA: SAGE Publishing /Inc.

Corbin, J. M. & Strauss, A. (2008). *Basics of qualitative research* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

CrisComScore (2010). *Crisis Communication Scorecard*. Retrieved from <http://www.crisiscommunication.fi/criscomscore/>

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence Based Nursing*, *18*(3), 66-67. doi:10.1136/eb-2015-102129

International Association of Fairs and Expositions.(n.d). *History of fairs*. Retrieved from https://www.fairsandexpos.com/eweb/DynamicPage.aspx?Site=IAFE&WebCode=History-

Marsden, T. M. (2010). The county fair as celebration and cultural text. *The Journal of American Culture, 33*(1), 24-29.

McIntosh, P. (2007). State and county fairs: Family fun across the USA*. The National Teaching & Learning Forum*, *3*, 35-44. doi:10.1002/(issn)2166-3327

Mitroff, I. I. (1988). Crisis management: Cutting through the confusion. *Sloan Management Review*, *29*(2), 15-20.

Mitroff, I. I., & Pauchant, T. C. (1990). *We're so big and powerful nothing bad can happen to us: An investigation of America's crisis prone corporations*. Birch Lane Pr.

Tarlow, P. E. (2002). *Event risk management and safety*. New York, NY: Wiley.

**A Needs Assessment of Experiential Educator Skills for Student Teachers Before, During, and After Their Student Teaching Experience**

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**Abstract**

*Agricultural educators often refer to themselves as experiential, but struggle to describe what skills are associated with that designation. The purpose of this descriptive longitudinal panel study was to determine the experiential educator skill needs of student teachers during different stages of their student teaching experience. Skills were derived from the Educator Role Profile (Kolb, Kolb, Passerelli, & Sharma, 2014; ERP) and then modified to fit the context of agricultural education. Using the Borich (1980) needs assessment protocol, specific needs during various stage of the student teaching process were identified. It is recommended that teacher educators make clear the skills that are associated with teaching experientially, assess those skills, and provide skill-specific training when most appropriate.*

**Introduction/ Theoretical Framework**

In agricultural education, the student teaching experience is relied heavily on to teach the skills needed to be successful both in and out of the classroom (Borne & Moss, 1990; Byler & Byler, 1984; Edwards & Briers, 2001; Krysher, Robinson, Montgomery, Edwards, 2012; Schumann, 1969). Student teaching varies in time and design depending on institution but should include the four levels of coursework as outlined by Whittington (2005). A quality student teaching experience should allow student teachers to transition through three stages of development: orientation, participation and maturation (Schuman, 1969). This critical portion of teacher education shapes perceptions and attitudes as well as provides opportunities for growth (Edgar, Roberts, & Murphy, 2009; Grossman, Hammerness & McDonald, 2009; Schumann, 1969; Smalley, Retallick & Paulsen, 2015; Stripling, Ricketts, Roberts & Harlin, 2008; Young & Edwards, 2006). Researchers in agricultural education identified the following knowledge and skills as necessary to learn during student teaching: (a) pedagogy, (b) laboratory instruction, (c) guidance, and (d) coaching within SAE and FFA (Blackburn, Robinson, & Field, 2015; Edwards & Briers, 2001; Krysher et al., 2012). Several researchers found student teachers believed the student teaching experience improved their curriculum development, instructional delivery and planning application skills (Smalley et al., 2015; Stripling et al., 2008; Young and Edwards, 2006). Baker, Robinson & Kolb (2012) expressed the need for teacher education programs to “prepare teachers to serve as coaches, facilitators, subject experts and standard setters while teaching experientially in both formal and non-formal settings” (p.12). Teacher education programs need to focus on instruction of pedagogical skills that will prepare teachers to be successful (Briers & Byler, 1974; Chong & Cheah, 2010; Flanders, 1963; Goodwin et al., 2014; Hollins, 2011; Ingersoll, 2012; Scheeler, 2007, Smalley et al., 2015; Touchstone, 2015; “U.S. Department”, 2015). In agricultural education, this means training teachers to facilitate experiential learning (Knobloch, 2003; Millenbah & Millspaugh, 2003; Roberts, 2006). Agricultural education instructors need to be able to successfully lead students through the full experiential cycle (Baker et al., 2012; Dewey, 1938; Svinicki & Dixon, 1987).

This study is framed by Kolb’s (2015) Experiential Learning Theory (ELT) and Kolb, Kolb, Passarelli and Sharma’s (2014) Educator Role Profile (ERP). The ERP framework is based on the experiential learning theory that describes the process an educator needs to properly facilitate experiential learning with their students (Kolb, et al., 2014). To successfully complete the experientially learning theory cycle, students need their educator to facilitate the four modes of learning (Baker, et al., 2012). Educator roles need to be interchangeable for the whole ELT process to successfully occur (Kolb, 2015). These roles include: Facilitator, Subject Expert, Standard Setter/ Evaluator and Coach (Kolb, et al., 2014). Taking on each role is imperative because “each educator role engages students to learn in a unique manner, using one mode of grasping experience and one mode of transforming experience” (Kolb, 2015, p. 306).

**Purpose/ Objectives**

The purpose of this study was to determine the experiential educator skill needs of student teachers during different stages of their student teaching experience. This study was guided by one research objective: Identify the needs for experiential educator skills for student teachers prior, during and after the student teaching experience.

**Methods/ Procedures**

This study utilized a descriptive longitudinal panel survey design (Duncan, Juster, & Morgan, 1986; Johnson & Christensen, 2014). The population of interest in this study was agricultural education student teachers at universities in Oklahoma and Texas who were engaged in their student teaching experience during the Spring of 2016 (*N* = 164). A convenience sample (*n* = 91) was taken from four representative universities that have agricultural education teacher preparation programs. For a participant’s data to be useable, all administrations must have been completed. Seventy-seven students completed the pre-administration. The mid-administration was completed by fifty-five student teachers. The post-administration was completed by forty-four student teachers. Due to attrition and incomplete response, thirty-six complete participants’ responses were used in the study for a 39.6% response rate.

The ERP (Kolb et al., 2014) was adapted for this study to measure skills related to the four roles of experiential teaching by rewording the 60 original items from the instrument into skills based statements. Each skill was evaluated using the Borich (1980) Needs Assessment structure. Borich (1980) described the needs assessment model as “a self-evaluative procedure which relies on teachers’ judgments. about their own performance” (p. 42). This structure has been previously adapted for use in assessing the employability skills of agricultural college graduates (Radhaskrishna & Bruening, 1994; Robinson, Garton and Vaughn, 2007) but has yet to focus on teacher preparation in agricultural education. Each student teachers’ perception of how important each skill was measured on a scale of one to four where 1 indicated the skill had no importance, 2 indicated minor importance, 3 indicated moderate importance and 4 indicated the skill had major importance. Each student teacher’s perceptions of their competence of the skills also was measured. A response of 1 indicated that they were not competent in the skill, 2 indicated minor competence, three indicated moderate competence and a response of four indicated they were very competent in that skill. Cronbach alphas were calculated for each construct for both importance and competence in each administration and ranged between .786 and .949, surpassing the .70 threshold (Field, 2014). As suggested by Borich (1980), discrepancy scores were calculated by subtracting perceived importance from perceived competence. A mean weighted discrepancy score (MWDS) was calculated by dividing the sum of all discrepancy scores for each skill by the number of responses. The needs assessment structure required assigning a rank for each skill during each administration and arranging the skills based in order of need. A grand weighted mean discrepancy score was calculated for each needs assessment by utilizing the descriptive statistic function.

**Results/Findings**

Table 1displays the skills in order of most needed to least needed for the pre-administration. For brevity only the top 15 skills were included. In the pre-administration, student teacher’s identified a greater need for evaluator and coaching skills. The GMWDS for the pre-administration was 1.33. 33.3% of the top fifteen skills were in the evaluator role including the top three: “create a challenging environment for quality work” (MWDS= 2.08, rank=1); “prepare learners for jobs and careers” (MWDS= 2.06, rank=2); and “advise learners about the performance requirements of their career” (MWDS= 2.00, rank=3). 33.3% of the top fifteen skills were also in the coaching role with the highest coaching skill being, “help learners achieve personal goals” (MWDS= 1.89 rank=4). Student teacher’s identified little need for expert skills. 66.7% of the bottom fifteen skills were in the expert role including three of the final four: “encourage learners to read the literature about a subject critically” (MWDS= 0.81, rank= 57); “teach methods for critical analysis of ideas” (MWDS= 0.78, rank= 58); and “communicate with learners on an intellectual level” (MWDS= 0.67, rank= 59). The final skill identified in the pre-administration needs assessment was the evaluator skill “focus on performance outcomes” (MWD*S*= 0.61, rank= 60).

Table 1

*Pre- Administration Needs Assessment*

|  |  |  |  |
| --- | --- | --- | --- |
| Rank | Skill | Role | *MWDS* |
| 1. | Create a challenging environment for quality work | Evaluator | 2.08 |
| 2. | Prepare learners for jobs and careers | Evaluator | 2.06 |
| 3. | Advise learners about the performance requirements of career | Evaluator | 2.00 |
| 4. | Communicate my subject matter expertise | Expert | 1.97 |
| 5. | Help learners achieve personal goals | Coach | 1.89 |
| 6. | Aim for learners to develop a lifelong love of learning | Facilitator | 1.86 |
| 7. | Develop learner’s problem solving skills | Evaluator | 1.86 |
| 8. | Take a subject matter expert role with learners | Expert | 1.83 |
| 9. | Encourage learners to create alternative solutions | Facilitator | 1.83 |
| 10. | Develop ability to apply learning | Coach | 1.81 |
| 11. | Develop learners’ skill in using the required materials | Evaluator | 1.72 |
| 12. | Use field projects | Coach | 1.69 |
| 13. | Deliver learning in real life context | Coach | 1.61 |
| 14. | Help learners apply what they have learned | Coach | 1.58 |
| 15. | Develop learners’ understanding of their values | Facilitator | 1.56 |

*Table 2* displays the skills in order of most needed to least needed for the mid-administration. Student teacher’s identified a greater need for facilitator and evaluator skills. The GMWD*S* for the pre-administration was 1.21. 46.7% of the top fifteen skills were in the facilitator role including two of the top three: “aim for learners to develop a lifelong love of learning” (MWDS= 2.08, rank=1); and “help learners develop a concern about social issues” (MWDS= 1.81, rank=3). 33.3% of the top fifteen skills were also in the evaluator role with the highest evaluator skill being, “advise learners about the performance requirements of their career” (MWDS= 1.89 rank=2). Again, student teacher’s identified little need for expert skills. 46.7% of the bottom fifteen skills were in the expert role including the final skill with the lowest MWDS: “design an educational program around the basic principles” (MWDS= 0.53, rank= 60). 33.3% of the bottom fifteen skills were in the evaluator role including the 59th ranked skill: “focus on performance outcomes” (MWDS= 0.61, rank= 59). No facilitator skills were ranked the bottom fifteen skills

Table 2

*Mid-Administration Needs Assessment*

|  |  |  |  |
| --- | --- | --- | --- |
| Rank | Skill | Role | *MWDS* |
| 1. | Aim for learners to develop a lifelong love of learning | Facilitator | 2.08 |
| 2. | Advise learners about the performance requirements of their career | Evaluator | 1.81 |
| 3. | Help learners develop a concern about social issues | Facilitator | 1.75 |
| 4. | Develop learner’s problem solving skills | Evaluator | 1.69 |
| 5. | Develop learners’ understanding of their values | Facilitator | 1.64 |
| 6. | Use group discussion for learners to reflect | Facilitator | 1.61 |
| 7. | Create a challenging environment for quality work | Evaluator | 1.58 |
| 8. | Use field projects | Coach | 1.50 |
| 9. | Encourage learners to create alternative solutions | Facilitator | 1.50 |
| 10. | Create a challenging environment | Evaluator | 1.44 |
| 11. | Develop learners’ understanding of others’ points of view | Facilitator | 1.44 |
| 12. | Prepare learners for jobs and careers | Evaluator | 1.44 |
| 13. | Model by demonstration how an expert thinks about a topic | Expert | 1.44 |
| 14. | Emphasize application in real world | Coach | 1.42 |
| 15. | Design an educational program around the learner's interests | Facilitator | 1.42 |

*Table 3* displays the skills in order of most needed to least needed for the post-administration. Student teacher’s identified a greater need for evaluator and coaching skills. The *GMWDS* for the post-administration was 0.53. 33.3% of the top fifteen skills were in the evaluator role including two of the top three: “create a challenging environment” (MWDS= 1.34, rank=1); and “outline step-by-step procedures for solving problems” (MWDS= 1.06, rank=3). Additionally, 33.3% of the top fifteen skills were also in the coaching role with the highest coaching skill being, “emphasize application in real world” (MWDS= 1.06 rank=2). Student teacher’s identified a low need for some skills in the evaluator, expert and facilitator roles. 33.3% of the bottom fifteen skills were in the evaluator role including, “set standards and evaluate” (MWDS= 0.14, rank= 60). The expert role made up 26.7% of the bottom fifteen skills which included, “am logical in my teaching design” (MWDS= 0.22, rank= 58). The facilitator role also composed 26.7% of the bottom fifteen skills including the skill with the lowest MWDS*,* “show learners that I am a caring person” (MWDS= 0.14, rank= 60).

Table 3

*Post-Administration Needs Assessment*

|  |  |  |  |
| --- | --- | --- | --- |
| Rank | Skill | Role | *MWDS* |
| 1. | Create a challenging environment | Evaluator | 1.34 |
| 2. | Emphasize application in real world | Coach | 1.06 |
| 3. | Outline step-by-step procedures for solving problems | Evaluator | 1.06 |
| 4. | Aim for learners to develop a lifelong love of learning | Facilitator | 1.00 |
| 5. | Communicate my subject matter expertise | Expert | 0.97 |
| 6. | Question learners about their understanding of a concept | Expert | 0.97 |
| 7. | Establish standards and criteria for student performance | Evaluator | 0.86 |
| 8. | Develop learner’s skill in planning and organizing | Coach | 0.86 |
| 9. | Encourage learners to pursue development of interests | Facilitator | 0.83 |
| 10. | Provide opportunities for practice and feedback | Coach | 0.81 |
| 11. | Develop ability to apply learning | Coach | 0.81 |
| 12. | Develop learner’s problem solving skills | Evaluator | 0.78 |
| 13. | Teach methods for critical analysis of ideas | Expert | 0.78 |
| 14. | Prepare learners for jobs and careers | Evaluator | 0.78 |
| 15. | Use field projects | Coach | 0.75 |

**Conclusions/Implications**

This study found that student teachers identified a need for different skills and roles at distinctive times during their student teaching experience. Each needs assessment displayed the skills, most of which were different than the previous needs assessment, that student teachers identified the greatest need for during that stage of their student teaching experience. Kolb’s (2015) experiential learning theory supports the notion that necessities are determined by circumstance and level of growth. If student teachers are growing, their needs should change to reflect these developments. Previous literature also supports this conclusion. Wittington (2005) found teacher preparation should be approached as a process where different needs are addressed throughout a preservice teachers’ education. Perhaps this approach should be included in the seminar needs of student teachers as well. Schuman (1969) also found student teaching to be a maturation process that requires altered support throughout. Perhaps as student teachers mature, the need for support in bridging the gaps between importance and competence for specific skills also changes. One major implication arises from this conclusion. First, if student teachers are not receiving support and feedback on their growth in experiential educator skills, their needs for certain skills may never be met. Some skills in the top 25% remained in this area of high need because the student teacher never perceived that they bridged this gap. Could this occur less frequently if more intentional support was provided throughout the student teaching experience in the form of seminars and in-services?

Recommendations for praxis include encouraging teacher preparation programs to provide support for the needs of their student teaching cohort throughout the student teaching experience. The use of seminars or in-service opportunities should directly reflect the needs of the cohort. Further research should explore the effectiveness of addressing indicated needs on discrepancy scores and should explore the experiential educator needs of active teachers both at the early and late professional stages.

**References**

Baker, M. A., Robinson, J. S. & Kolb, D. A. (2012). Aligning Kolb’s experiential learning theory with a comprehensive agricultural education model. *Journal of Agricultural Education,* *53*(4), 1-16. doi:10.5032/jae.2012.04001

Blackburn, J. J., Robinson, J. S., & Field, H. (2015). Preservice agriculture teachers’ perceived level of readiness in an agricultural mechanics course. *Journal of Agricultural Education, 56*(1), 172-187. Doi:10.5032/jae.2015.01172

Borich, G. (1980) A Needs Assessment Model for Conducting Follow-up Studies. *Journal of Teacher Education, 31*(1), pp. 3942.

Borne, C., & Moss, J.W. (1990). Satisfaction with agricultural education student teaching. *Journal of Agricultural Education*, *36*(2), 29-34. doi:10.5032/jae.1990.02029

Briers, G. E. & Byler, B. L. (1974). Morale of student teachers in agricultural education at Iowa State University. *Journal of Agricultural Education*, *20*(3), 41-54. doi:10.5032/jaatea.1979.03041

Byler, B. L., & Byler, L. F. (1984). Analysis of student teacher morale before and after student teaching. *Journal of Agricultural Education, 25*(3), 22-28. doi:10.5032/jaatea.1984.03022

Chong, S. and Cheah, H.M. (2010). A Values, Skills and Knowledge Framework for Intial Teacher Preparation Programmes. *Australian Journal of Teacher Education, 34*(3), 1-17.

Dewey, J. (1938). *Experience and education*. New York, NY: The Macmillan Company.

Duncan, G. J., Juster, F. T., & Morgan, J. N. (1986). The role of panel studies in a world of scarce research resources. In *Survey research designs: towards a better understanding of their costs and benefits* (pp. 94-129). Springer US.

Edgar, D. W., Roberts, T. G., & Murphy, T. H. (2009). Structured communication: Effects on teaching efficacy of student teachers. *Journal of Agricultural Education, 50*(1), 33-44. doi:10.5032/jae.2009.01033

Edwards, M. C., Briers, G. E. (2001). Cooperating teachers’ perceptions of important elements of the student teaching experience: a focus group approach with quantitative follow-up. *Journal of Agricultural Education,* *42*(3), 30-41. doi: 10.5032/jae.2001.03030

Field, A. (2013). Discovering statistics using IBM SPSS Statistics (4th ed.). Thousand Oaks, CA: Sage Publications, Inc.

Flanders, N. A. (1963). Intent, action and feedback: A preparation for teaching. *Journal of Teacher Education, 14*(3), 251-260.

Goodwin, A. L., Smith, L., Souto-Manning, M., Cheruvu, R., Tan, M. Y., Reed, R., & Taveras, L. (2014). What should teacher educators know and be able to do? Perspectives from practicing teacher educators. *Journal of Teacher Education,* *65*(4), 284-302.

Grossman, P., Hammerness, K., & McDonald, M. (2009). Redefining teaching, re-imagining teacher education. *Teachers and Teaching: Theory and Practice, 15*(2), 273-289.

Hollins, E. R. (2011). Teacher preparation for quality teaching. *Journal of Teacher Education,* *62*(4), 395-407.

Ingersoll, R. M. (2012). Beginning teacher induction what the data tell us. *Phi Delta Kappan*, *93*(8), 47-51.

Knobloch, N. A. (2003). Is experiential learning authentic? *Journal of Agricultural Education,* *44*(4), 22-34. doi:10.5032/jae.2003.04022

Kolb, A. Y., Kolb, D. A., Passarelli, A., & Sharma, G. (2014). On becoming an experiential educator: The educator role profile. *Simulation & Gaming, 45*(2), 204-234. doi:10.1177/1046878114534383

Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development.* Upper Saddle River, NJ: Pearson Education, Inc.

Krysher, S., Robinson, J. S., Montgomery, D., & Edwards, M. C. (2012). Perceptions of teaching ability during the student teaching experience in agricultural education. *Journal of Agricultural Education, 53*(4), 29. doi:10.5032/jae.2012.04029

Millenbah, K. F. & Millspaugh, J. J. (2003). Using experiential learning in wildlife courses to improve retention, problem solving, and decision-making. *Wildlife Society Bulletin*, 127-137. Retrieved from http://www.jstor.org/stable/3784366

Radhakrishna, R. B., & Bruening, T. H. (1994). Pennsylvania study: Employee and student perceptions of skills and experiences needed for careers in agribusiness. *NACTA Journal, 38*(1), 15-18.

Roberts, T. G. (2006). A philosophical examination of experiential learning theory for agricultural educators. *Journal of Agricultural Education, 47*(1), 17-29. doi: 10.5032/jae.2006.01017

Robinson, J. S., Garton, B. L., & Vaughn, P. R. (2007). Becoming employable: A look at graduates’ and supervisors’ perceptions of the skills needed for employability. *NACTA Journal*, *51*(2), 19-26.

Scheeler, M. C. (2008). Generalizing effective teaching skills: The missing link in teacher preparation. *Journal of Behavioral Education*, *17*(2), 145-159.

Schumann, H. B. (1969). The cooperating teacher’s role in student teaching. *The Agricultural Education Magazine, 41*(7), 156.

Smalley, S. W., Retallick, M. S., Paulesen, T. H. (2015). Relevance of student teaching skills and activities from the perspective of the student teacher. *Journal of Agricultural Education, 56*(1), 73-91. doi:10.5032/jae.2015.01073

Stripling, C., Ricketts, J. C., Roberts, T. G., Harlin, J. F. (2008). Preservice agricultural education teachers’ sense of teaching self-efficacy. *Journal of Agricultural Education, 49*(4), 120-130. doi: 10.5032/jae.2008.04120

Svinicki, M. D. & Dixon, N. M. (1987). The Kolb model modified for classroom activities. *College Teaching*, *35*(4), 141-146.

Touchstone, A. J. L. (2015). Professional development needs of beginning agricultural education teachers in Idaho. *Journal of Agricultural Education, 56* (2), 170-187. doi:10.5032/jae.2015.02170

U.S. Department of Education. (2015). U.S. department of education approves 16 state’s plans to provide equal access to excellent educators [Press release]. Retrieved from http://www.ed.gov/news/press-releases/us-department-education-approves-16-states-plans-provide-equal-access-excellent-educators

Whittington, M. S. (2005). The presidential address to the Association for Career and Technical Education Research: Using standards to reform teacher preparation in career and technical education: A successful reformation. *Career and Technical Education Research*, *30*(2), 89–99.

Young, R. B. & Edwards, M. C. (2006). A comparison of student teachers’ perceptions of important elements of the student teaching experience before and after a 12-week field experience. *Journal of Agricultural Education, 47*(3), 45-57, doi:10.5032/jae.2006.0304

**Identification of Priorities for an Agricultural Sciences and Natural Resources Unit at a Land Grant University**

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**Abstract**

*Land-grant institutions have a long history of developing human capacity, the economy, and society. Current funding and policy issues on state and federal levels, however, have created a need for higher education leaders to identify and communicate their future priorities. Due to the dynamic nature of the agricultural industry and future projected shortages in college graduates to fill positions in all the industry, this need is particularly important for higher education programs in agriculture. After determining drivers of change and goals, leaders in the Division of Agricultural Sciences and Natural Resources (DASNR) at Oklahoma State University engaged stakeholders to identify priorities in the areas of teaching, research, and outreach. The Delphi technique was used to achieve a convergence of opinion regarding priorities for DASNR among selected agricultural leaders in the state. A three-round process yielded agreement with 22 items. Items reaching concensus aligned with the three vital roles land-grant institutions identified by APLU. In response to this study’s findings, DASNR should focus more effort on developing human capital through teaching and research. Additionally, Extension programs should focus upon updated approaches to disseminating research, increase emphasis upon youth development, and promote key issues related to agriculture and natural resources.*

**Introduction**

Public higher education institutions in America have a rich history in building human capacity, growing the economy, and providing social stability for our nation (APLU, 2017). Land grant institutions, in particular, have played an important role in our nation by providing educational programs, creating innovation and research, and engaging with individuals and groups beyond their campuses (APLU, 2017). However, these institutions face a litany of challenges to maintain or enhace these important contributions to our culture and society.

The American Association of State Colleges and Universities (AASCU, 2017) shared a list of issues for higher education in 2017. The top issue was funding amid shrinking state budgets, followed by affordability of educational programs, workforce and economic development, and institutional productivity. Berdahl, Altbach, and Gumport (2011) stated the relationships between higher education institutions and entities external to them is complex, involving social, political and economic factors. They pointed out states already burdended with costs for common education, prison systems, and health care, are challenged to provide sufficient support for higher education. Consequently, leaders of college and universities must be able to articulate the value and future directions of their programs.

Strategic program planning is used to determine future directions of organizations (Goodstein, Nolan, & Pfeiffer, 1992). Delbecq and Van De Ven (1971) described a five phase approach to strategic program planning. The first step is Problem Exploration and the last is Program Evaluation. In between, the Knowledge Exploration and Priority Development phases, involve attaining input from inviduals representing external organizations and scientific fields (Delbecq & Van De Ven, 1971).

As he was completing his tenure as Vice President, Dean and Director of the Division of Agricultural Sciences and Natural Resources (DASNR) at Oklahoma State University (OSU), Dr. Robert Whitson led a project to identify drivers of change and goals for the division to be shared with policy makers and key stakeholders (DASNR Vision Statement, n.d.). Building on that initial work, a project was initiated to identify priorities for DASNR to further clarify future directions of the institution.

The agricultural industry is changing rapidly (Huffman, 2000). To determine the drivers of change, it is important to consider the human capital, including skills, competencies, experiences, future employees will need in various career fields. Human capital is the investment a person makes in his or her education, skills, training, and experiences to be competent in and prepared for the workforce (Becker, 1975; Schultz, 1961). Chief among them is education (Huffman, 2000). Therefore, aligning education to meet the needs of the ever changing agricultural industry is of paramount importance.

The interest in studying the relationships between universities and employment sectors and how graduates are being prepared to enter the world of work is perhaps greater today than any other time before (Teichler, 2007). However, due to its mission of providing education to the common man, land-grant insitutions have always had an obligation to improve the human capital necessary for its graduates’ employability and success in the workplace (Davis & Nolan, 2001).

Since its inception, land-grant institutions have attempted “to provide scientific and technical-institute types of training in an appeal to the interests of farmers, merchants, and manufacturers” (Bowman, 1962, p. 524) by striving to “serve the people–and … be active about it” (p. 527). Because human capital varies from one profession to another, it is considered sector-specific (Neal, 1995; Smith, 2010), and must be examined within each discipline so that educational programs might be offered to improve the efficiency and relevance for students seeking employability (Klees, 2016).

**Purpose of the Study**

The purpose and objective of this study was to describe the perceptions of a select group of agricultural professionals regarding the future priorities of the DASNR at OSU.

**Methodology**

The Delphi technique is designed as a group communication process, which aims to achieve a convergence of opinion on a specific real-world issue (Hsu & Sandford, 2007). The approach uses multiple iterations of questionnaires until consensus among a panel of experts is established (Custer, Scarcella, & Stewart, 1999). The panelists consisted of current and former members of the Dean’s Advisory Committee and agricultural industry leaders and producers (*N* = 74). These individuals have been recognized for their expertise across various sectors of the agricultural industry in Oklahoma.

A three round, modified Delphi was employed to seek consensus on future priorities for DASNR. Qualtrics® was utilized to facilitate data collection, in the initial round, the question, “Considering the Land Grant mission inclusive of teaching, research and extension, what should be the future priorities for DASNR?” was posed to the expert panel. Two additional rounds were used to seek consensus on the items identified as a result of round one. In the second-round, panelists were asked to rate their level of agreement using a six-point scale and if necessary, re-write items as presented if they believed additional clarity was needed. Items that achieved 75% agreement or higher (i.e., Agree or Strongly Agree) were retained as those reaching consensus. However, items that did not achieve 75% agreement but more than 51% were sent back to the experts in round three. Round two also provided an opportunity for panelists to add additional items that may have been missed in round one. The third and final round sought to refine consensus on items that reached more than 51% but less than 75% agreement in round two.

**Results/Findings**

Thirty-six panelists participated in the first round of the data gathering process, yielding a 49% response rate. This initial step of the study generated 120 items. Upon analysis of those items, 34 unduplicated statements were included in the second round instrument. Twenty-seven panelists (75% response rate) reached consensus on 18 of the 34 items. Five items did not reach consensus and were removed from the study and 11 items moved forward to the third round. The final round utilized eleven panelists (41% response rate) to review the 11 items included in the third round. Four additional items reached consensus at this point and were added to the priorities identified in the second round. In all, the panel of experts reached consensus of agreement on 22 items regarding the future priorities of DASNR (see Table 1).

Each of the priorities identified by the expert panel was associated closely with one or more components of the land grant mission. The four items with the highest level of concensus focused on the academic and character development of students in the College of Agricultural Sciences and Natural Resources (CASNR) or pre-collegiate youth involved in 4-H and/or FFA programs.

The priorites aligned with several of the DASNR goals identified in 2011. The CASNR goals to “Provide high quality educational programs that will attract, retain, and graduate both undergraduate and graduate students from diverse backgrounds and levels of exposure to agricultural and natural resource settings” and “Increase opportunities for student leadership training, experience, and research and service activities through sustained excellence of faculty advisement and mentorship” connected with several priorities. Each of the goals for OAES and OCES connected to one or more of the priorities that emerged.

Table 1

*Items that Reached Consensus of Agreement after Three Rounds (N = 22)*

|  |  |
| --- | --- |
| Item | Percent Agreement |
| Develop students’ employability/life skills (i.e., communication, critical thinking, organization, and problem solving) | 100.00 |
| Prepare students for careers in all areas of the agricultural sciences | 100.00 |
| Improve conservation practices. | 100.00 |
| Develop the leadership abilities (i.e., goal setting, group dynamics, and conducting meetings) of pre-collegiate youth (i.e., 4-H & FFA members). | 96.30 |
| Develop students’ leadership abilities (i.e., goal setting, group dynamics, and conducting meetings). | 96.30 |
| Disseminate results of agricultural research to producers. | 96.29 |
| Deliver Extension programs using current and future technology. | 96.15 |
| Research new agricultural technology to increase food and fiber production. | 96.15 |
| Adapt Extension programs to societal and cultural changes. | 90.91 |
| Prepare agricultural teachers/FFA Advisors for school-based agricultural education programs. | 90.91 |
| Prepare students to be production agricultural entrepreneurs. | 90.91 |
| Conduct applied research to increase food and fiber production. | 88.46 |
| Communicate benefits of agricultural research. | 88.46 |
| Develop students’ agricultural skills and competencies in the areas of plant and soil science, agricultural power and technology, animal science, food science, agribusiness, and natural resources and environmental science. | 84.62 |
| Connect teaching and research programs to agricultural producers. | 84.62 |
| Promote food safety. | 84.61 |
| Improve agricultural plant species. | 80.77 |
| Promote efficient use of water. | 80.77 |
| Disseminate results of agricultural research to the public. | 80.77 |
| Research efficient use of water. | 80.77 |
| Develop the employability/life skills (i.e., communication, critical thinking, and organizational problem solving) of pre-collegiate youth (i.e., 4-H & FFA members). | 77.78 |
| Teach environmental stewardship. | 76.93 |

**Conclusions, Discussion, and Implications**

APLU purported universities and post-secondary institutions play three vital roles in development: (a) the development of human capital through education and training, (b) research and innovation, and (c) engagement in regional and local policy and practice (APLU, 2017). The items reaching concensus aligned with these purposes. Specifically, eight priorities aligned with development of human capital, five focusing on research and development, and three focusing on the influence of policy and practice primarily through extension.

Key agricultural stakeholders placed a priority on the need for social science in DASNR at OSU. Social science priorities were focused on either the development of human capital through university teaching or moving research and development to praxis through community education and extension. Two of the three items receiving 100% concensus were related to the development of human capital in undergraduate students. Three items receiving 96.29% and 90.91% concensus focused on the dissemination of results to society, delivering extension programs to advance technology, and the adaption of extension to meet societal shifts. Congruent to the call made by AASCU (2017), stakeholders focused on productivity and student success as priorities for DASNR. This priority also matches the purpose of land-grant institutions as made by Bowman (1962). If social sciences related to human capital and innovation diffusion are key priorities, DASNR should consider the funding, utilization, and importance of the social sciences. Do the faculty appointments within DASNR align with these priorities?

Research and innovation related to food, fiber, and natural resources was a priority reaching concensus, but was not the main focus of the panelists. Research priority items, with the exception of improving conservation practices, did not reach 100% consensus. Though these priorities were important, they were secondary to the development of human capital both formally and informally. Panelists seemed more focused on the dissemination and use of the research than the production of research. Again, this conclusion aligns with the call for impact put forth by the the AASCU (2017). The research priorities were primarily focused on production agriculture. Absent from the consensus items related to research is a specific focus on the life sciences such as microbiology, agricultural economics, and social science research. Although research is valued, the focus seems to be on production and conservation practices. Perhaps this highlights the need for those sciences not directly included in the priority list to educate the public on the role of their research lines in addressing grand agricultural challenges.

Panelists considered functions associated with Extension to be a priority; however, there were also calls for this component of the land grant mission to adapt to current societal and cultural norms. Stakeholders clearly place a priority on focusing the research and development done at OSU to the citizens of Oklahoma. However, there is also a call for a renewed mission and purpose. Perhaps the eight items reflecting priorities of policy and practice highlight potential focus areas for the extension efforts at OSU. Consensus from this group would focus extension work on youth development through 4-H, dissemination of research, training and education, food safety, and efficient use of water. These priorities call for a shift of the extension mission to dissemination of research, youth development, and the promotion of key issues related to food, fiber, and natural resources.

**References**

American Association of State Colleges and Universities. (2017, January). *Top 10 higher education state policy issues for 2017.* http://www.aascu.org/policy/publications/policy-matters/Top10Issues2017.pdf

Association of Public & Land-Grant Universities. (n.d.). *Why higher education?* Retrived from http://www.aplu.org/projects-and-initiatives/international-programs/knowledge-center-for-advancing-development-through-higher-education/why-higher-education.html

Becker, G. S. (1975). *Human capital: A theoretical and empirical analysis with special reference to education* (3rd ed.). Chicago, IL: University of Chicago Press.

Berdahl, R. O., Altbach, P. G., & Gmport, P. J. (2011). The contexts of American higher education. In Albach et al. (Eds), *American higher education in the Twenty-First Century: Social, political, and ecomomic challenges* (3rd ed.). Baltimore, MD: The Johns Hopkins University Press.

Bowman, M. J. (1962). The land-grant colleges and universities in human-resource development. *The Journal of Economic History, 22*(4), 523–546.

Custer, R. L., Scarcella, J. A., & Stewart, B. R. (1999). The modified Delphi technique: A rotational modification. *Journal of Vocational and Technical Education, 15* (2), 1–10.

Davis, H. D., & Noland, B. E. (2001). Understanding human capital through multiple disciplines: Tennessee’s educational needs index. *Proceedings of the Annual Meeting of the Association of Institutional Research, Long Beach, CA*.

Delbecq, A.L. & Van De Ven, A.H. (1971). A group process for problem identification and program planning. *The Journal of Applied Behavioral Science, 7*(4), 446–492.

Division of Agricultural Sciences and Natural Resources. (n.d.) *Vision and future priority directions and goals of DASNR: FY 2012-2010*. Retrieved from http://www.dasnr.okstate.edu/

Goodstein, L. D., Nolan, T. M., & Pfeiffer, J. W. (1992). *Applied strategic planning*. San Diego, CA: Pfeiffer & Company.

Hsu, C., & Sandford, B. A. (2007). The Delphi technique: Making sense of consensus. *Practical Assessment Research & Evaluation, 12*(10). 1–7.

Huffman, W. E. (2000). *Human capital, education, and agriculture*. Paper for Plenary Session III 24th International Congress of Agricultural Economists. Berlin, Germany.

Klees, S. J. (2016). Human capital rates of return: Brilliant ideas of ideological dead ends? *Comparative Education Review, 60*(4), 644–672.

Neal, D. (1995). Industry-specific human capital: Evidence from displaced workers. *Journal of Labor Economics, 13*(4), 653–677.

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51*(1), 1–17.

Smith, E. (2010). Sector-specific human capital and the distribution of earnings. *Journal of Human Capital, 4*(1), 35–61.

Teichler, U. (2007). Does higher education matter? Lessons from a comparative graduate study. *European Journal of Education Reserearch, Development and Policy, 42*(1), 11–34. doi:10.1111/j.1465-3435.2007.00287.x

**Students’ Perceptions of Inquiry-based Learning   
in the High School Agriculture Classroom**

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**Abstract**

*Inquiry-based learning is not new. In fact, reference to current use of inquiry as a teaching strategy traces to Comenius (1592-1670) and Dewey (1859-1952), among others. Incorporating inquiry-based instruction into the agriculture classroom brings with it many challenges for both teachers and learners. Numerous studies examine teachers’ perceptions of inquiry-based instruction. However, only limited research has investigated perceptions of high school students in the agriculture classroom. The purpose of this study was to document perceptions of high school students transitioning to and using inquiry-based instruction in their agriculture classes. The objectives were as follows: (a) examine students’ definitions of inquiry-based learning; (b) describe students’ perceptions of the effectiveness of inquiry-based learning; and (c) describe students’ perceptions of the impact of inquiry-based learning on critical thinking skills. Findings revealed that students enjoyed inquiry-based learning opportunities and recognized the benefits associated with the method.*

**Introduction**

Inquiry-based learning is not new. In fact, reference to current use of inquiry as a teaching strategy traces to Comenius (1592-1670) and Dewey (1859-1952), among others. Scientific inquiry, according to the National Research Council (1996),

“refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Inquiry also refers to the activities of students in which they develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world” (p. 23).

Further, an inquiry-based learning opportunity is described as

“a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations” (National Research Council, 1996, p. 23).

The inquiry-based approach to instruction has been reported as valuable but accompanied with challenges (Edelson, Gordin, & Pea, 1999). In fact, the way in which inquiry-based learning is disseminated and implemented impacts learning (Maab & Artigue, 2013). Minner, Levy, and Century (2009) synthesized 138 different studies which used inquiry-based learning and found that inquiry-based learning had a positive effect on the learning of content, retention of content, and the conceptual understanding of students. An additional study found that teachers who received training in inquiry-based instruction reported that although the teachers and students struggled at the beginning of implementing the approach into the agriculture classroom, once the students got used to the method they reported learning more than with other teaching strategies (Blythe, DiBendetto, & Myers, 2015).

Incorporating inquiry-based instruction into the agricultural classroom brings with it many challenges for both teachers and learners. Numerous studies examine teachers’ perceptions of inquiry-based instruction and its benefits. Studies have documented that with proper training, agricultural teachers have a positive attitude towards utilizing inquiry-based instruction (Thoron, Myers, & Abrams, 2011). However, only limited research has investigated perceptions of agricultural students regarding impact of inquiry-based methods on educational growth. As the push to implement more science into the agricultural classroom continues, it is important to investigate the best method for teaching these strategies to students. Knowing students’ perceptions about how they learn most efficiently can allow for improvement of the educational experience. This study addressed the need for research related to meaningful, engaged learning in all environments, Research Priority Four of the American Association for Agricultural Education National Research Agenda 2016-2020 (Roberts, Harder, & Brashears, 2016).

**Purpose and Objectives**

The purpose of this study was to determine perceptions of high school students transitioning to and using inquiry-based instruction in their agriculture classes. The objectives were as follows: (a) determine students’ definitions of inquiry-based learning; (b) describe students’ perceptions of the effectiveness of inquiry-based learning; and (c) describe students’ perceptions of the impact of inquiry-based learning on critical thinking.

**Theoretical Framework**

The theoretical framework was based upon literature related to the inquiry-based learning approach. Inquiry-based learning is rooted in the theory of constructivism. In science classrooms, constructivism is a prominent form of learning where students interpret experiences in order to discover meaning and develop understanding (Palmer, 2005). Teaching strategies based on constructivism provide students with experiences, which allow them to develop their own knowledge schemes. Learners involved in inquiry-based learning construct their own mental representation of material, selecting relevant information, and interpreting gathered information based on existing knowledge (Shuell, 1993), which is the basis of constructivism.

**Methodology**

This study utilized qualitative methods following a standardized, open-interview format (Patton, 2002). Initial sampling consisted of a purposive sample of 67 students enrolled in agricultural classes at a large 6A New Mexico High School utilizing inquiry-based learning. The agricultural classes included animal science, horticulture, and career development. Out of the 67 students, 24 students returned parental consent and minor consent forms, which qualified them to participate in an interview per institutional review board guidelines. Each student was interviewed individually during the school day at a time convenient for the student and lasted approximately four to ten minutes depending on how much information the student selected to share. There were six questions included in the interview protocol. As each student answered the questions, detailed notes were taken and these notes were transcribed immediately following completion of the interview. Member checking was accomplished through student review of information transcribed to ensure accurate communication of his/her thoughts. The first question asked students to describe inquiry-based learning in their own words. If students were unsure of the definition of inquiry-based learning, a description and examples of inquiry-based learning opportunities were provided in order to ensure the answers to the remaining questions were based on inquiry-based learning opportunities and not some other type of learning opportunity. Each student was assigned a code based on the order they were interviewed (P01 … P24), the courses completed (H=Horticulture; A=Animal Science; C=Career Development), grade level (10=sophomore; 11=junior; 12=senior), and gender (M=male; F=female). (For example, Person One was a student in tenth grade, who had completed the horticulture course, and was male: P01-10HM.) Codes were used within interview notes as the constant-comparative method allowed themes to emerge. Further, the researcher maintained a reflection log to allow triangulation of data through analysis of transcribed notes, the reflection log, and researcher observations.

Students in the purposive sample had been involved in inquiry-based learning opportunities over the eight-month period leading up to the study. The inquiry-based learning opportunities utilized the “Essential Features of Classroom Inquiry and their Variations” guidelines provided by the National Research Council (2000). The following features were included in each inquiry-based learning opportunity: (a) learner engages in scientifically oriented question; (b) learner gives priority to evidence in responding to questions; (c) learner formulates explanations from evidence; (d) learner connects explanations to scientific knowledge; and (e) learner communicates and justifies explanations. Depending on the inquiry-based opportunity, each of these five features varied from self-directed to teacher-driven based on the needs of the class.

**Results**

Twenty-four students were interviewed as a part of the study: 13 females and 11 males. Sixteen of the students were enrolled in animal science (A), four were enrolled in horticulture (H), three students were enrolled in career development (C) and one student was enrolled in both animal science and horticulture (AH). The grade levels of the students interviewed were 12 sophomores, 10 juniors, and one senior.

**Objective 1: Students’ Definition of Inquiry-based Learning**

When students were asked to describe inquiry-based learning there were four themes that emerged. Six (P01-10HM, P02-10HM, P04-10AF, P06-10AF, P19-11AF, P26-10HM) referred to the process as “hands on,” four (P03-11CM, P05-11AHM, P12-11CF, P20-11AF) indicated that the method required working by yourself, and two (P09-10HM, P23-12CF) indicated that inquiry-based learning involved questions. Half of the students (12 students) were not sure how to describe inquiry-based learning, even though all students had inquiry-based learning described to them at the beginning of the school year. Once students were provided an example of an inquiry-based learning opportunity that they had participated in, they then indicated an understanding of inquiry-based learning. Those students who described inquiry-based learning as “hands on” did not mention anything about having to find, explain, and justify data as part of the process, but believed it was any activity where they were engaged in the process through some type of experience or project. Students whose answers were categorized as “work by yourself” described inquiry-based learning as an opportunity to learn things by yourself instead of being instructed directly by a teacher. The two students who described inquiry-based learning as learning by asking questions and finding answers correctly described an essential aspect of inquiry-based learning.

**Objective 2: Students’ Perceptions of the Effectiveness of Inquiry-Based Methods**

Students’ answers as to what was most beneficial about inquiry-based learning opportunities emerged as six themes: learn by yourself, gain knowledge, different, an experience, use prior knowledge, and entertaining. One response as to why it is beneficial was, “You don’t get used to the teacher giving you the answer, you get to find the answer by yourself” (P13-10AF). Another student stated, “helps your mind process, learning on your own improves understanding” (P14-10AM). One explained what was most beneficial by providing the following example, “I never knew who or what the pope was even though people kept telling me, until I researched it for myself, now I know” (P23-12CF). Several students felt inquiry-based learning opportunities were beneficial because it increased your knowledge, learning, and retention. Some responses were “makes you use your mind more” (P12-11CF), “gets you prepared for harder questions” (P08-10AF), and “test scores are higher, [I] comprehend, [and] know what [the] answer is” (P10-10AF). Other responses as to why it was beneficial included “more entertaining than lecture” (P19-11AF) and “I am more interactive in the activity, results are based off of me” (P26-10HM); indicating the students felt it was beneficial because it was entertaining and engaging. One student felt the most beneficial aspect was because it “allows everyone to learn the same thing, but in different ways” (P06-10AF).

Most of the students interviewed chose to explain what they liked most about inquiry-based learning, with only a few students discussing what they liked least. Themes related to what they like most included: learn by yourself (seven students), variation (four students), hands on (two students), makes you think harder (two students), learn new things (one student), research (one student), discussion (one student), quicker (one student), and challenge (one student). Students expressed that they like the fact that inquiry-based learning opportunities allowed them to learn things on their own instead of being given all the information by the teacher. One student liked that “you get to question yourself, see what you already know” (P15-11AF). Other things students liked most about inquiry-based learning opportunities was the variation, that it is usually hands on, and you get to conduct research. One student mentioned the communication part of inquiry-based learning opportunities stating, “I like you can discuss with classmates, not just get the answer” (P13-10AF). The same aspects that many students liked most about inquiry-based learning opportunities were what other students liked least. Themes related to what they like least included: hard to find information (two students), hard to get started (one student), and have to think harder (one student).

Students were asked their opinion regarding how background information should be provided in the context of inquiry-based learning. The interviews revealed that half of the students preferred to receive background information before the inquiry-based learning opportunity, while half of the students preferred that they receive the information after they had completed the inquiry-based learning opportunity. Even though students repeatedly in other questions stated that learning by yourself increased critical thinking skills and was beneficial, many still wanted to receive background information prior to implementation of the inquiry-based method. One student recognized that getting the background information first would alter the inquiry approach stating, “Connections after because if given before it is not really inquiry, you already know how to do it” (P03-11CM). One student felt that receiving background information first would make it easier because “we will use the information given” (P28-10AF).

Students were asked if there were any technologies that could be used to make the inquiry-based method more enjoyable. Since students in the sample already utilize computers when completing inquiry-based learning, many students (10) indicated that they did not think utilizing additional technologies would make the learning process more engaging/fun. Those students who thought adding computers or cell phones would make the inquiry more engaging/fun wanted the technologies to be used to incorporate some type of game into the inquiry-based learning opportunity. One student stated, “Teenagers now are addicted to technology – allowing them to use technology will [allow them to] enjoy more” (P24-11AM). Some students thought the use of technologies would not be a good idea stating, “none, they [students] would just use them for other things, getting off task” (P13-10AF) and “none, that would make it easier” (P03-11CM).

**Objective 3: Students’ Perceptions of Impact on Critical Thinking Skills**

When asked if students felt that inquiry-based learning opportunities improved their critical thinking skills, all students answered yes. The ways in which students felt it improved their critical thinking skills varied. Themes included: learn by yourself (13 students), think harder (four students), because you are doing (three students), problem solving (two students), remember better (one student), learn more (one student). Most of the students felt that inquiry-based learning opportunities improved their critical thinking skills because they were required to find the answers on their own. One student’s response was, “It gives you a better opportunity to do things on your own and the opportunity to think about what the answer is on your own” (P13-10AF). Another response was, “We are made to think why things happen instead of being told what happens” (P09-10HM). Students also felt that their critical thinking improved because they were able to problem solve, remember the material better, and learn more.

**Discussion and Recommendations**

These findings suggest that students who have been exposed to inquiry-based learning opportunities recognize the benefits. Akpullukcu and Gunay (2015) found that students’ favorite parts of inquiry-based learning were related to designing, application, and decision process. Similarly, all students in this study felt that inquiry-based learning opportunities improved their critical thinking skills. Adding inquiry-based learning opportunities to agricultural classrooms might benefit students by improving their critical thinking skills and their ability to work autonomously. Inquiry-based learning in agriculture classrooms might also assist in student retention. If we can capture the essence of how students are reacting to the use of inquiry-based learning, we can develop more effective strategies for agriculture teachers to implement inquiry-based learning. Experimental studies are recommended to examine the impact related to learning, engagement, and retention when inquiry-based learning opportunities are implemented.

**References**

Akpullukcu, S., & Gunay, F. Y. (2015) A case study on students perceptions and views about inquiry based learning environments. *Journal of Science and Arts, 15*(1-2)*,* 5-19.

Blythe, J. M., DiBenedetto, C. A., &, Myers, B. E. (2015). Inquiry-based instruction: Perceptions of national agriscience teacher ambassadors. *Journal of Agricultural Education, 56*(2), 110-121. doi: 10.5032/jae.2015.02110

Edelson, D. C., Gordin, D. N., & Pea, R. D. (1999). Addressing the challenges of inquiry-based learning through technology and curriculum design. *Journal of the Learning Sciences*, *8*(3-4), 391-450.

Maab, K., & Artigue, M. (2013). Implementation of inquiry-based learning in day-to-day teaching: A synthesis. *ZDM Mathematics Education*, *45*(6), 779-795. doi: 10.1007/s11858-13-0528-0

Minner, D. D., Levey, A. J., & Century, J. (2009). Inquiry-based science instruction—What is it and does it matter? Results from a research synthesis years 1984 to 2002. *Journal of Research in Science Teaching, 47*(4), 474-496.

National Research Council. (1996). *National science education standards.* Washington, DC: National Academy Press.

National Research Council. (2000). *Inquiry and the National Science Education Standards: A guide for teaching and learning.* Washington, DC: National Academy Press.

Palmer, D. (2005). A motivational view of constructivist-informed teaching. *International Journal of Science Education, 27*(15), 1853-1881.

Patton, M. Q. (2002). *Qualitative research and evaluation methods, 3rd ed*. London: Sage Publications.

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Shuell, T.J. (1993). Toward an integrated theory of teaching and learning. *Educational Psychologist, 28*(4), 291-311.

Thoron, A., Myers, B., & Abrams, K. (2011). Inquiry-based instruction: How is it utilized, accepted, and assessed in schools with national agriscience teacher ambassadors? *Journal of Agricultural Education, 52*(1), 96-106. doi:10.5032/jae.2011.01096

**USDA Agricultural Checkoff Programs’ YouTube Presence and Video Quality**

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**Abstract**

*YouTube has existed since 2005. Since that time, many marketing professionals have used the site to combine sight, sound, motion, and emotion to appeal to a target audience. Agricultural research and promotion, or checkoff programs, are no different, and many have used YouTube’s platform to reach consumers. This study analyzed half of the USDA-overseen commodity checkoff programs’ YouTube presence for views, subscribers, likes, and number of videos, as well as the visual framing of video categories, visual framing of most popular videos, presence of semiotic portrayals regarding rural life and agriculture of most popular videos, quality of the YouTube homepage and overall quality of videos. One group had more than 18 million views of the videos the researchers analyzed. All of the groups in the sample received above a four on a five point, researcher created, Likert-type scale to measure video quality. Data indicate that higher quality garners higher viewership.*

**Introduction**

American agriculture industries are constantly discovering and utilizing effective communications methods to address public concerns and promote their brand in competing markets. As the increasing amount of online information makes it difficult to reach individuals, Agrawal (2016) suggested that marketers must promote their brand in ways that are proven to resonate with the public. Visuals are powerful tools in reaching individuals as they provide the highest level of reader digestibility and retention (Rodriguez & Dimitrova, 2011).

Agricultural research and promotion programs (R&P) or checkoff programs, are quasi-governmental programs that are funded through producer assessments. Overseen by the United States Department of Agriculture, they provide a voice for the commodity they represent (USDA, n.d.). R&P programs attempt to “develop new markets, strengthen existing markets, and conduct important research and promotion activities” for the commodities that have a checkoff (USDA, n.d., para. 1). The nationally recognized slogan, “Beef. It’s What’s For Dinner,” is one example of a tagline crafted by the Beef Checkoff program. Through campaigns or other communications strategies, R&P programs are charged with building public interest in the commodity to increase demand and communicate the uses of the product (Findley, 2007). These checkoff programs have engaged their target audiences through traditional advertising, trade shows, social media, and other methods to get consumers to purchase more of that specific product (Moore, 2012).

Research supports utilizing visuals to increase engagement and reach (Rodriguez & Dimitrova, 2011; Belk & Kozinets, 2005). Videos have been credited as one of the most powerful tools for creating a strong impression of an organization (Brown, 2005). Videos incorporate verbal, vocal, and visual components of communication to create a personable and strong impression of an organization (Waters & Jones, 2011). Rotman and Pierce (2010) found that individuals find the visual nature of videos more personal. Videos are simple to watch and retain, and have been reported as a cheaper alternative to other marketing methods (Belk & Kozinets, 2012).

Although organizations can post videos on their own websites, visitor traffic is highest through social media outlets (Waters & Jones, 2011). As the second largest search network after Google, YouTube has an extensive audience reach (Johnson, 2017). A strong YouTube presence is an important communication and marketing strategy (Agrawal, 2016), and researchers have seen an increase in adults using YouTube for educational purposes (Waters & Jones, 2011). YouTube can be beneficial to a marketing plan in three ways: it creates an image of authority, it builds credibility and trust, and is more engaging than other forms of media (Agrawal, 2016).

Messages are framed or visually framed in ways to resonate with the desired audience (Nisbet, 2009; Rodriguez & Dimitrova, 2011). The USDA checkoff programs are at the frontline of communicating about the commodity they serve (USDA, n.d.). Rhoades and Irani (2008) explain that media often plays a role in the visual stereotype of rural life or farmers, so it is important to track the stereotypes in order to eradicate the negative or wrong connotations of rural America in consumers’ minds.

The purpose of this study was to determine the use of visual framing through YouTube and the importance of good quality when using YouTube as a marketing and communications tool in R&P programs. The following objectives guided this research:

1. Determine the number of YouTube pages for each commodity group, total subscribers, number of posted videos, year established, and number of categories/playlists.
2. Analyze each of the commodity groups’ YouTube homepages by reviewing the overall quality of the page, the video thumbnails, and the categories found on each of the pages, and determine the visual frames for each of the categories on the homepage.
3. Analyze the top five most popular videos on each of the commodities’ YouTube pages and determine the number of views, likes, and quality of each.
4. Analyze the top five most popular videos on each of the commodities’ YouTube pages, determine the visual frames for any videos
5. Analyze the top five most popular videos on each of the commodities’ YouTube pages and determine if any agriculture semiotic messages were found in the visual nature of each of the videos.

**Conceptual Framework**

**Framing/Visual Framing**

Nisbet (2009) defined communication frames as “interpretive storylines that set a specific train of thought in motion” (p. 22). Framing theory refers to how a message is presented to an audience. Framing does not refer to what a message is, rather how the message is being presented (Scheufele & Iyengar, 2012). Rodriguez and Dimitrova (2011) said framed messages come from the creator of the message taking a surplus of information and condensing it all to effectively share the message with the public. In order for the public to organize the surplus of information, it must create “mental maps,” to make sense of it all. These mental maps are considered “audience frames” (Rodriguez and Dimitrova, 2011). The audience uses these mental maps to make sense of all similar information they are subject to (Rodriguez and Dimitrova, 2011).

The concept of visually framing messages arose as the importance for visually communicating to the audience arose (Rodriguez & Dimitrova, 2011). O’Neil and Smith (2014) explained images help in information exchange as they draw an individual’s interest easier than text. An audience interpreting visual information requires less of a cognitive load than text, and audiences appear more likely to accept visuals as the truth (Rodriguez & Dimitrova, 2011). Individuals can remember the visual information and images can be understood across the world (O’Neil & Smith, 2014). Framed messages should have the ability to explain or educate the public about a topic, thus guiding how an individual should think or feel (Nisbet, 2009), based on their previous understanding of the world (Rodriguez and Dimitrova, 2011).

**Semiotics**

As the way videos are framed is determined, it is also wise to analyze if any semiotics were used in regard in regard to rural or agricultural related way of life (Rhoades & Irani, 2008). Semiotics is a philosophical framework, which studies how visuals create messages through signs and codes (Rhoades & Irani, 2008). According to the W.K. Kellogg Foundation (2002), the media has shed a wrong perception of rural America or farmers today. There is concern that farmers and ranchers are being portrayed as lacking in a modern context (Rhoades & Irani, 2008). The urban national news media may be one reason for the incorrect understanding of farmers and ranchers (W.K. Kellogg Foundation, 2002), however it is necessary to look at the media portrayals of the agricultural industry, from messages coming from the agriculture industry (Rhoades & Irani, 2008). After researching semiotics in agriculture print media, Rhoades and Irani (2008) suggested doing a similar study, instead looking at an agriculture video advertisement source.

Both Rhoades and Irani (2008) and the W.K. Kellogg Foundation (2002) researched three similar, common misconceptions being portrayed in the media. The classifications of the different symbols analyzed were: demonstrating use of staged visuals conveying life as a farmer or rancher, or visuals showing common discussed issues the industry faces; people in rural areas being less smart and impoverished comparative to urban areas; and demonstrating the between a rural vs. urban lifestyle, as in rural being a peaceful way to life. The researchers determined if the messages fell into any of the categories (Rhoades & Irani, 2008; W.K. Kellogg Foundation, 2002).

**Homepage and Video Quality**

Although the way a message is presented, or framed, is important, the quality of the message should also be carefully crafted. Even the first impression of a YouTube page should be planned as it is easily remembered and the first recognizable story of a brand to an individual (Rodriguez & Dimitrova, 2011). The following practices have been reported as effective professionalism, branding, and marketing strategies on YouTube channels: A consistent presence of the brand logo, an apparent thematic plan for video topics, background colors that match the brand, the player view, and featuring the most popular content (Brooks, 2011; Guerrera, 2011). In addition to creating a memorable YouTube page, an organization must create quality, compelling videos. Brooks (2011) defined a compelling video as one that is helpful and valuable in addressing an audience’s needs. Quality videos are shot using a tripod, proper lighting, clear focus, obey the rule of thirds, have an appropriate setting for the storyline, and optimize video text (Brooks, 2011; Guerrera, 2011). Also, Brooks (2011) suggested naming a video with the common search terms used first.

**Methodology**

This study employed content analysis methodology of half of the USDA-overseen national agricultural commodity groups’ YouTube pages. The authors randomly selected 11 of the 22 USDA national R&P programs by using the alphabetically listed R&P programs from USDA’s website (USDA, n.d.). The researchers numbered the list and then used a random number generator to identify the checkoffs to analyze in the sample. The first number pulled on the random number generator was number four, which was the Christmas Tree Promotion Board, since it was the fourth on the alphabetical list on the USDA website (n.d.). The 11 national R&P programs that were selected for the study were as follows: Christmas Tree Promotion Board, Mushroom Council, National Mango Board, Cattleman’s Beef Board, Paper & Packaging Board, National Processed Raspberry Council, National Pork Board, United Soybean Board, Popcorn Board, Softwood Lumber Board, and Fluid Milk Processors Promotion Program.

The sample of the 11 national R&P programs’ YouTube home pages were all analyzed on May 21, 2017, to ensure pages were not updated during the data collection process. A researcher-created codebook was utilized to analyze each YouTube site. Researchers independently coded each site for titles of videos, number of subscribers, total number of videos, year established, the layout of the homepage, common themes of videos, and number of homepage video categories,

The categories or playlists on YouTube homepages were classified into frames based on the category title, video thumbnails and titles. These categories, or playlists, were classified into visual frames including recipes, nutrition, handling and use, product facts, video contests, sentimental, and innovative.

The researchers decided upon the seven frames after reviewing the common types of videos on all of the commodity pages. The researchers determined recipes as videos sharing ways to prepare the commodity they represent to eat. Nutrition was defined as a video solely giving the health benefits or sharing healthy habits in regard to their commodity. The researchers determined handling and use would refer to how to use safe practices in preparation and consumption of the commodity they represent, or how to safely or accurately use a commodity that is not edible. Product facts were considered videos sharing information about where the product comes from and/or how it got to your home. Video contests were defined as events for contestants to submit videos to YouTube for a prize. The researchers considered a video visually framed as sentimental if the goal of the work was to emotionally connect with the audience. Most of these videos did not seem like an advertisement until the commodity shared the logo at the end. Last, the innovative frame was defined as a video sharing new and different ways to use or see a product.

The researchers then independently analyzed the five most popular videos on each page for quality. The researchers created an instrument that measured the effective use of lighting, focus, tripod use, shot frames, setting, use of text, editing, title, and overall helpfulness of the content – areas of video quality discussed above (Brooks, 2011; Guerrera, 2011; Rodriguez & Dimitrova, 2011). Each element was scored on a five point Likert-type scale with 1 being poor quality and 5 being outstanding quality. The mean score for each element was figured, and then a grand mean for all five videos in the sample was figured and reported.

The researchers coded the type of visual frame used for each of the top five videos on the pages. The same seven video frames were used that were used to determine the category frames. Each video was put into the frame that best described it.

The researchers, then, looked at the five most popular videos to determine if any are visually conveying semiotic messages. The researchers will analyze the videos without sound and determine if the message is conveying a semiotic message by using the three common misconceptions used by Rhoades & Irani (2008) and the W.K. Kellogg Foundation (2002). The researchers coded n/a, if the video was not a message about rural life, or farming and ranching. If there were one or more of the common visual semiotic, the researchers would code that it was present. If there was an opportunity for a semiotic message, but there was not one, the researchers would code that it was not present. The researchers would code “defying” if it a video appeared to be consciously diverting the common misconceptions.

Two researchers independently coded the YouTube page and videos then, in cases of discrepancies, met to reach consensus. The primary researcher for this study was trained in video production by the secondary researcher, so there was consistency in the understanding of video quality, video frames and video semiotics. The researchers agreed on approximately 95% of the coded materials. In cases of discrepancies, the researchers discussed to reach consensus so that all findings were consistent.

**Findings**

Of the 11 commodity checkoff groups in the sample, nine had a findable presence on YouTube. Researchers conducted several searches with multiple search terms and did not find YouTube pages for Softwood Lumber Board or Fluid Milk Processors Promotion Program. Table 1 addresses the first research objective regarding general information about the YouTube presence of commodity groups in the sample. The National Mango Board has utilized YouTube the longest, beginning in the early days of the site in 2007. The range of number of videos posted was quite varied, with seven being lowest (Christmas Tree Promotion Board) and 151 the highest (United Soybean Board). The Paper and Packaging Board has the most amount of subscribers (*n* = 7,544) and the Popcorn Board has the least (*n* = 43).

To address the second research objective, the researchers analyzed each of the commodity groups’ YouTube homepages for overall quality of the page, the video thumbnails and the category frames found on each of the pages. The researchers determined the overall quality of the homepage by scoring the homepage’s consistency with the brand, the layout of categories and effectiveness of the thumbnail image. For the most part, each of the checkoff’s YouTube page exhibited consistency with its brand, demonstrated use of a plan for the videos posted, and displayed clear, bright, and descriptive thumbnail images. All but two organizations seemed to organize videos into categories (i.e. playlists) with a clear plan. The three most common category frames were recipes (*n* = 20), handling & use (*n* = 18) and video contests (*n* = 9). Almost all checkoffs had handling and use videos; the video contests category was driven by the National Mango Board, which hosted several events for contestants to submit videos to YouTube for a prize.

Table 1. General information regarding the YouTube pages in the sample.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Checkoff Name | Number of subscribers | Number of pages | Number of videos | Year established | Number of categories |
| Paper & Packaging Board | 7,544 | 1 | 37 | 2015 | 2 |
| National Pork Board | 5,831 | 2 | 110 | 2008 | 0 |
| Cattlemen’s Beef Board | 5,191 | 2 | 110 | 2013 | 15 |
| National Mango Board | 1,171 | 1 | 97 | 2007 | 14 |
| Mushroom Council | 529 | 1 | 40 | 2012 | 7 |
| United Soybean Board | 231 | 1 | 151 | 2009 | 2 |
| Christmas Tree Promotion Board | 59 | 1 | 7 | 2016 | 0 |
| Processed Raspberry Council | 47 | 1 | 14 | 2014 | 9 |
| Popcorn Board | 43 | 1 | 40 | 2012 | 4 |
| Softwood Lumber Board | -- | 0 | -- | -- | -- |
| Fluid Milk Processors Promotion | -- | 0 | -- | -- | -- |

The researchers went on each of the commodity’s YouTube pages and sorted the videos by most popular first, and then analyzed the quality of the top five most popular videos. Additionally, the researchers recorded the number of total views and total likes. The data are reported in Table 2. Paper & Packaging Board had the greatest quality score (*M* = 5.00, *SD* = 0.00) while National Mango Board received the lowest (*M* = 4.22, *SD* = .42). The range of total views greatly varied, with the highest being Cattleman’s Beef Board (*n* = 18,621,523) and the lowest being National Processed Raspberry Council (*n* = 5,100).

Table 2. Quality, views and likes for the top five most popular videos on each YouTube page

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Checkoff Name | Total views | Total likes | Range of views | Range of likes | Mean quality score | *SD* |
| Cattlemen’s Beef | 18,621,523 | 610 | 950,875-9,921,368 | 79-300 | 4.93 | 0.15 |
| National Pork Board | 4,272,055 | 4463 | 136,154-3,241,263 | 125-3,408 | 4.31 | 0.21 |
| National Mango | 3,547,232 | 15 | 6,870-3,434,431 | 0-11 | 4.22 | 0.42 |
| Paper & Packaging | 2,842,339 | 3435 | 284,664-761,789 | 120-2,151 | 5.00 | 0.00 |
| United Soybean | 203,737 | 42 | 2,445-131,399 | 0-24 | 4.98 | 0.05 |
| Mushroom Council | 98,199 | 244 | 3,292-73,263 | 4-105 | 4.42 | 0.12 |
| Christmas Tree | 18,760 | 256 | 84-13,835 | 0-225 | 4.33 | 0.42 |
| Popcorn Board | 12,586 | 17 | 397-10,629 | 0-9 | 4.67 | 0.42 |
| Processed Raspberry | 5,100 | 33 | 142-3,373 | 1-11 | 4.47 | 0.47 |

*Note*. The two groups without YouTube pages were not included in this table.

Just as in object three, the researchers sorted the videos on each of the commodity’s pages by most popular for objective four. They then analyzed the each of the video and assigned visual frames to each. Each of the 45 videos were considered one of seven visual frames including: Sentimental (*n* = 17), recipe (*n* = 9), handling and use (*n* = 8), food facts (*n* = 7), humor (*n* = 2), innovation (*n* = 1) and nutrition (*n* = 1). The range of frames varied largely, with sentimental accounting for 17 and innovation and nutrition only accounting for one a piece.

Again, the researchers sorted the videos on each of the commodity’s pages by most popular, and began to analyze the for semiotic messages related to agriculture misconceptions. The researchers watched the videos without sound so concentration was spent of the visual nature of the video. Out of the 45 most popular videos, 16 were applicable to collect data. This means the videos included a farmer, were in a rural area and/or looking at a rural lifestyle. From the 16 analyzed, 11 had one of the three forms of common misconceptions visually symbolized in the video. The semiotic message was absent in four, and only one video defied the common misconceptions.

**Conclusions**

Many of the checkoffs in the sample have taken advantage of the visual elements YouTube offers, and are using that to help consumers with the product. A homepage is often the first impression of a business, so it is important to appear professional, trustworthy and consistent with your brand. All of the YouTube pages were consistent to the brand, which the researchers believe to be an important attribute. Some of the commodities did lack on showing a clear plan on the category content and themes. This did not appear to affect the number of subscribers, however the researchers noticed the entire homepage does appear less organized when a theme is not apparent.

The overall participation on YouTube of the checkoff groups in the sample was widely varied, both in numbers of subscribers, likes, views, and total videos, as well as with the topics of the categories (or playlists). From the collected research, the researchers wanted to see the most common video frames the commodity groups were posting. The research showed the most common categories on the commodities’ homepages were recipe videos, followed by handling and use.

After collecting data in regard to the commodity’s most commonly posted videos, the researchers thought it important to determine the video frames that were considered the most popular among the audience. The researchers found 91% of the videos were framed as sentimental, recipe, handling and use, or food facts. Of the 45 videos analyzed, sentimental framed videos accounted for 37 percent. It is assumed that sentimental videos are so popular because they are the most common to be shared among friends. Rodriguez & Dimitrova explain that visual information requires less of a cognitive load than text, so it makes sense that the second and third most popular video frame is recipes and handling and use. It is possible that the increase of consumer fear in food has created more popularity among videos discussing facts about food. It would be interesting to see further research in which frames of messages about agriculture are most popular among consumers.

Sentimental framed videos were the most common among the most popular videos on all of the channels. The top five most popular videos on both the Paper & Packaging Board and the Christmas Tree Promotion Board were all visually framed as sentimental. It is interesting to note that sentimental is the most popular among views, however the sentimental frame only accounts for four of the 53 categories on each of the homepages. The researchers suggest determining the most popular types of videos and creating more similar to your findings. This will not be the sentimental frame for all of the commodities. For example, the National Pork Board’s top five most popular videos were all food facts, so it might be wise to spend more time creating videos related to facts about pork.

Handling and Usage ranked second as the most common category on the commodities homepage, and third in the most popular frame among viewers. This did not surprise researchers, as one purpose of checkoffs is to increase demand for a product (USDA, n.d.). If consumers do not know how to properly handle a product, demand could decrease. Poor handling and use could be detrimental to consumers, so it is very important to have that information available for consumers who are looking to safely cook a commodity. For the health of consumers, individuals must know proper and safe techniques in handling. For this reason, it is important that commodities continue to create videos regarding handling and use.

It appears that the organizations are reaching their own audiences where they would like to be reached. For example, of the top five most watched videos on the National Mango Board’s site, four were about cutting a mango. Since they joined Facebook in 2007, the National Mango Board will release a new video using new technology about cutting a mango every few years. This is an example of a commodity knowing what the audience is wanting and needing in regard to their commodity.

The Paper and Packaging Board presented an interesting case in that it does not have an edible product and obviously does not have recipe videos; however, the group received a perfect score for the quality of videos. The group used sentimental and innovative frames with some of its videos, rather than the how-to that many other commodities use.

Many of the videos on the commodities pages were high quality as supported by Brooks (2011) and Guerrera (2011). The Beef Checkoff, which had the second-highest number of videos on its YouTube site (110), utilized YouTube very well in using recipes, and handling and use frames and having good quality video. The National Mango Board received the lowest quality score, because a few of the most popular videos were from 2007. This could be avoided by making current videos about the same topic, so they could delete the older videos. On the other hand, the older videos have so many views that it is more likely to show up at the top of searches, which might be why the National Mango Board has continued to keep the older videos.

Common misconceptions about rural and farm life have risen in urban societies, so it was important to see if agriculturalists are adding to the stigma. There were not many videos on the top five most popular related to farmers, rancher or rural life. This surprised the researchers as it was assumed that the audience would be more interested on where food comes and the production side of agriculture as society is beginning to loose trust in this way. Of the videos that did relate to farmers, ranchers or rural life, 11 showed a presence of the common semiotic views of urban society. However, one video created by the beef checkoff did try to defy the common misconceptions.

The different visual frames of categories or playlists also did not have an influence on the number of subscribers. The data does not suggest a strong influence of video quality based on the views or likes of the video. However, the data appear to reflect a stronger influence on likes than views. For example, the highest grand mean quality score for a video was the Paper & Packaging Board (*M* = 5.00, *SD* = 0.00) and also the second highest total likes (*n* = 3,435). On the other hand, the National Mango Board was rated the lowest for quality (*M* = 4.22) and had the lowest total amount of likes (*n* = 15). It is important to note, however, the Mango Board was the first checkoff in the sample to have a YouTube site, and some of their videos are of lesser quality simply because they were made 10 years ago with older equipment.

There were limitations on how deep researchers could go into coding for this study. However, even with limited data, a trend is evident whereby good quality usually brings more viewers. To demonstrate, the Beef Checkoff had a 4.93 mean quality score (*SD =* 0.15), and more than 18 million views of the five videos observed; Paper and Packaging had a 5.00 mean quality score (*SD* = 0.00) with nearly three million views of its top five videos. As a goal of checkoffs is to improve demand (Findley, 2007), more viewers will hopefully result in consumer’s comfort with using that specific commodity, and then more willing to buy.

Future recommendations for research would be to examine more of the videos on a YouTube page, as well as analyze all checkoffs presence. It would be interesting to understand specifically what an audience member would look at to determine if they believe the commodity to be a credible source. Agrawal (2016) claimed YouTube to be a good communication outlet as it helps engage and helps build credibility and trust among the audience. This research looked more at the engagement through video quality and frames, which is very important to an organization. However, it would be interesting to determine the level of credibility and trust the audience has for a commodity based on their YouTube presence.

Although research has shown it to be a negative effect on the industry, it would be interesting to see if the misconceptions of farmers and ranchers are actually positive to the public. It appeared that a few of the videos in this study tried to convey that the industry is not as dirty or as much hard work as it is. If these are the most popular videos, it could be possible that the community is buying into this. It was positive to see that there was not a negative light casted on the people in rural areas being less smart and impoverished comparatively to urban areas. However, if these were messages created by urban media sources, this type of symbolism might appear more evident.

It would be interesting to do further research to determine the influence of subscribers. Since the researchers did not see an influence with the number of subscribers on homepage quality, video quality, or visual frames, it would be interesting to study what motivates an individual to subscribe to a channel.

Other recommendations for future research would be to further understand the nature of videos popularity. The researchers did not look at comments or dislikes on each of the videos. It was apparent in the research that sometimes a video is ranked popular because it is viewed in a negative light. It is possible that individuals are watching and sharing videos based on their dislike or distrust in the video. The researchers did not determine if the reason for popularity was positive and negative, but this would be important to determine before creating more videos of a similar nature.

**References**

Agrawal, A. (2016). *3 Reasons Why You Should Be Marketing on YouTube And Periscope.* Retrieved from https://www.forbes.com/sites/ajagrawal/2016/01/03/3-reasons-why-you- should-be-marketing-on-youtube-and-periscope/#3173f3673173

Belk, R. W., & Kozinets, R. V. (2005). Videography in marketing and consumer research. *Qualitative Market Research: an international journal*, *8*(2), 128-141.

Brooks, R. (2011). *8 Ways to Maximize Your YouTube Marketing Results: Social Media Examiner.* Retrieved from http://www.socialmediaexaminer.com/8-ways-to-maximize- your-youtube-marketing-results/

Brown, J. S. (2005). *Storytelling in organizations: Why storytelling is transforming 21st century organizations and management*. Burlington, MA: Elsevier.

Findley, M., Doerfert, D., Heuman, A. N., Davis., Akers, C., & Davis C. (2011). *Membership Organization Communication: An Interpretive Analysis of Agricultural Producers' Perspectives on Relationships with Checkoff Organizations*.

Guerrera, D. (2011). *12 Tips to Instantly Enhance Video Production Quality.* Retrieved from https://blog.hubspot.com/blog/tabid/6307/bid/29075/12-Tips-to-Instantly-Enhance-Video-Production-Quality.aspx#sm.0001dmu2c5bpaequuf913px4haxnz

Johnson, P. (2017). Importance Of YouTube Marketing & Advertising. Retrieved from https://www.wpromote.com/blog/importance-youtube-marketing-advertising/

Kellogg Foundation (2002, November 1). Perceptions of rural America: Media coverage. Retrieved July 21, 2017, from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwi3grzvmNDVAhXoslQKHXZVCHAQFgguMAE&url=http%3A%2F%2Fwww.wkkf.org%2F~%2Fmedia%2F0AE660039A644B778DF6745130DEE46E.ashx&usg=AFQjCNHd97P8FDgVXJ0wEZD87r07BgoGUA

Manzo, K. (2010). Beyond polar bears? Re‐envisioning climate change. *Meteorological Applications*, *17*(2), 196-208.

Moore, M., Meyers, C., Irlbeck, E.G. & Burris, S. (2012). *Exploring U.S. Agricultural Commodity Organizations’ Use of Blogs as a Communications Tool*.

Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment: Science and Policy for Sustainable Development*, *51*(2), 12- 23.

O'Neill, S. J., & Smith, N. (2014). Climate change and visual imagery. *Wiley Interdisciplinary Reviews: Climate Change*, *5*(1), 73-87. Doi: 10.1002/wcc.249

Rhoades, E. B., & Irani, T. (2008). " The stuff you need out here": a semiotic case study analysis

of an agricultural company's advertisements. *Journal of Applied Communications*, *92*(3), 4.

Rodriguez, L., & Dimitrova, Daniela V. (2011). The levels of visual framing. *Journal of Visual Literacy,* *30*(1), 48-65.

Rotman, D., & Preece, J. (2010). The 'WeTube' in YouTube–Creating an online community through video sharing. *International Journal of Web Based Communities*, *6*(3), 317-333.

Scheufele, D. A., & Iyengar, S. (2012). The state of framing research: A call for new directions. *The Oxford Handbook of Political Communication Theories. New York: Oxford University Press*.

USDA. (n.d.). Research & promotion. *United States Department of Agriculture. Agricultural Marketing Services.* Retrieved from https://www.ams.usda.gov/rules- regulations/research-promotion

Waters, R. D., & Jones, P. M. (2011). Using video to build an organization’s identity and brand: A content analysis of nonprofit organizations’ YouTube videos. *Journal of Nonprofit & Public Sector Marketing*, *23*(3), 248-268. doi: 10.1080/10495142.2011.594779

Winsor, L. (2016). *Why Farmers Need to Advocate for Agriculture.* Retrieved from http://www.farmfutures.com/blogs-why-farmers-need-advocate-agriculture-8628

**Coaching Communications: A Case Study of a   
Discipline-Specific Peer-Led Writing Center**

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**Abstract**

*This study describes efforts to improve students’ writing skills via peer tutoring in a discipline-specific writing center. Although data collection was limited to the last third of the semester, results indicate peer tutors spent the majority of tutoring sessions addressing structural concerns, rather than style, grammar or punctuation. Additionally, tutors indicated that students’ writing improved during the course of the semester. Tutors, even in a discipline-specific setting, likely need a flexible skillset and must be prepared to review multiple writing genres.*

**Introduction**

As discipline-specific writing movements garner traction, writing instructors are left to grapple with the best methods to provide feedback to students in courses with highly-specific writing guidelines. Known as Writing Across Curriculum and Writing in the Disciplines, these types of writing approaches vary in their focus. While some researchers use the terms interchangeably, Monroe (2003) outlined the following differences: Writing Across Curriculum programs emphasize transferrable writing skills, including “commonality, portability, and communicability of writing practices,” while Writing in the Disciplines focus on “disciplinary differences, diversity, and heterogeneity” (para. 1). In his case for improving writing by incorporating discipline-specific approaches as early as possible, Monroe explained a “one-size-fits-all approach” (“Staffing,” para. 4) to writing does not match the requirements for effective communication among various disciplines.

In their review of an upper-level writing course housed in a chemistry department, Stoller, Jones, Costanza-Robinson and Robinson (2005) explained that the increasing number of discipline-specific writing courses have stemmed from the Writing Across and Curriculum and Writing in the Disciplines movements to address students’ writing abilities. Writing in the Disciplines, especially, they wrote, “helps move students toward becoming members of the discourse communities associated with their academic disciplines (para. 1, 2005). In his study of faculty perceptions about academic writing and writing instruction, Zhu (2004) found the bulk of the writing for upper-level and graduate students is discipline-specific. However, faculty, Zhu wrote, often view themselves as providers of both writing opportunities and content-related, or summative rather than formative, feedback.

To be sure, traditional campus writing centers have long recognized the benefits of developing students’ writing skills through discipline-specific writing instruction. Wallace (1988) noted incorporating discipline-specific tutoring services became an important component of a university writing center. Since the early 1980s, the teaching of writing has transformed from end-product evaluation to incorporation of the collaborative process of writing (Leahy, 1990). In that transformation, however, writing centers were left to battle an image problem of being a “remedial or fix-it shop” (Leahy, 1990, p. 45). North (1984), in his landmark writing center “declaration of independence” (p. 441), implored instructors to recognize the writing center is for writers, not teachers.

“In a writing center the object is to make sure that writers, and not necessarily their texts, are what get changed by instruction. In axiom form it goes like this: Our job is to produce better writers, not better writing” (North, 1984, p. 438).

This study incorporates Monroe’s (2003) description of Writing in the Disciplines and describes undergraduate peer tutoring via a discipline-specific writing center operated by an agricultural communications program and not tied to a university writing center.

The Oklahoma State University agricultural communications faculty designed and implemented during the Spring 2017 semester an undergraduate-staffed writing center specifically for students in agricultural communications courses. The writing center tutors were selected based on their performance in previous agricultural communications courses and were compensated for their work through departmental funds. The tutors met with agricultural communications faculty members for an orientation and training session prior to the start of the semester. Faculty members updated the tutors throughout the semester on common writing problems and how to address them. Agricultural Communications Writing Center was physically housed in office space on loan from another department. The center was assigned an official email address with a university domain, which was used to make tutoring appointments.

**Purpose and Objectives**

The purpose of this research was to describe preliminary efforts to enhance undergraduate peer tutoring via a discipline-specific peer-led writing center.

The following research questions guided this study:

1. What is the quality of student writing when assignments are brought to peer tutors for assistance?

2. Does a discipline-specific peer-led writing center improve student writing?

**Methods**

The researchers sought Institutional Review Board approval to collect data on each tutoring session conducted in the writing center. The writing center tutors were asked to complete a Qualtrics instrument designed by the researchers to assess the tutoring sessions. The instrument recorded assignment structure and required writing style. It also included evaluative questions regarding the percentage of time spent during the session on style, structure, grammar, punctuation, and sourcing. Additionally, the writing center tutors were asked to evaluate the student client’s mastery of those concepts.

Institutional Review Board approval was granted at mid-semester, allowing for data collection only in the last third of the semester. However, this timeframe incorporated the deadlines for the program’s end-of-semester writing assignments. Any student enrolled in an agricultural communications course could seek tutoring at the writing center, including those in a writing-based service course that fulfills college’s upper-level writing requirement. In all but one course, students received extra credit for seeking tutoring at any university writing tutoring service, including this discipline-specific writing center. Students who sought tutoring at the agricultural communications writing center received an information sheet regarding this research project at the beginning of each tutoring session. After the session, the tutors completed the Qualtrics assessment. An email listing the client student’s name, class, and a short synopsis of the meeting was sent to instructors. However, all other evaluative data was stored in a separate database until after submission of final grades.

**Findings**

During the Spring 2017 semester, the Agricultural Communications Writing Center staff facilitated 124 tutoring sessions. Of those sessions, 43 occurred during the specific data-collection period. Twenty-seven those sessions (62.8%) were linked to two core curriculum journalistic writing classes required for all agricultural communications majors. The remaining sessions were linked to the program’s writing-based service course for non-agricultural communications majors, all of which offered extra credit for visiting a writing center.

Associated Press style was required for 32 (74.4%) of writing assignments assessed by the writing center tutors (see Table 1). Modern Language Association style was required for six (14%). American Psychological Association style was required for four (9.3%).

|  |  |  |
| --- | --- | --- |
| Table 1 | | |
| *Writing Style Required for Assignment* | | |
| Writing style | Frequency | % |
| Associated Press | 32 | 74.4 |
| American Psychological Association | 4 | 9.3 |
| Modern Language Association | 6 | 14.0 |
| Other | 1 | 2.3 |
| Total | 43 | 100 |

The writing center tutors reported, on average, just less than half of each tutoring session focused on the structure, or flow, of assignments. Tutors spent an average 23.95% of each session addressing grammar, while 22.2% of session time focused on punctuation. Attention to writing style accounted by 4.18% of each session.

At the end of each session, writing center tutors evaluated the student client’s mastery of the following skills: writing style, structure, grammar, punctuation, and appropriateness of sources. The tutors had the parameters of deficient/unacceptable, needs work (numerous errors), adequate (multiple errors), good (a few errors), excellent (nearly perfect), or not applicable for this assignment. Overall, the majority of structure, grammar and punctuation mastery evaluations were considered “good” (See Table 2). However, 30 of the 43 evaluations (69.8%) rated the student clients as having “excellent” mastery of appropriateness of sources.

Of the 43 assignments evaluated by writing center tutors for this research project, 36 (83.7%) were written with a “good” or “excellent” mastery of writing as defined by having “a few errors” or as being “nearly perfect.”

Table 2

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Mastery of Writing Skills as Evaluated by Writing Center Tutors* | | | | | | | | | | | | |
|  | Deficient / Unacceptable | | Needs Work | | Adequate | | Good | | Excellent | | Not applicable | |
|  | % | *f* | % | *f* | % | *f* | % | *f* | % | *f* | % | *f* |
| Style (AP, APA, MLA, etc.) | 0.00% | 0 | 6.98% | 3 | 6.98% | 3 | 27.91% | 12 | 55.81% | 24 | 2.33% | 1 |
| Structure / Flow | 0.00% | 0 | 4.65% | 2 | 20.93% | 9 | 55.81% | 24 | 16.28% | 7 | 2.33% | 1 |
| Grammar | 0.00% | 0 | 0.00% | 0 | 13.95% | 6 | 55.81% | 24 | 27.91% | 12 | 2.33% | 1 |
| Punctuation | 0.00% | 0 | 0.00% | 0 | 13.95% | 6 | 62.79% | 27 | 20.93% | 9 | 2.33% | 1 |
| Appropriateness of Sources | 0.00% | 0 | 0.00% | 0 | 2.33% | 1 | 11.63% | 5 | 69.77% | 30 | 16.28% | 7 |

The Qualtrics instrument allowed the tutor to record written open-response notes regarding the session. Of the 35 evaluations that included a response, seven referenced the student client’s writing improving throughout the semester. For example, the following notes were shared by a tutor: “This student has come to see me for every assignment and has greatly improved her writing throughout the duration of the semester.”

Tutors documented both successes and frustrations. For example, the tutors recorded following notes: “Session went well, could see the student start to catch on after a few minutes of explaining structure” and “Student was not very open to ideas or suggestions. She did not understand page requirements or the assignment length.” Some notes demonstrate how the writing center tutors were able to troubleshoot common writing mistakes: “Attribution was the biggest issue. A majority of her paraphrases were in the first person.” Other notes demonstrate students of all ability levels seemingly took advantage of the Agricultural Communications Writing Center: “Student was very worried about her writing, although it was pretty good” and “Session went quickly, student had few concerns and was confident with her writing.”

**Conclusions**

**Conclusions related to Research Question 1**

The findings of this research clearly indicate writing center tutors, even in a discipline-specific center, need a solid grasp of various writing style rules, including professional and academic. Additionally, while knowledge of style is vital, so is the ability to differentiate among appropriate writing structures. For example, while inverted pyramid is expected in journalistic communications classes, discipline-specific writing center tutors also must be able to provide instruction in research and essay writing.

The majority of assignments evaluated by the writing center tutors were in good shape according to writing style and appropriateness of sources. However, the data collection for this research occurred at the end of the semester. It may be the skill set of the writing center tutors must be flexible throughout the semester as student clients’ needs change from instruction on style and sourcing to a more intense focus on structure.

**Conclusions related to Research Question 2**

Without a full semester of data, it is difficult to determine whether the discipline-specific writing center improved student writing. However, anecdotal evidence provided through the writing center tutors’ notes indicates improvement in the quality of work for many students who frequently visited the center. For example, 20% of the notes referenced student clients’ writing improvement throughout the semester. Additionally, the notes indicate discipline-specific writing techniques are being addressed during the sessions, including sourcing, style, and structure.

**Discussion**

The discipline-specific writing center shows promise in helping develop the writing skills of students in agricultural communications courses. In particular, agricultural communications students must develop solid journalistic writing skills. However, advisers of discipline-specific writing centers would do well to determine whether the goal of the center is to create better writers or provide a copyediting service and recognize the difference. In an effort to advance this practice, the promotion of the discipline-specific writing center among faculty and tutors should align with North’s (1984) assertion that writing centers are intended to make better writers and not a way to churn out better copy. Future assessment on the writing center should keep North’s essay in mind. Additionally, the discipline-specific writing center tutors should receive formal, ongoing training even if these students are selected for their roles because of their outstanding abilities within the discipline. Beck, Hawkins, Silver, Bruffee, Fishman, and Matsunobu (1978) noted “the success of a peer-tutoring program depends a good deal on how the tutors are trained” (p. 433).

Further research should consider whether students are more likely to visit a discipline-specific writing center and the student perspectives on its value.

**References**

Beck, P., Hawkins, T., Silver, M., Bruffee, K. A., Fishman, J., & Matsunobu, J. T. (1978). Training and using peer tutors. *College English*, *40*(4), 432-449.

Leahy, R. (1990). What the College Writing Center Is—and Isn't. *College Teaching*, *38*(2), 43-48.

Monroe, J. (2003). Writing and the Disciplines. *Peer Review*, *6*(1), 4.

North, S. M. (1984). The idea of a writing center. *College English*, *46*(5), 433-446.

Stoller, F. L., Jones, J. K., Costanza-Robinson, M. S., & Robinson, M. S. (2005). Demystifying disciplinary writing: A case study in the writing of chemistry. *Across the Disciplines*, *2*.

Wallace, R. (1988). The Writing Center's Role in the Writing Across the Curriculum Program: Theory and Practice. *The Writing Center Journal,8*(2), 43-48. Retrieved from http://www.jstor.org/stable/43441865

Zhu, W. (2004). Faculty views on the importance of writing, the nature of academic writing, and teaching and responding to writing in the disciplines. *Journal of second language Writing*, *13*(1), 29-48.

**Why Did They Leave? An Examination of Agricultural Educator Attrition**

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**Abstract**

*A national shortage of agriculture teachers has led to increased pressure for agricultural education as a profession to recruit and retain quality teachers. This phenomenological study was conducted with teachers (n = 12) in Idaho who completed at least one year teaching and left the teaching profession before completing ten years of service. Semi-structured interviews were conducted to obtain data related to the shared experience of participants who had all made the choice to leave agricultural education as a profession. Results indicated the emergence of four core themes related to the decision to leave; altruism, teacher self-efficacy, factors outside of teaching, and lack of programmatic and personal support. The results of this study allow us to make recommendations to help mitigate some of the difficulties facing teachers who have the potential to leave. Among recommendations are a strengthening of preservice instruction to enhance teacher self-efficacy and communicating with stakeholders and an increased focus on altruistic factors which may help teachers remain in the profession.*

**Introduction/Theoretical Framework**

There are not enough agricultural educators to fill demand (Smith, Lawver, & Foster, 2016). According to the American Association for Agricultural Education (AAAE), a lack of qualified individuals resulted in the closure of numerous programs throughout the country in 2015 (Foster, Lawver, & Smith, 2016). Addressing the teacher shortage is a high priority for the agricultural education profession and requires examining both recruitment of new teachers and retention of current agricultural educators (Roberts, Harder, & Brashears, 2016).

Why do teachers leave the profession? Researchers have examined teacher attrition for decades and have cited working conditions, workload, administrator relations, and poor compensation as factors influencing the decision to leave education (Farber, 2015). This study was designed to collect data from those who are most able to speak to the decisions to leave the profession, teachers who have left. Understanding factors related to leaving the profession is an important first step in making system-wide modifications that will improve teacher retention (Farber, 2015). A teacher shortage in agricultural education has existed for almost 50 years (Drawbaugh, 1968). New agricultural educators face a well-documented struggle upon entering the profession (Boone & Boone, 2009; Myers, Dyer, & Washburn, 2005). It is no wonder that early career agricultural educators have increased stress, struggle with work-life balance, and often feel overwhelmed by their job responsibilities (Myers, Dyer, & Washburn, 2005).

Lemons, Brashears, Burris, Meyers, and Price (2015) qualitatively examined Texas teachers who had left the profession. They found teachers were passionate about their career but left due to workload and social burdens, the promise of better opportunities, and a disconnect between expectations of the profession. Researchers in agricultural education have also noted a high sense of teacher self-efficacy may be a major factor in keeping teachers in the classroom (Hasselquist, Herndon & Kitchel, 2017; Langley, Martin, & Kitchel, 2014; McKim & Velez, 2015; Wolf, 2011).

The framework for this study was based on Chapman’s (1984) model of teacher retention. Chapman noted the important factors related to teacher job satisfaction and attrition were preparation, quality of initial experience, commitment, personal factors, and integration.

**Purpose and Research Question**

The purpose of this phenomenological study was to examine Idaho agricultural educator experiences leading to their departure from the profession. The research question for this study was: What factors led agriculture teachers to leave the profession?

**Methods**

This study was conducted using the qualitative guidelines of a phenomenology set forth by Creswell (2007). Creswell stated that phenomenological research is in order when “it is important to understand several individuals’ common or shared experiences…to develop a deeper understanding about the features of the phenomenon” (Creswell, 2007, p. 60). Examining the shared experiences of those who chose not to continue teaching agriculture to gain more knowledge related to teacher retention was the main focus of this study.

To establish trustworthiness, we addressed the factors of credibility, transferability, dependability, and confirmability. Credibility was established through the use of peer debriefing and member checking, following the guidelines of Lincoln and Guba (1985), and triangulation of data (Creswell, 2007; Yin, 2010). To meet the condition of transferability, we employed field notes and collected ancillary information as descriptive data related to study participants (Denzin & Lincoln, 2008). Dependability and confirmability were established by maintaining an audit trail for reference of all coded data to raw sources (Lincoln & Guba, 1985; Yin, 2010)

The participants for this study were selected through a careful analysis of the Idaho agricultural education directory from 2004-2016. Names appearing on the list as a teacher were compared for each year, and those who were not on a subsequent list were flagged for further examination. Idaho has 129 full-time agricultural education positions. In the research window, there were 72 changes which resulted in a teacher leaving agricultural education in Idaho. Of those changes, 24 were retirements, 5 moved to another state but continued teaching agriculture, and 43 left the profession entirely. From the list of those who left the profession entirely, a contact list for participants was generated. Experts recommend conducting interviews with five to 25 individuals when exploring factors surrounding a phenomenon (Polkinghorne, 1989).

Participants were contacted through email or phone call to secure agreement for completing the interview process. From those willing to participate, a purposive group (*n =* 12) were selected to complete the interview process. Selection was based on having a wide range of preparation types, backgrounds, length of time in the classroom, and region of the state. The subjects in this study had a variety of teaching experience and background as shown in Table 1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1.  *Subject Characteristics and Teaching Background* | | | | | |
| Participant Number | Gender | Type of Preparation | Year Began Teaching | # Years Taught | Pseudonym |
| 1 | Male | Alternative | 2011 | 1 | J.D. |
| 2 | Male | Alternative | 2013 | 1 | Matt |
| 3 | Female | Traditional | 2003 | 5 | Kaley |
| 4 | Female | Traditional | 2004 | 8 | Allie |
| 5 | Female | Alternative | 2015 | 1 | Sally |
| 6 | Male | Traditional | 2015 | 1 | Chaz |
| 7 | Female | Alternative | 2011 | 3 | Deborah |
| 8 | Female | Traditional | 2006 | 1 | Summer |
| 9 | Male | Traditional | 2008 | 4 | Heath |
| 10 | Male | Alternative | 2014 | 2 | James |
| 11 | Male | Traditional | 2010 | 3 | Hector |
| 12 | Male | Traditional | 2006 | 6 | George |

Data collection occurred via telephone interviews ranging in length from 18:34 to 29:45 minutes. The interviews were semi-structured and followed an interview protocol designed to gather the essential information related to the phenomenon under investigation. Reflexive journaling collected and identified potential researcher bias (Lincoln & Guba, 1985; Denzin & Guba, 2008). The use of analytical and reflexive field notes in coding initial information served as measures related to establishing the trustworthiness of this study. Recorded interviews were transcribed verbatim. Each transcript was analyzed and each unique statement was separated into a singular data point. From the twelve interviews, *n* = 834 data points were generated and assigned a unique number for audit purposes. These data points were coded using open coding procedures. Axial coding procedures were used to condense the major categories into four core themes emerging from the research.

**Findings**

Analysis of data from the interview process resulted in the identification of four themes related to participants’ decision to leave the teaching profession: Teacher Self-Efficacy, Support, Outside Factors, and Altruism

**Theme 1: Teacher Self-Efficacy**

Many participants noted teacher self-efficacy issues in their path to becoming a teacher, and highlighted self-doubts that plagued them during their time in the classroom. These efficacy issues were prominent as teachers discussed their decision to leave the profession. Within the category of efficacy, three subthemes emerged: initial doubts, concerns about preparation, and concerns about managing the responsibilities of an agricultural educator.

Some efficacy concerns were evident in the participants’ preservice experience. Deborah noted “I actually didn’t seek to become an ag. teacher, I didn’t think I’d be good”. George said he got his teaching degree because “I didn’t think I would teach, but I wouldn’t regret it as a second choice.” Allie talked about her teaching degree by saying “it was something to fall back on, I needed a plan B and I didn’t think I would be a good teacher to be perfectly honest”. Teacher Self-efficacy concerns continued when teachers entered the classroom, and many noted feeling underprepared. Hector said “as far as the day-to-day classroom teaching, I don’t feel like I was very prepared, but I made do” and Summer said “I didn’t feel like I was totally confident within myself when I went into the classroom.” It is important to note that the concerns about preparation came from both traditional and alternatively certified teachers. Heath summed up his efficacy when he entered the classroom by saying “I learned during student teaching, but I just didn’t feel like I was ready enough to do a good job.”

The pressures of the job had an impact on teacher self-efficacy as well. Respondents noted concerns about paperwork, classroom management, lesson planning, and building community support. Heath said contributing to leaving was “the burnout and all the hours putting in”, Chaz said “when you first start to be an ag teacher it’s an overwhelming transition” while George said the job “just burns you up”. Kaley summarized the sentiments of the other participants and shared “probably at least once a week I drove home and said, I am not going to do this next year, this is so hard. I was just completely overwhelmed. I knew I couldn’t do it.”

**Theme 2: Support**

A lack of personal and programmatic support emerged as a theme contributing to teacher decisions to leave. Respondents shared their desire for community and administrator support for their program, and for a network of people to support them personally. Administrators played a large role in the decision for some of the participants to leave. Chaz said “probably the biggest challenge was working with the administration.” Summer shared that his administrators were “just not willing to understand what an ag program was about”. Community support for the program was also desired from teachers. James shared “the community support wasn’t there like I thought it should’ve or could’ve been” and Chaz echoed “there was not a strong connection between the community and the program.” Some teachers noted the feeling of being “stifled” by the lack of program support. According to Matt “its hard to build a program when no one wants to help”.

Participants also noted the importance of having a personal support system. Summer shared “ I was kind of stuck alone out in the middle of nowhere.” Sally said that she would “reach out [for support] and it was just like, just nothing.” Others shared feelings of not fitting in to the agricultural education community, and being thrown in to difficult programs. Many shared the need for qualified mentors. Allie said “thank god, another teacher reached out to me to help, I know others are not so lucky.” George said “what I think can help the new teachers most is to find a strong mentor teacher.”

**Theme 3: Outside Factors**

Not all of the factors teachers mentioned were within the scope of education. Although these factors comprised a relatively small number of data points, they are worth discussing as a reason participants chose to leave the profession. Kaley chose to leave to stay home with her children, noting “I will probably come back once my kids are older.” Others noted the impact of strained finances on their decision to leave. George said “I have a lot of friends that have quit school teaching because they find a job.” Sally was alternatively certified and reached the end of the provisional time before realizing “it was at the point where I either needed to invest money to get the certification or figure something else out, and I just didn’t have it.”

**Theme 4: Altruism**

Despite the struggles teachers faced in the classroom, participants in this study indicated a strong sense of altruism through their desire to contribute to agriculture through education. Data related to this area highlight that many of the participants loved the job, and were inspired to help students succeed. Almost all of the participants interviewed shared things about the job that they enjoyed. Allie shared “being an ag teacher is by far one of the best jobs in the world,” and Hector said “I’m grateful for the time I had as a teacher.” Four of the participants noted their desire to become and agricultural educator stemmed from their own high school experiences. Heath said “I got to see my former ag teacher’s passion for agricultural education.” When asked why he had a hard time leaving the profession, Kaley said “the FFA kept me going, kept me motivated I guess.” Although they had left the agricultural education classroom, almost all of the teachers interviewed were still working with youth or agriculture in some fashion. Sally runs an equine youth leadership camp, George still coaches wrestling at the school he left, and J.D. substitutes and notes that he is still in the agriculture classroom often.

**Conclusions/ Discussion/ Implications**

Participants in this study chose to leave the profession for individual reasons, but the examination of this phenomenon yielded similarities in experience and pointed to several factors which contributing to the choice to leave the profession. The results of this examination substantiated much of the previous literature related to leaving based on teacher self-efficacy, lack of support, and personal issues.

We can make several recommendations for teacher educators based on the findings. The hesitancy to enter the classroom and self-doubt upon entering the profession had a large impact on the participants in this study. Preparation of new teachers, whether in a 4-year degree program or an alternative certification program, should enhance the individual’s sense of teacher self-efficacy. Proper training for preservice and induction level teachers on how to communicate effectively with administrators at the local and district level and how to garner support from community members could help new teachers find the support they need for their programs. With a heightened ability to communicate, perhaps new teachers will have the skills needed to overcome a lack of programmatic support. Personal support can and should be provided through connections with quality mentors and instruction on how to build a personal support system as new teachers navigate their first few years. While we cannot mitigate personal factors, including personal choices in recruitment and induction programs could help increase awareness of their impact on an agricultural education career.

It is both promising and heartbreaking that so many participants, even those that didn’t initially see themselves in a teaching role, truly loved the profession they left. By taking lessons from the findings from this study, we could be well on our way to helping those who struggle and understanding how to increase the number of altruistic new teachers who choose to stay.

**References**

Boone Jr, H. N., & Boone, D. A. (2009). An assessment of problems faced by high school agricultural education teachers. *Journal of Agricultural Education*, *50*(1), 21-32. doi: 10.5032/jae.2009.01021

Chapman, D. W. (1984). Teacher retention: The test of a model. *American Educational Research Journal*, *21*(3), 645-658. doi: 10.3102/00028312021003645

Creswell, J. W. (2007). *Qualitative enquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2008). *Collecting and interpreting qualitative materials* (Vol. 3). Thousand Oaks, CA: Sage.

Drawbaugh, C. (1968). What’s new in teacher education in agriculture?  *Journal of the American Association of Teacher Educators in Agriculture, 9*(2), 7-10. doi: 10.5032/jaatea.1968.02007

Farber, K. (2015). *Why great teachers quit and how we might stop the exodus*. Skyhorse Publishing, Inc.

Hasselquist, L., Herndon, K., & Kitchel, T. (2017). School culture’s influence on beginning agriculture teachers’ job satisfaction and teacher self-efficacy. *Journal of Agricultural Education, 58*(1), 267-279. doi: 10.5032/jae.2017.01267

Langley, G. C., Martin, M., & Kitchel, T. (2014). Novice agriculture teachers’ general self-

efficacy and sense of community connectedness. Journal of Agricultural Education,

55(4), 1-11. doi: 10.5032/jae.2014.04001

Lemons, L. L., Brashears, T. M., Burris, S., Meyers, C., & Price, M. A. (2015). Factors contributing to attrition as reported by leavers of secondary agriculture programs. *Journal of Agricultural Education. 56*(4). 17 - 30. doi: 10.5032/jae.2015.04017

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Thousand Oaks, CA: Sage.

McKim, A. J. & Velez, J. J. (2015). Exploring the relationship between self-efficacy and career

commitment among early career agriculture teachers. *Journal of Agricultural Education,*

*56*(1), 127-140. doi: 10.5032/jae.2015.01127

Myers, B. E., Dyer, J. E., & Washburn, S. G. (2005). Problems facing beginning agriculture teachers. *Journal of Agricultural Education*, *46*(3), 47. doi: 10.5032/jae.2005.03047

Roberts, T. G., Harder, A., & Brashears, M. T. (2016). American Association for Agricultural Education national research agenda: 2016-2020. *Gainesville, FL: Department of Agricultural Education and Communication*.

Smith, A. R., Lawver, R. G., & Foster, D. D. (2017). *National Agricultural Education Supply and Demand Study, 2016 Executive Summary*. Retrieved from:http://aaaeonline.org/Resources/Documents/NS D2016Summary.pdf

Wolf, K. J. (2011). Agricultural education perceived teacher self-efficacy: A descriptive study of beginning agricultural education teachers. *Journal of Agricultural Education, 52*(2), 163-176. **doi: 10.5032/jae.2011.02163.**

Yin, R. K. (2010). *Qualitative research from start to finish*. New York, NY: The Guilford Press.

**A multicase study of the perceptions of African Agricultural and Allied Sector Entrepreneurs regarding their Entrepreneurial Training Experiences in the United States: Implications for Mentoring Relationships and Program Results**

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**Abstract**

*Describing views of 22 individuals from Kenya, South Africa, and Uganda (8 women; 14 men) regarding entrepreneurial experiences after participation in a five-week U.S. cross-cultural exchange program was the primary purpose of this study. The program was delivered by Oklahoma State University (OSU) and funded by the U.S. Department of State. The multicase investigation assessed impacts identified by Entrepreneur Fellows, especially the program’s mentoring component, on agripreneurial activities in their communities after returning home. The study’s semi-structured interviews included six research questions and related probes. Verbatim transcriptions and member checking were decisive steps taken to ensure the data’s accuracy and trustworthiness (Creswell, 2007). The Fellows’ views were expressed as 22 cases, crystallizing facets of the study’s quintain (Stake, 2006). The identification of 2,059 codes, 15 categories, and five themes reflected two interpretive frameworks, human capital theory and theory of planned behavior. Mentoring relationships was one of five significant themes that emerged as findings. Recommendations for practice include additional training of entrepreneur mentors and suggestions for facilitating quality field experiences, and ongoing entrepreneurial funding opportunities. Future research should further investigate mentor and mentee perceptions of entrepreneurial field experiences and how such may be improved.*

**Introduction/Conceptual Framework**

“The innovative, inventive, and creative activities that have brought growth, progress, and perspective to our global communities have become the impetus for every challenge that we face globally” (Andenoro, Baker, Stedman, & Pennington Weeks, 2015, p. 58). This is one premise of the 2016-2020 *National Research Agenda* of the American Association for Agricultural Education (AAAE) Research Priority 7: Addressing Complex Problems, Question 1. This priority focuses on programs and related methods that could be effective in preparing the human capital, including youth, to solve interdisciplinary, complex problems such as food security and sustainability (Andenoro et al., 2015).

Moreover, “[t]he world n[ow has the largest generation of young people in history. . . . They are part of the first generation that can end poverty and the last that can avoid the worst impacts of climate change” (United Nations [UN], n.d, para. 3). Young people are more likely to produce a greater future if they have real influence, negotiating muscle, political weight, and decent jobs (UN, n.d.). “[S]ocieties of the bottom billion can only be rescued from within. . . . [T]here are people working for change, but usually they are defeated by the powerful internal forces stacked against them. We should be *helping the heroes*” (Collier, 2007, p. 96). These *heroes* could be energized and aspiring entrepreneurs, including individuals focused on agricultural endeavors and interested in advocacy for marginalized populations such as women, youth, and individuals with disabilities (OSU Grant Proposal, 2013).

“With few exceptions, international comparative studies of entrepreneurship are rare, hampered by barriers such as the difficulty in gaining access to entrepreneurs in other countries, the expense involved, and the lack of reliable published data” (Thomas & Mueller, 2000, p. 289). The project examined here provided entrepreneurial training that created relationships with and *access to* (Thomas & Mueller, 2000) agricultural and allied sector entrepreneurs including agricultural producers, Extension educators and researchers, and business educators and entrepreneurs. As a consequence, researching the mentoring experiences of the participants after they returned home was one aim of the larger study.

Twenty-three *heroes* – called Entrepreneur Fellows (EFs) – chosen for the program, owned existing entrepreneurial enterprises or had aspirations for developing ventures mainly in the agricultural sector. EFs were provided with numerous opportunities for enhanced education and cross-cultural exchanges with U.S. citizens. More than 60 field experience providers from agricultural operations, educational entities, entrepreneurial ventures, government departments, and non-profit organizations voluntarily participated as mentors. Internships, job shadowing, and concurrent mentoring were considered essential parts of the EFs’ professional development experiences while in the United States (OSU Grant Proposal, 2013).

The conceptual framework supporting this study was human capital theory (HCT) from the viewpoint that “individuals and society derive economic benefits from investment in people” (Sweetland, 1996, p. 341). “Researcher[s] posited the Entrepreneur Fellows derived economic as well as socio-cultural benefits from the investment of U.S. educational, monetary, social, and physical resources in their personal and professional development” (Taylor, 2017, pp. 57-58).

The goals of the program were also supported by the theory of planned behavior (TPB) (Ajzen, 1991). According to the TPB, modifications to entrepreneurial behaviors caused as a result of U.S. experiences were reliant on intentions they had prior to their involvement and experiences occurring during the program. The researchers anticipated the Entrepreneur Fellows’ attitudes would be informed by the skills and knowledge they perceived learning during the program, i.e., their future perceived behavior control (Ajzen, 1991) as well as the inspiration likely to impact their future endeavors (Kuckertz & Wagner, 2009).

**Purpose/Objectives**

The purpose of this study was to describe the views of EFs regarding their entrepreneurial experiences after participation in a professional development program intended to enhance their capacity as entrepreneurs in their home countries. The study also sought to describe the EFs’ perceptions of the program’s impact, especially its mentoring component, on their entrepreneurial endeavors after returning to their communities. In addition, the unique entrepreneurial training and support needs of women and other marginalized groups comprising a portion of the Fellows’ cohort were explored.

Methods/Procedures

Purposeful steps were taken to ensure the quality of this qualitative multicase study based on protocols identified by Stake (2006), Tracy (2010), and Saldaña (2013). Face-to-face interviews with 15 EFs were completed in May of 2015. The other eight interviews were conducted in summer of 2015 using Skype and Google Hangout. Each interview was transcribed verbatim by the researcher and provided to the EFs through electronic mail with a request for their review and reporting of any changes that should be made. This communication and an additional e-mail message was sent reflecting Creswell’s (2007) *member checking* to ensure credibility and accuracy of the transcriptions.

Three main criteria guided the analysis and compilation of the data derived from the study’s individual cases: how each case was relevant to the quintain; the diversity of the cases across the general context; and how each case provided an opportunity to learn about the contexts and complexities of the quintain (Stake, 2006). In concordance with Stake (2006), “the transcriptions and codes were triangulated and then a cross-case analysis was conducted by the researcher” (p. 39). Knowledge was mobilized from each case during cross-case analysis by the researcher. This mobilization occurred first as case knowledge was acquired; second, when cases were compared and contrasted; and, finally, new knowledge was produced (Khan & VanWynsberghe, 2008) by the researcher’s development and interpretation of meaning.

Coding was performed at open, axial, and selective levels (Strauss & Corbin, 1990). Responses provided during interviews of 22 of 23 Fellows, in addition to changes provided by nine, were subjected to initial word-for-word content analysis using conventional methods resulting in coding categories directly derived from interview text data (Hsieh & Shannon, 2005). Segmenting data into groups of information and comparing such for similarities was completed next by the researcher, which reflected Creswell’s (2007) open coding process. Constantly comparing the data during coding increased the likelihood of eliminating ambiguity and identifying meaning across codes (Creswell, 2007). More codes emerged as comparison of the data continued. Related memos and additional background information were also analyzed (Creswell, 2007).

Axial coding was expedited by NVIVO to compare existing codes using search methods for both terms and key phrases which enabled recognition of the essence of the perceptions expressed by the study’s quintain. Selective coding practices were reflected in the exploration of relationships between codes and primary categories identified along with the examination of missing relationships expected to emerge (Strauss & Corbin, 1990). This entire process culminated in the distillation of five predominant themes (Creswell, 2007).

Results/Findings

Analysis of more than 235 pages of interview data resulted in identification of 15 categories that aggregated into five themes: commitment to youth development, entrepreneurial skills and concepts,mentoring relationships, new media usage integral to entrepreneurial endeavors, and financial needs. EFs provided primarily positive statements related to acquiring personal growth and enhancing their entrepreneurial aspirations. M*entoring relationships* were prominent entries in participants’ descriptions of significant experiences identified as optimal and less than optimal as related to all three types of field experiences occurring during the program, i.e., primarily one internship, combination internship and job shadowing experiences, and primarily job shadowing activities.

As representative of the quintain, one Fellow stated: “I interned with [name] of [mentor’s organization] and my experience with him shaped my thinking about what commercial agriculture should look like” (P13 Interview). In addition, an ongoing relationship was developed between Fellow #11, a diversified farmer and professional development provider for individuals with hearing disabilities, and one of his mentors:

I have been in contact with [my mentor and] with [my mentor’s organization], mostly about disabled people and we shared how we in Uganda handle issues they face. I contacted her through LinkedIn to discuss our project and challenges we were facing. She has sheep and we have been communicating about her agricultural venture also. (P11 Interview)

Another participant, a research associate for the International Potato Centre and agritourism business owner, described an ongoing relationship with his internship mentor:

I am in contact with an OSU Extension Specialist. And I still participate in the Oklahoma Extension forum every month so I can learn about their activities and the challenges they face and helping resolve them if it relates to our products. Also, I try to adopt the practices in my region. Usually it is about the challenges they are facing on all

the farms. (P21 Interview)

While not a prevalent perception, one Fellow, expressed frustration with the lack of follow through by some contacts made in the United States:

I had a lot of cards and I sent communications out to people and I shared ideas of what I thought could work out for this country and for them, but unfortunately most of them did not respond, including those in the workshops in Washington, DC. (P16 Interview).

**Recommendations/Implications**

Mentoring relationships, internship and job shadowing settings, understanding of roles, and the type and substance of communication were four critical aspects of the program’s field experiences and representative of and congruent with critical indicators of compatibility in cross-cultural pairings (Milner, Ostmeier, & Franke, 2013). Additional inquiries to explore the perceptions of program participants and their mentors about shared internship and job shadowing experiences with regard to these four indicators could be instructive for the selection of participants for similar programs in the future. Table 1 reflects recommendations for agricultural and Extension educators responsible for recruitment of and arrangements with volunteer mentors in cross-cultural exchange programs, especially those involving aspects of entrepreneurship.

Table 1

*Recommendations for Leaders of Exchange Programs Responsible for Recruitment of and Arrangements with Volunteer Entrepreneur Mentors*

|  |
| --- |
| Recruiting and selection of volunteer mentors who value global relationships prior to selection of the EFs can aid in selecting compatible program members. |
| Concentrate mentor recruitment on identifying long-term opportunities that can give the richest experiences and meet goals of both mentees and mentors. |
| After the mentor and program participant selection has taken place, develop and deliver pre-program training viewed at the same time by mentees and mentors using *new media* platforms to build common understanding, increase rapport, and decrease apprehensiveness. |
| Develop, maintain, and promote *new media* site(s) and related mobile telephone apps as a common reference center for scheduling of fellowship events, training agendas and materials, internship arrangements, emergency information, travel specifics, and institutional opportunities. Level of access could be managed for a breadth of audiences, i.e., EFs, mentors, family members, or context experts. |
| Develop and examine field experience plans with primary mentors prior to a fellowship to provide clear expectations, answer questions, and clarify arrangements and responsibilities. |
| After internships are underway, conduct onsite visits early in the experience to follow up on activities, relationships, and to adjust plans and placements, as appropriate. |
| Conduct a celebration and/or a recognition ceremony to acknowledge all participants for their contributions to the participants’ field experiences. |
| Promote internship/job shadowing activities as opportunities for local media contacts to conduct interviews, film interactions, and highlight outcomes. |
| Strategize possible alternative experiences in case something unforeseen occurs to hinder field placement plans, such as threats to biosecurity or proprietary rights issues. |

The quintain indicated overall positive impressions of follow-up provided by OSU team members during reciprocal program exchange visitations to their respective countries as well as through the use of electronic mail and telephone communication. However, some EFs voiced interests in participating in additional long-term facilitation, including ongoing mentoring, after returning to their enterprises. These interests warrant leaders of similar entrepreneurial education programs to include grant application budget requests to address such needs by seeking supplemental funding to provide the Fellows’ with ongoing mentoring after the program’s delivery funding is exhausted.

**References**

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211. Retrieved from https://scholar.google.com/scholar?hl=en&q=icek+ajzen+&btnG=&as\_sdt=1%2C37&as\_sdtp=

Andenoro, A. C., Baker, M., Stedman, N. L. P., & Pennington Weeks, P. (2016). Research Priority 7: Addressing complex problems. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds), *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication. Retrieved from http://aaaeonline.org/resources/Documents/AAAE\_National\_Research\_Agenda\_2016-2020.pdf

Collier, P. (2007). *The bottom billion: Why the poorest countries are failing and what can be done about it*. London, United Kingdom: Oxford University Press. Retrieved from https://paulbacon.files.wordpress.com/2010/10/bottom-billion1.pdf

Creswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Hsieh, H., & Shannon, S. (2005). Three approaches to qualitative content analysis.

[*Qualitative Health Research*](https://www.researchgate.net/journal/1049-7323_Qualitative_Health_Research)*15*(9), 1277-1288. doi:10.1177/1049732305276687

Khan, S., & VanWynsberghe, R. (2008, January). Cultivating the under-mined: Cross-case analysis as knowledge mobilization. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research, 9*(1). Retrieved from http://www.qualitative-research.net/index.php/fqs/article/viewArticle/334/729

Kuckertz, A., & Wagner, M. (2010). The influence of sustainability orientation on

entrepreneurial intentions -- Investigating the role of business experience. *Journal of Business Venturing*, *25*(5), 524-539. Retrieved from http://www.dge.ubi.pt/msilva/papers\_mece/paper\_4.pdf

Milner, J., Ostmeier, E., & Franke, R. (2013). Critical incidents in cross-cultural coaching: The view from German coaches. *International Journal of Evidence Based Coaching and Mentoring, 11*(2), 19. Retrieved from http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1402&context=gsbpapers

Oklahoma State University Grant Proposal. (2013). *Empowering Aspiring Entrepreneurs for Economic Success: A Professional Fellowship for Kenya, South Africa, and Uganda.* Department of Agricultural Education, Communications, and Leadership, Oklahoma State University, Stillwater.

Saldaña, J. (2013). *The coding manual for qualitative researchers* (2nd ed.). Thousand Oaks, CA: Sage.

Stake, R. E. (2006). *Multiple case study analysis*. New York, NY: Guilford.

Strauss, A. L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques.* Newbury Park, CA: Sage Publications.

Sweetland, S. (1996). Human capital theory: Foundations of a field of inquiry. *Review of Educational Research,* *66*(3), 341-359. Retrieved from http://www.jstor.org/stable/1170527

Taylor, L. (2017). *Entrepreneurial learning and mentoring: A multicase study of the experiences*

*of African entrepreneurs in Oklahoma and impacts on their business ventures*

*in Kenya, South Africa, and Uganda*. (Doctoral dissertation submitted to ProQuest April 29, 2017). Oklahoma State University, Stillwater.

Thomas, A. S., & Mueller, S. L. (2000). A case for comparative entrepreneurship: Assessing the relevance of culture. *Journal of International Business Studies*, *31*(2), 287–301. Retrieved from http://www.jstor.org/stable/155638

Tracy, S. J. (2010). Qualitative quality: Eight “big-tent” criteria for excellent qualitative research. *Qualitative Inquiry, 16*(10), 837-851. doi:10.1177/1077800410383121

United Nations. (n.d.). *Give young people decent jobs and they will create a better future-UN Chief* (Online press release)*.* Author.Retrieved from http://www.un.org/sustainabledevelopment/blog/2015/06/give-young-people-decent-jobs-and-they-will-create-a-better-future-un-chief/

**A Case for Critical Thinking: Exploring Students’ Perceptions of Multimedia Case Studies**

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*For college graduates in agriculture to communicate effectively about agricultural issues, they must be equipped with the skills necessary to analyze these topics and think critically about them. College instructors can use multimedia case studies to help students achieve the desired learning outcomes and encourage critical thinking. Using the Stage Theory of Critical Thinking Development, the purpose of this study was to explore postsecondary students’ reactions to multimedia case studies that discuss agricultural issues. The population for this study was students at two universities who were in classes that integrated five multimedia case studies. At the completion of each weeklong case study, students reflected on their experience and provided feedback regarding what they had learned. These reflections were qualitatively analyzed to address the study’s purpose. Findings indicated that students learned the most when they had some prior knowledge of the topic. If they did not have this fundamental understanding, they were not as equipped to consider broader implications. Some students demonstrated higher stages of critical thinking although additional research is necessary. Instructors are encouraged to continue implementing multimedia case studies in their classes.*

**Introduction/Literature Review**

Agriculturalists need to know how to communicate complex issues with the public (Ruth-McSwain, 2008), especially as the agriculture industry grows and changes (Alston et al., 2010). It is important students possess and use critical thinking skills in conjunction with their knowledge of agriculture (Tapper, 2004) in order to effectively communicate with audience members. Greenwood (2007) identified the need for current students to receive a 21st century education, which should emphasize technology. Edgar, Retallick, and Jones (2016) noted that students need an education with “a more personal instructional design” that “includes collaboration, communication, critical thinking, and creativity” (p. 38). To meet the learning needs of students, instructors are encouraged to find innovative ways meet their learning objectives and to help students develop necessary skills for their careers (Edgar et al., 2016). One of the pedagogical strategies could be case studies, which are used in multiple disciplines including nursing, health care, law, business, and social sciences (Popil, 2011). Defined by Erskine, Leenders, and Mauffette-Leenders (2003), a case study is a “description of an actual situation, commonly involving a decision, a challenge, an opportunity, a problem, or an issue faced by a person or persons in an organization” (p. 9). Research has shown case studies are an effective teaching method because they allow for theory application, decision making practice, consideration of multiple viewpoints, data analysis, and information synthesis (Popil, 2011).

The multimedia case study approach uses multiple methods to communicate the desired information (Mills, Durepos, Weibe, 2010) such as visual aids (pictures and videos) and written aids. The multimedia case study method is designed to allow students to obtain information and use it from different mediums and create their own critical thinking (Mills et al., 2010). Incorporating videos into case studies improves student learning and engagement because students can simulate and conceptualize a real-life case (Alberts & Stevenson, 2017). Alberts and Stevenson (2017) evaluated the effectiveness of using multimedia case studies to improve food safety behaviors. They found that the multimedia case study increased the students’ understanding of complex issues surrounding food safety. Mbarika (2003) found that multimedia instructional materials need to stimulate self-reported learning and learning interest. Wolter et al. (2012) studied the effectiveness of a program called Case It! in STEM instruction. They found that Case It! was effective in boosting student performance regardless of the teacher, institution, language, academic level, or gender of the student. They also found that using multimedia case studies allowed students to incorporate information from multiple classes in one setting.

Providing students with opportunities to develop their cognitive skills such as reasoning and problem-solving will prepare them for successful careers (Mbarika, 2003). When professors use the multimedia case study approach, they aim to equip their students with critical thinking tools so they can effectively communicate agricultural issues to the public effectively (Tapper, 2004).

**Theoretical Framework**

Paul (1990) defined critical thinking as “disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thought” (p. 4). Elder and Paul (2010) proposed the Stage Theory or Critical Thinking Development to describe how students “pass through stages of development in critical thinking” (para. 1). The six stages are as follows: 1) The Unreflective Thinker, 2) The Challenged Thinker, 3) The Beginning Thinker, 4) The Practicing Thinker, 5) The Advanced Thinker, and 6) The Accomplished Thinker. The authors noted that instructors must help students proceed through these stages in order to improve their critical thinking abilities.

McPeck (2016) noted that critical thinking always accompanies another activity or subject area, and cannot be an independent action. Therefore, numerous activities can be thought about critically, and numerous activities can elicit critical thinking (McPeck, 2016). Active learning strategies have been reported to stimulate critical thinking (Youngblood & Beitz, 2001). Thomas (2009) described a comprehensive model for effective teaching, which includes an experiential learning component. Experiential learning requires students to actively engage in and reflect on processes, allowing them to “interact in real-life contexts, to construct individual meaning, and to engage in complex actions that mirror life outside school” (p. 94). Using case studies is one effective way to implement experiential learning because they require active involvement in the learning process and promote problem-solving and decision-making skills (Popil, 2011).

**Purpose and Research Objectives**

Research Priority 4 of the American Association for Agricultural Education *2016-2020 National Research Agenda* aims to establish “meaningful, engaged learning in all environments” (Edgar et al., 2016, p. 38). The purpose of this study was to explore postsecondary students’ reactions to multimedia case studies that discuss agricultural issues. The primary research objective was to describe students’ opinions regarding awareness and knowledge about the agricultural topics presented in the case studies.

**Methods**

The population for this study was 45 students (all over 18 years old) enrolled in an agricultural communications course at Texas Tech University and Colorado State University. One course had 18 students while the other had 27. The researchers obtained Institutional Review Board approval from each university before collecting data for the study. In each of the courses, the instructors taught five, week-long multimedia case studies that addressed the following topic areas: antibiotic use in animal agriculture, water conservation in agricultural production, food recall and crisis communication, rural community resiliency, and invasive species. The instructors of these courses developed three of the five multimedia case studies used in the classes. The case studies had a variety of videos, articles, class discussion, and application activities with the goal of engaging the students in critical thinking and communication. Each case focused on using a different information source to engage the students in different ways, and allow them to think critically.

After each study was completed, students answered a series of reflection questions to gather feedback about the case studies and what students had learned from them. Students did not put their names on these reflection papers so the information could not be connected to any individual student. To analyze the data, three researchers read the students’ feedback and identified comments that included the student’s reference to awareness and knowledge of the case studies along with any mention of how they processed the new information received. The data were then analyzed using the constant comparative method to identify emergent themes.

**Findings**

Reflections from the “Antibiotics in Animal Agriculture” case study indicated students were aware of the issue, but they did not fully understand the concepts. One student said: “My initial thoughts were that I really don’t know that much about antibiotic use in animal agriculture. As an agriculturalist, I would like to say I know more about this topic than the average person, but this case study made me realize that there was a lot I did not know.” Another said, “Not only had I never considered the effects of antibiotics on the meat product itself, if I would have I think I would have assumed what others also thought – that the antibiotics went directly into the food and we consumed them.”

The case study allowed them to question their previous knowledge and gain a better understanding of the controversial topic. A student commented: “Antibiotics in animal agriculture was something that I thought I had some knowledge in, but as it turns out, was a little misinformed. Through this case study, I learned a great deal on hard facts on the topic, as well as great opinions and ideas from my peers. This study certainly has given me more confidence on the subject.”

The case study helped them gain more knowledge about the subject and how to talk about it in a productive way. A student said: “I learned so much. I feel I could confidently have a conversation with others on this topic or informing the misinformed or uneducated.”

The reactions from the “Crisis Communication” case study were different between the two areas based on the geographic location of the food recall brand. Students at Colorado State University were not familiar with the issue, but they were able to connect the topic to other examples of contemporary crisis communication situations. While students at Texas Tech University were aware of the issue, they did not know much about how the company had handled the recall. “It was nice to learn about how to deal with a crisis and to be able to use a real-life example that we were all impacted by,” one student said.

The “Invasive Species” case study introduced many students to the issue of citrus greening, which is devastating the citrus crop in Florida. Overall, students had no previous knowledge of citrus greening or citrus production, so many commented on the value of the videos showing them what it looks like. “I believe it was very informative and that more people need to see it and understand it. It was cool to see everything they are trying to do to prevent,” a student commented.

Students recognized that even though they did not see how the issue relates to their geographic area, as communicators, they would need to how to handle a variety of issues. They act as primary source of information for consumers so they need to be equipped to know about a range of topic areas. A student wrote: “I thought the idea that GMO’s might be the only answer but consumers might not allow it was extremely provoking. Is the implementation of scientific innovation so bound by public acceptance in every industry, or is the agriculture industry’s barrier of consumer concern unique?”

Students in Colorado seemed to struggle to draw connections to the content in the “Rural Community Resiliency” case study because it was based in another state. Students in Texas could relate the issue to their local communities to foster critical thought. All the students noted they were unfamiliar with the case’s content, but it did encourage some interest in the broader topic area. One wrote: “I had never considered how rural communities respond to disasters. Because I lived in a rural, resource-dependent community, I was interested in the results of this study.”

In the “Water Conservation” case study, critical thinking was demonstrated in students’ comments about considering barriers to behavior change, which was made concrete from an in-class demonstration of making the students change seats. They also expressed that the case study helped them consider multiple perspectives on water conservation. One wrote: “It stood out to me how hard a new behavior like this would be to sell. The barriers are huge, in my view.” Another commented that seeing the issue from multiple perspectives helped clarify the challenges to addressing behavior change. “I liked learning about both sides to this particular situation the best. I can so often point fingers at individuals who do the most sustainable actions, however, although the case study made it clear this was a pressing issue, it gave me an idea of what the farmers are going through.”

Some students noted how their assumptions about water conservation changed as they progressed through the case study. A student wrote: “Initially, I felt I might not enjoy this study because I don’t have a desire to work in water conservation. I soon realized how this subject affected all of us on a much larger scale.”

**Conclusions, Discussion & Recommendations**

Previous authors (Mills et al, 2010; Popil, 2011) have stated multimedia case studies can be used to address the need to provide “meaningful, engaged learning in all environments” (Edgar et al., 2016, p. 38). In the current study, the amount of prior awareness of the topic seemed to influence the amount of critical thinking students evidenced. If they had never heard of the topic or issue, they noted that the topic was more novel or unique. However, if they had more background information, their comments indicated more reactions to deeper levels of the issue and critiques of the actions taken.

Because instructors need to take an active role in helping students assess their own thinking and develop their critical skills (Elder & Paul, 2010), college instructors should implement strategies to help students progress through the stages of critical thinking. Unreflective thinkers are those who “lack the ability to explicitly assess their thinking and improve it thereby” (para. 10). It appears some of the students in the current study were still in this stage regarding their critical thinking skills because they admitted they were unaware of the agricultural issues presented and some said they did not see how they were relevant based on geographic region.

Being able to recognize one’s assumptions and points of view marks a students’ progression to second stage, Challenged Thinkers (Elder & Paul, 2010). Some of the students in this study appeared to be in this stage because they noted how their preconceptions, biases, and prior knowledge may have influenced their overall opinions and judgements of the issues presented.

Moving beyond this stage to the third stage, Beginner Thinker, requires students to recognize “basic problems in their thinking and make initial attempts to better understand how they can take charge of and improve it” (Elder & Paul, 2010, para. 20). Students in this stage begin to change some of the thinking but do not proceed with an established plan. Based on the student feedback, it seems this was the highest level of critical thinking development observed in this study. The type of reflection activities used in these classes limits our ability to draw concrete conclusions regarding where students may be in terms of their critical thinking stage. The responses to reflection questions were brief and did not encourage elicitation of thoughts. One recommendation for future practice is to encourage students to consider their thinking as it relates to each case study in a more instructor-guided fashion. This would improve the practice and provide more complete data for subsequent data analysis. Another area of research is to pair the student’s critical thinking score (measured via a quantitative instrument) at the beginning and end of the course to how their written reflections may have evolved. This would provide a more complete picture regarding how the case studies are impacting critical thinking skills.

Overall, it seemed the multimedia case studies did encourage students to think critically about the topics, although some students indicated being better able to do so. Instructors should continue to integrate these case studies in their classes and equip students to become problem solvers and decision makers regarding the complex issues facing the agriculture industry.

**References**

Alston, J., Andersen, M., James, J., & Pardey, P. (2010). *Persistence pays: U.S. agricultural productivity growth and the benefits from public R&D spending*. New York: Springer.

Alberts, C.M., & Stevenson, C.D. (2017). Development of a reality-based multimedia case study teaching method and its effect on students’ planned food safety behaviors. Journal of Food Science Education, 16, 10-18. doi: 10.1111/1541-4329.12095

Edgar, D.W., Retallick, M.S., & Jones, D. (2016). Research priority 4: Meaningful, engaged learning in all environments (p. 37). In Roberts, T.G., Harder, A., & Brashears, M.T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

Elder, L., & Paul, R. (2010). Critical thinking development: A stage theory. Retrieved from http://www.criticalthinking.org/pages/critical-thinking-development-a-stage-theory/483

Erskine, J.A., Leenders, M.R., & Mauffette-Leenders, L.A. (2003). *Teaching with cases* (3rd ed.). London, Ontario: Ivey Publishing.

Greenwood, K. (2007). *Learning in the 21st century: A national report of online learning.* Retrieved from http://www.blackboard.com/resources/k12/ k-12\_learning\_in\_the\_21st\_century.pdf

Mbarika, V.W.A. (2003). Using a multimedia case study approach to communicate information technology concepts at the graduate level - the impact of learning driven constructs. *Journal of STEM Education: Innovations and Research, 4*(1/2), 28-36.

McPeck, J. E. (2016). *Critical thinking and education (Routledge library editions: philosophy of education* (3rd ed.). London: Routledge.

Mills, A. J., Durepos, G., & Wiebe, E. (Eds.). (2010). *Encyclopedia of case study research: L-Z Index* (1) 580-582. Thousand Oaks: Sage.

Paul, R. W. (1990). Critical thinking: What, shy, and how. In A. J. A. Binker (Ed.), *Critical thinking: What every person needs to survive in a rapidly changing world (pp. 45-56)*. Retrieved from http://assets00.grou.ps/0F2E3C/wysiwyg\_files/FilesModule/criticalthinkingandwriting/20090921185639-uxlhmlnvedpammxrz/CritThink1.pdf

Popil, Inna. (2011). Promotion of critical thinking by using case studies as teaching method. *Nurse Education Today*, *31*(2) 204 - 207). doi: 10.1016/j.nedt.2010.06.002

Ruth-McSwain, A. (2008). Penchant for print: media strategies in communicating agriculture information. *Journal of Applied Communications*, 92(3-4).

Tapper, J. (2004). Student perceptions of how critical thinking is embedded in a degree program.   
 *Higher Education Research & Development, 23*(2) 199-222. doi:   
 10.1080/0729436042000206663

Thomas, L. (2009). From experience to meaning: The critical skills program. *Phi Delta Kappa*, *91*(2), 93-96. Retrieved from https://www.antioch.edu/new-england/wp-content/uploads/sites/6/2017/01/CriticalSkillsbyLThomas.pdf

Wolter, B.H.K., Lundeberg, M.A., Bergland, M., Klyczek, K., Tosado, R., Toro, A., & White, D. (2012). Student performance in a multimedia case-study environment. *Journal of Science Education & Technology*, *22*(2), 215-225. doi: 10.1007/s10956-012-9387-7

Youngblood, N., & Beitz, J.M. (2001). Developing critical thinking with active learning strategies. *Nurse Educator*, *26*, 39-42.